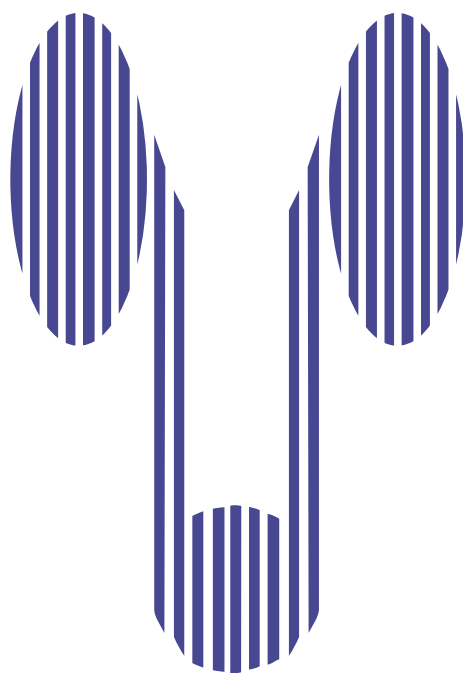


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EDITOR'S COMMENT

The May – June 2004 issue of the International Braz J Urol presents interesting contributions and as usual the Editor's Comment will be close to the list of contents and will highlight some important papers.

Doctors Rafique and Javed, from Instar Medical College, Pakistan, presented on page 185 a paper on the role of intravenous urography and transabdominal ultrasonography in the diagnosis of bladder carcinoma in patients presenting painless hematuria. The authors found that ultrasonography was significantly more sensitive (96%) in the detection of bladder carcinoma compared to urography (87%). The authors recommended the use of ultrasonography as the initial radiological investigation for detection of bladder carcinomas in patients presenting hematuria. Doctor William H. Bush, Director of Genitourinary Radiology at University of Washington Medical Center, Seattle, USA, provided an important editorial comment on this article.

Doctor Vilar and co-workers, from Federal University of Pernambuco, Brazil, presented on page 237 an investigative paper on total bladder replacement with de-epithelialized ileum in dogs. Since one of the most important problems with this kind of procedure is graft retraction, the authors analyzed the value of a silicone modeler inside the neobladder for preventing such a retraction. The authors found a significant statistically difference on bladder capacity between the groups with and without the use of a silicone modeler and concluded that the intravesical modeler prevented the retraction of the neobladder of de-epithelialized ileum.

Doctors Mariano and Teffili, from Porto Alegre, Brazil, presented on page 192 a somewhat controversial paper on laparoscopic partial cystectomy for treating bladder carcinoma. The authors studied a selected group of 6 patients and performed laparoscopic partial cystectomy with lymphadenectomy. The resection margins, as well as lymph nodes, were free of neoplasia. In a mean follow-up of 30 months, one patient developed local and metastatic disease. The authors concluded that laparoscopic partial cystectomy could be an alternative surgical method for treating selected cases of patients with transitional cell carcinoma of the bladder. Although their initial results are optimistic, we must remember the risk of tumor implantation with such a procedure.

Doctor Bezerra and colleagues, from ABC Medical School, Brazil, presented on page 230 a comparative analysis between open and laparoscopic Burch surgery. The authors found that the efficacy of both methods is similar, and, in addition, they did not find statistically significant advantages of laparoscopic surgery over open surgery, concerning recovery in the immediate postoperative period.

EDITOR'S COMMENT - continued

Doctor Claro and co-workers, from Federal University of São Paulo, Brazil, published on page 199 a paper on the efficacy and safety of the association of high dose vitamin E and extracorporeal shock wave therapy as a non-invasive treatment for Peyronie's disease. Interestingly, the authors found that this association represents a good option for treatment of the penile deformity. Doctor Wolfgang Weidner, Director of Urology at Justus Liebig University Giessen, Germany, a world expert in this topic, provided an important editorial comment on this article.

Dr. Francisco J.B. Sampaio
Editor-in-Chief

ROLE OF INTRAVENOUS UROGRAPHY AND TRANSABDOMINAL ULTRASONOGRAPHY IN THE DIAGNOSIS OF BLADDER CARCINOMA

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ABSTRACT

Introduction: The present study was carried out to compare the efficacy of transabdominal ultrasonography and intravenous urography in the diagnosis of bladder carcinoma in those patients presenting painless hematuria.

Materials and Methods: Medical records of 100 patients who had both ultrasonography and intravenous urography were studied. The reported findings of these investigations were correlated with those of cystoscopy.

Results: Ultrasonography was significantly more sensitive (96%) in the detection of bladder carcinoma compared to urography (87%). By applying the test of equality of proportions, the value of Z is 2.28, which is statistically significant ($p < 0.01$). In addition, ultrasonography was more sensitive in clarifying the pathology in upper renal tracts i.e. ureteric obstruction secondary to bladder carcinoma when urography failed due to none or poor excretion of contrast.

Comments: We recommend the use of ultrasonography as the initial radiological investigation for detection of bladder carcinomas in patients presenting hematuria. Ultrasonography is safe, easily available, cost effective and provides images of both upper and lower renal tract. Patients diagnosed to be suffering from bladder carcinoma by ultrasonography should be scheduled directly and promptly for cystoscopy and bladder tumor resection.

Key words: bladder; bladder neoplasms; ultrasonography; intravenous urography
Int Braz J Urol. 2004; 30: 185-191

INTRODUCTION

Bladder cancer is a disease of significant concern. In Europe (1) and USA (2) it is the fourth most common cancer in men. In Pakistan, it is one of the top ten common cancers in men and is the most common urological malignancy. The majority of patients present painless hematuria, usually as the sole presenting symptom (3). It has been the standard urological practice to request an intravenous urogram as the initial radiological investigation of patients with hematuria. Various authors have reported on the use of transabdominal ultrasonography as the initial radiological investigation for detection of bladder carcinomas in patients presenting hematuria (4-6).

Ultrasonography is safe and easily available and provides images of both upper and lower renal tract. Confirmation of the bladder carcinoma requires cystoscopy and histopathological diagnosis of the resected tumor tissue.

The present study was carried out in the departments of Urology and Oncology of Nishtar Medical College Hospital, Multan, to compare the efficacy of urography and ultrasonography in the diagnosis of bladder carcinoma.

MATERIALS AND METHODS

In this case controlled retrospective study medical records of 122 patients who presented

painless hematuria secondary to bladder carcinoma from January 2001 to June 2003 were evaluated. Only those patients who had both ultrasonography of urinary tract and urography were included in the study. A hundred patients satisfied this criterion. Those patients who had only one investigation i.e. urinary tract ultrasonography or urography and those who had hematuria secondary to any other pathology like urinary tract stones, renal carcinoma etc. were excluded from the study. Urinary tract ultrasonography and urography were performed by different duty consultant radiologists. Ultrasonography was performed with Toshiba just vision and Toshiba Capasi machines available in the radiology department. All patients had renal tract and abdominal ultrasound examination performed with full bladder. The bladder was examined with transverse and vertical probes. Scanning was performed both pre and post micturition. Urography was carried out following empiric bowel preparation and included plain KUB X-ray and 5 min, 15 min, 30 min and post void films. It was done without tomography.

All patients underwent cystoscopy and transurethral resection of bladder carcinoma. Confirmation of the bladder carcinoma was achieved by histopathological examination of the submitted tumor in each case.

In all cases the reported findings of urinary tract ultrasonography and urography were correlated with those at cystoscopy.

RESULTS

The patient's age ranged from 18 years to 85 years (average 55 years). Male to female ratio was 4:1. Thirty seven patients had superficial and 63 patients had invasive bladder carcinoma. In 87 (87%) patients urography accurately diagnosed the bladder carcinoma. In 13 patients urography failed to suggest the diagnosis due to various reasons (Table-1). In 86 patients there was no abnormality in the upper urinary tracts while in 14 patients various findings were reported. There was unilateral non-excretion of contrast in 3 patients with history of previous nephrectomy. In 2 patients there was good unilateral excretion but only

Table 1 – Failure of urography to detect bladder carcinoma (n = 13).

Clots in bladder	3
Poor excretion of contrast	1
Small tumors	6
Anterior wall tumor	1
Small capacity bladder	1
Deformed bladder	1

contralateral nephrogram. In 9 patients there was non-excretion of contrast on one side. On the other hand urinary tract ultrasonography detected the bladder carcinoma in 96 (96%) patients. In addition, ultrasonography accurately determined the size, location and multiplicity of bladder carcinomas. Ultrasonography failed to detect bladder carcinoma in 4 patients (Table-2). In 3 patients bladder carcinoma was missed on ultrasonography, all these tumors were small and less than 0.5 cm. In one patient, the radiologist failed to detect a 3.5 cm bladder carcinoma and reported it as a vesical stone. In all those cases when urography failed to provide information about the upper urinary tract, ultrasonography accurately defined the pathology. In 3 patients there was unilateral absence of kidneys and in 11 patients there was hydronephrosis and hydroureter secondary to ureteric involvement by bladder carcinoma.

Smaller tumors detected on ultrasonography are shown in Figures-1 and 2 while smallest tumors detected on urography are shown in Figures-3 and 4.

The data show that the proportion of the correctly detected bladder carcinoma by ultrasonography is higher (0.96) than this proportion by urography (0.87). For testing of this hypothesis we applied the test of equality of 2 proportions. The value of Z is 2.28, which is statistically significant ($p < 0.01$).

Table 2 – Failure of ultrasonography to detect bladder carcinoma (n = 4).

Small tumors	3
Tumor falsely reported as vesical stone	1

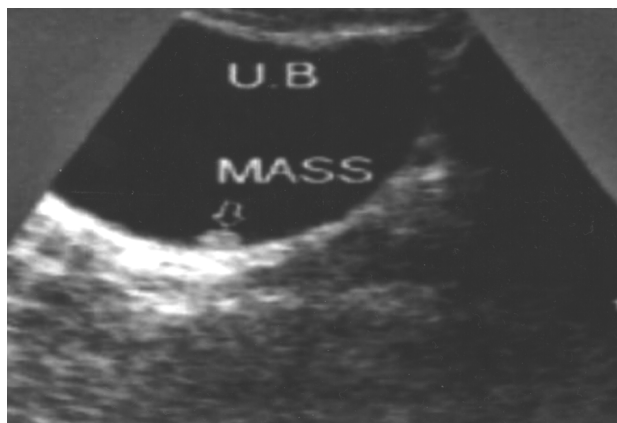


Figure 1 – A small tumor 0.9 x 0.6 cm in left posterolateral wall of urinary bladder.

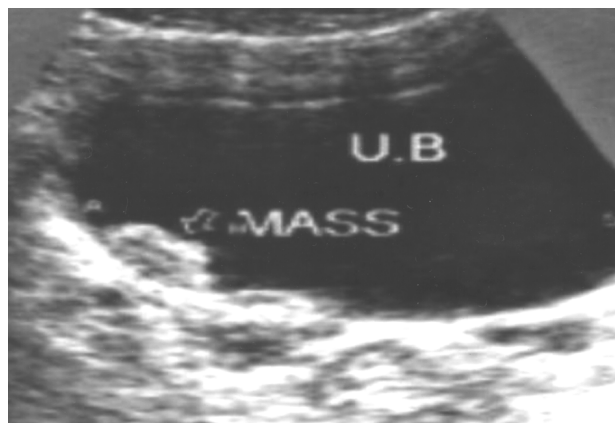


Figure 2 – A tumor 1.8 x 1.4 cm in left posterolateral wall of urinary bladder.



Figure 3 – An intravenous urogram showing a small papillary tumor as filling defect in the right lateral wall of urinary bladder.



Figure 4 – An intravenous urogram showing a small solid tumor as filling defect in the right lateral wall of urinary bladder.

DISCUSSION

The standard initial investigations most useful for patients presenting painless hematuria secondary to bladder carcinoma include urine microscopy, urine cytology, intravenous urography and ultrasonography.

The traditional initial radiological investigation has been intravenous urography. Useful information about the primary bladder carcinoma can be obtained from urography (7). Scrupulous technique is required to eliminate artifacts caused by under-filling or external compression (8). Large tumors appear as filling defects in the bladder on cystogram phase of urogram. Small tumors may not be seen on urography as they are lost in the contrast medium in full bladder and in postvoid films it may be difficult to recognize them as the urothelium of collapsed bladder adopts a corrugated configuration. Tumors within a bladder diverticulum may not be seen on urography (9). Urography has its own risks. It exposes the patient to a small risk of ionizing radiation, equivalent to a 0.1% incidence of radiation induced carcinoma (10) and contrast induced renal failure has been reported in 0.8% of patients without preexisting renal disease (11). In addition, severe adverse reactions occur in 0.22% of the ionic and 0.04% of the non-ionic contrast media examinations (12).

The reported detection rates of bladder carcinomas by urography range from 26% to 86% (8,9). In addition authors vary in their confidence in detecting small carcinomas, quoting values of 0.5-1 cm as their lower limit of sensitivity (5,7,9).

In the present study 87% bladder carcinomas were detected at urography and the size of the smallest tumors detected at urography was 1.5 cm.

Urography as the standard investigation has been increasingly criticized over recent years, since the widespread introduction of ultrasonography. Technological improvements in ultrasound equipment have brought the diagnostic accuracy of this examination even superior to urography. Ultrasound depicts the bladder carcinoma as a soft tissue structure of low to intermediate echotexture projecting in to the filled urinary bladder lumen (13). The extent of invasion of bladder wall can be assessed with

ultrasound. The echogenic line around the bladder is absent when a tumor has invaded the bladder wall (14). Transabdominal ultrasonography is a simple and quick investigation. It requires no special preparation and is not associated with any complication inherent to urography. It can safely be performed in elderly patients and those with renal failure.

Factors that affect the detection of bladder carcinoma include the operator's skill, obesity of patient and degree of bladder distension (15). Accurate detection also depends on the size and location of tumor. Tumors smaller than 0.5 cm can be difficult to detect (16) and tumors located in the bladder neck and dome can also be missed on sonography (17).

Regardless of the location and size, sonographic detection rates of bladder carcinoma range from 82% to 95% (16,17). In the present study the sonography detected 96% bladder carcinomas and the smallest carcinoma detected was 0.8 cm in size.

The major argument in favor of retaining the urography as the initial investigation is the exclusion of synchronous multifocal urothelial carcinoma in the upper urinary tract (18). Ultrasonography, however, is at a disadvantage compared with urography in that normal ureter is not identified and anatomical detail obtained of the renal pelvis is inferior.

Urothelial tumors of the upper renal tract are rare compared with bladder tumors and most ureteric tumors present upper tract dilatation, which would be identified by ultrasonography (19). In the present study no synchronous upper renal tract tumor was found. The other argument in favor of urography is that it can detect the ureteral dilatation caused by the muscle invasive bladder carcinoma (18). However, ureteric dilatation can be documented equally well by sonography (5). Because of the poor or non-excretion of contrast, urography failed to depict the pathology of the affected upper renal tracts in 14 patients. Ultrasonography accurately defined the pathology in all such cases. In 3 patients no kidney was present because of previous nephrectomy and in others there was ureteric dilatation secondary to involvement of distal ureters by invasive bladder carcinomas.

In the present study ultrasonography was superior (96%) to urography (87%) in the detection

of bladder carcinoma. By applying the test of equality of proportions the value of Z is 2.28, which is statistically significant ($p < 0.01$).

We recommend the utilization of ultrasonography as the initial radiological investigation for detection of bladder carcinomas in patients presenting with hematuria.

Ultrasonography is safe, easily available, cost effective and provides images of both upper and lower renal tract. We present a flow diagram (Figure-5) that will be helpful in investigating patients presenting with hematuria of suspected bladder carcinoma origin. It is hoped that by employing ultrasonography as primary imaging modality in patients with hematuria

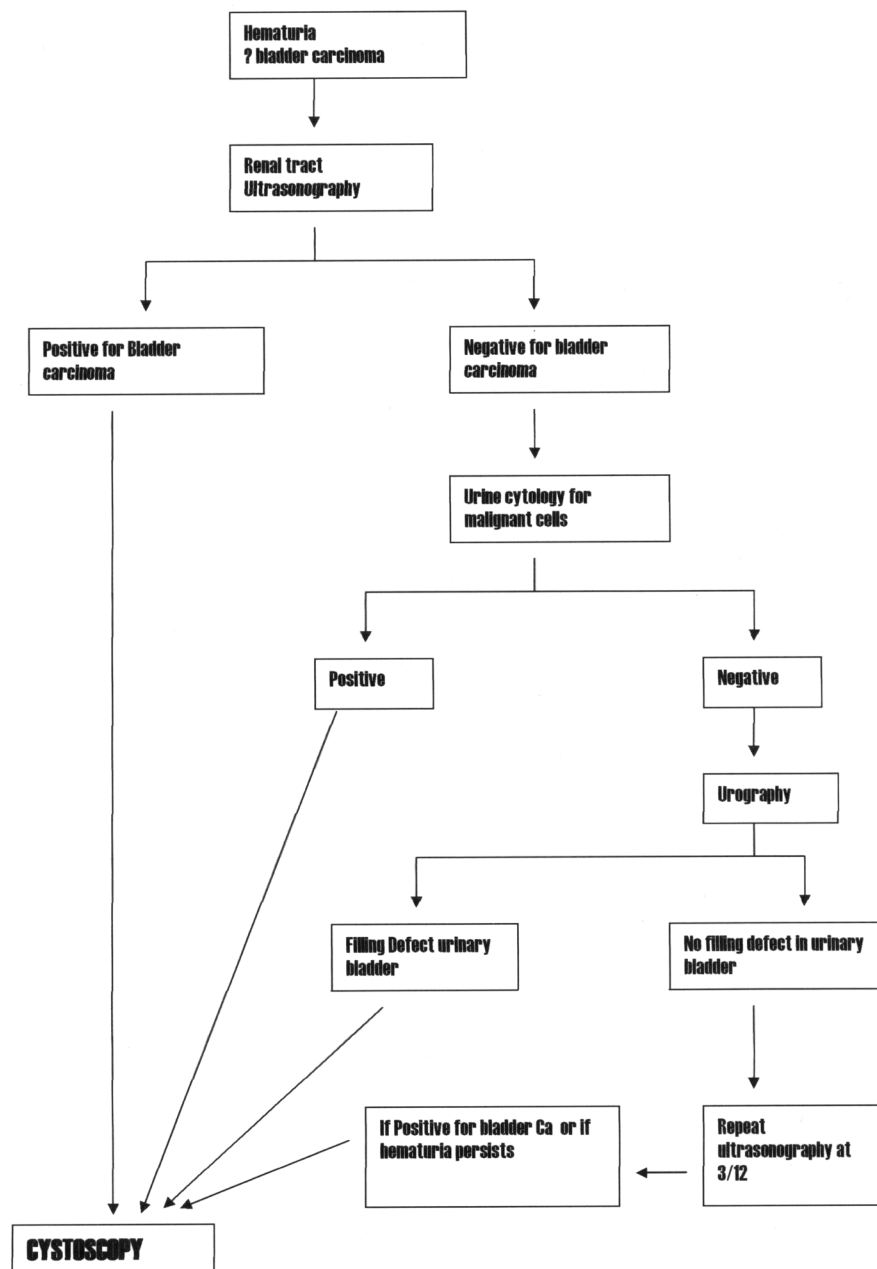


Figure 5 – Flow diagram for investigation of patients presenting with hematuria of suspected bladder carcinoma origin.

more new cases of bladder carcinoma will be detected especially in developing countries where ultrasonography is easily available compared with urography. Patients diagnosed to be suffering from bladder carcinoma by ultrasonography should be scheduled directly and promptly for cystoscopy and bladder tumor resection.

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EDITORIAL COMMENT

In this study, ultrasonography was effective in showing obstruction and involvement of the lower ureter by the bladder tumor. Ultrasonography does not adequately evaluate the mid or upper ureter or the upper collecting system and calices.

Regarding excretory urography; it is not, in most urologist's opinion, an adequate examination for bladder carcinoma, and most will add the caveat of "cystoscopy is necessary to adequately evaluate the bladder for tumor" or something to that effect. The intravenous urography, done well (i.e. with nephrotomography), does provide excellent evaluation of the ureters and upper collecting system and that is its role; it thereby precludes the need for retrograde ureteropyelography either at the time of cystoscopy or later if the cystoscopy is negative.

But, in many countries, this approach of ultrasonography as the initial evaluation of patients with hematuria and suspected bladder cancers makes considerable sense as optimizing provision of health care, recognizing the limitations of ultrasonography

and the need for a process so that patients with a "negative" ultrasonography do not escape adequate evaluation and followup.

In many countries where computed tomography (CT) scanning is readily available, the CT-urogram (multi-phase CT with noncontrast of abdomen and pelvis for calculi, nephrogram phase of the kidneys, and delayed imaging of the kidneys and ureters) is becoming the gold standard in evaluating patients suspected of having "surgical" hematuria not due to simple stone disease. However, this "high-tech" approach has disadvantages, i.e. higher radiation dose, high cost and impact on health care costs and, of course, availability.

Regarding the evaluation of bladder cancer, it is my impression that cystoscopy and biopsy is the gold standard. Newer magnetic resonance imaging techniques may ultimately be helpful, but confirmation of efficacy is still in progress.

The paper presents a nice flow diagram of patient management.

Dr. William H. Bush, Jr.

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LAPAROSCOPIC PARTIAL CYSTECTOMY IN BLADDER CANCER – INITIAL EXPERIENCE

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ABSTRACT

Proposal: The authors present their initial experience with a selected group of patients who underwent laparoscopic partial cystectomy for treating bladder cancer.

Materials and Methods: In the period from June 1997 to April 2000, 6 patients, aged between 38 and 76 years, having transitional cell carcinoma of the bladder, were identified as candidates to partial cystectomy. The procedure employed consisted in laparoscopic partial cystectomy and lymphadenectomy with exclusive intracorporeal suture technique.

Results: The proposed procedure was completed in all cases. Mean surgical time was 205 minutes and mean blood loss was 200 mL. There were no significant complications during both intra- and post-operative period. Two patients (33%) presented urinary extravasation of less than 50 mL, with spontaneous resolution. Mean hospitalization period was 4 days (2 to 6). The histological analysis of the resected specimens revealed transitional cell carcinoma, stage pT1G3 in case 1, pT2aG2 in cases 2 to 4, pT2bG2 in case 5 and pT3aG3 in case 6. The resection margins, as well as lymph nodes, were free of neoplasia. One patient developed local and metastatic disease, and was treated with salvage chemotherapy. No other case of local or systemic recurrence was observed with a mean follow-up of 30 months.

Conclusions: Laparoscopic partial cystectomy can be an alternative surgical method for treating selected cases of patients with transitional cell carcinoma of the bladder.

Key words: bladder neoplasms; carcinoma; cystectomy; laparoscopy

Int Braz J Urol. 2004; 30: 192-8

INTRODUCTION

Radical cystectomy is the most effective therapy for patients with bladder cancer and remains as the treatment of choice for muscle-invasive disease (1). The success of laparoscopy in the most diverse urological procedures led to its employment in complex pelvic surgeries and in the treatment of bladder cancer (2-5). In selected patients having bladder carcinoma, open partial cystectomy can be performed with similar results and lower morbidity when compared with series of radical cystectomy (6,7).

We report here our initial experience with a selected group of patients with transitional cell carcinoma of the bladder who were treated with laparoscopic partial cystectomy.

MATERIALS AND METHODS

During the period from June 1997 to April 2000, 6 patients aged between 38 and 76 years, having transitional cell carcinoma of the bladder, were identified as candidates to partial cystectomy.

All cases underwent a throughout clinical assessment and radiological and endoscopic examinations for staging the neoplasia. The location, tumor mobility and histological type with grade of invasion were determined by endoscopic assessment, bimanual examination under anesthesia and resection and/or biopsies material, respectively. The staging system adopted in our work was the TNM as proposed by the American Joint Committee on Cancer (AJCC) (8). None of the patients who underwent laparoscopic partial cystectomy presented evidences of extravesical or systemic tumoral involvement at the time of surgery neither had undergone any form of neoadjuvant treatment.

Classic partial cystectomy is contra-indicated in patients with multiple vesical tumors, in the presence of in situ carcinoma, or with tumors involving the bladder neck or the posterior urethra. The selection criteria for laparoscopic partial cystectomy were: single invasive bladder neoplasia located far from the bladder neck or trigone, with no evidence of tumor in other vesical locations according to randomized biopsies, especially in situ carcinoma; bladder with good capacity, with the possibility of obtaining a tumor-free margin of 1,5 to 2 cm; absence of recent history of superficial tumors; and patients with tumors in bladder diverticula.

SURGICAL TECHNIQUE

The surgical preparation for the laparoscopic partial cystectomy is similar to that of open surgery, including the use of mild laxatives for colon hygiene and admission on the day of procedure, with an 8-hour fasting. Crossed testes and blood reservation are routinely performed. All patients receive antibiotic prophylaxis that is started at the moment of anesthetic induction. The procedure is performed under general anesthesia with orotracheal intubation and insertion of vesical and nasogastric catheters, with the latter being removed at the end of the surgery. Ureteral catheterization for eventual identification and/or protection of ureters is performed whenever the lesion is too close to the ureteral meatus.

With the patient under general anesthesia and in Trendelenburg position, the transperitoneal ap-

proached is made with 5 ports, similarly to the technique described for laparoscopic radical prostatectomy (4,9). A 10/11 mm trocar is inserted at the level of the umbilical scar and the 0-grade optics is then inserted for reviewing the cavity and inserting the other ports under direct view (Figure-1). The trocars are arranged in the shape of an inverted V, with the vertex at the umbilicus level for the optics, other 2, measuring 10/11 mm, placed adjacent and below the camera for the working forceps and ultrasonic scalpel, respectively, and another 2, measuring 5 mm, laterally close to the antero-superior iliac spine for the aspirator and the auxiliary clamp forceps.

Pelvic lymphadenectomy is performed from the bifurcation of the common iliac vessels following the external and internal iliac vessels along their full length, having the genitofemoral nerve as the lateral limit (4). The empty bladder is posteriorly dissected with the incision of the peritoneum adjacent to the Douglas' cul-de-sac, and is also completely released from the anterior abdominal wall, thus allowing access to the retropubic space. The bladder should be widely mobilized in order to provide enough wall dimensions for the safety margins and vesical closure without tension. A small cystotomy is performed on the bladder dome aiming to inspect the tumor area inside the bladder. Once it is open, while keeping the urethral stent clamped, the bladder rapidly distends with gas, which makes the inspection easier (Figures-2 and 3). The ultrasonic scalpel is used for peritumoral dissection with a safety margin measuring at least 1.5 to 2 cm of apparently normal vesical tissue (Figure-4).

After the tumor is resected, the extraction pouch is inserted and the specimen is placed inside it, being routinely placed in the right iliac fossa for subsequent removal. Freezing biopsies are obtained from the bladder margins and, if negative, closure is performed with continuous suture in 2 separate planes of mucosa and musculature, totally intracorporeal with absorbable 3-0 polyglactine suture (Figures 5 and 6). A vesical catheter is kept inside the bladder and a tubular drain is left in the vesical bed, being exteriorized by one of the orifices in the lateral trocars. The vesical catheter is maintained for 7 to 10 days and the tubular drain is removed as soon as it drains less than 50 mL in 24 hours.

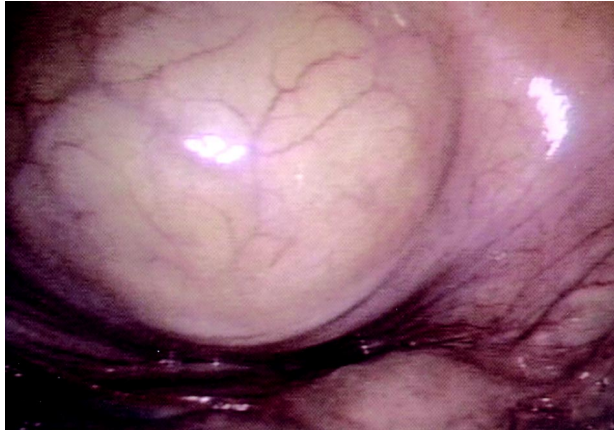


Figure 1 – Initial laparoscopic viewing of the bladder following umbilical puncture (0-grade optics).

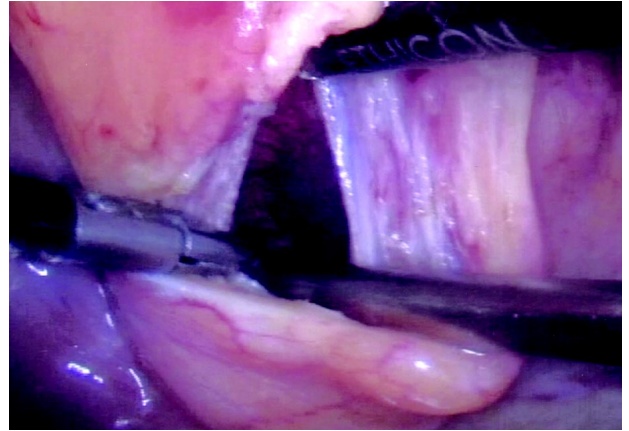


Figure 2 – Cystotomy for intravesical inspection with optics. Note that the bladder is distended by gas, since the Foley catheter is clamped, making this surgical step easier.

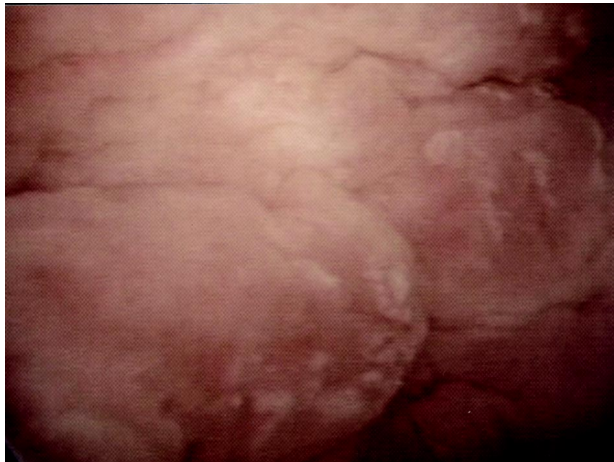


Figure 3 – Laparoscopic view of the tumor area to be resected.

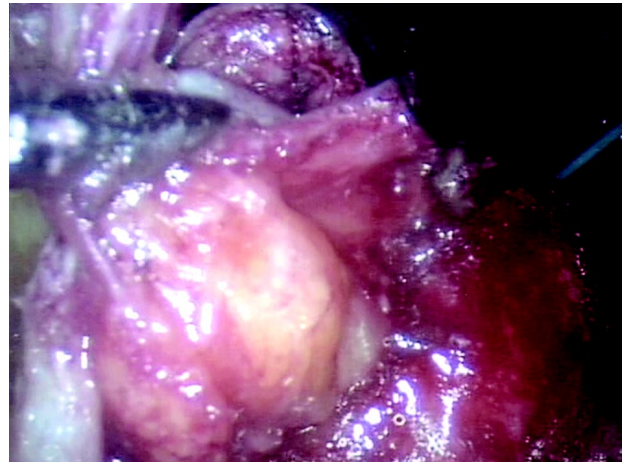


Figure 4 – Technical transoperative detail of laparoscopic partial cystectomy.

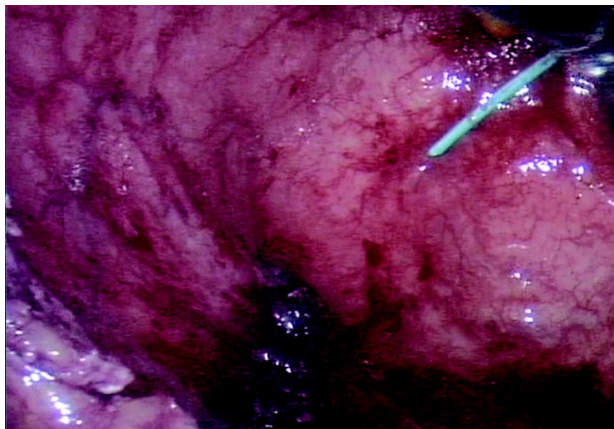


Figure 5 – Final aspect of the resected area closed in 2 planes with intracorporeal continuous suture.

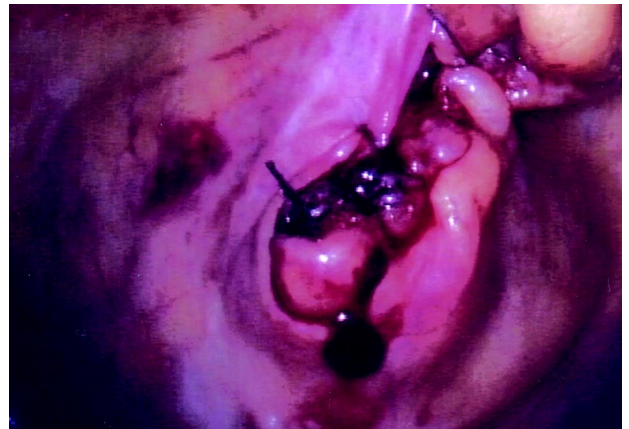


Figure 6 – Final aspect of cystotomy closure.

In the first 2 years, the patients in this series were followed by cystoscopy and urinary cytology every 3 months and by pelvic and abdominal computerized tomography and chest radiography every 6 months. If there were no signs of local or systemic recurrence after this period, the exams above were repeated, respectively, semestraly and yearly.

RESULTS

General data relative to patients is listed in Tables 1 and 2. All 6 procedures were completed by laparoscopically without transoperative complications. Sugical time ranged from 150 to 260 minutes (mean = 205 minutes), with blood loss estimated between 100 and 300 mL (mean = 200 mL). Mean hospitalization time was 4 days; 3 patients were released from hospital up to the third post-operative day, 1 was released on the fourth day, and 2 patients remained in hospital until the sixth post-operative day due to urinary drainage by tubular drain of up to 50 mL.

The histological examination of the resected specimens revealed stage pT1G3 in case 1, pT2aG2 in cases 2 to 4, pT2bG2 in case 5 and pT3aG3 in case 6. Lymph nodes and resection margins were free from neoplasia.

All patients remained continent and with normal renal function. With a mean follow-up of 30 months (12 to 50 months) no local or vesical recurrence was detected in 5 patients. One patient presented local-regional disease and metastases in bone and liver after 9 months of follow-up, and was treated with salvage chemotherapy.

DISCUSSION

Some studies have demonstrated that laparoscopic radical cystectomy is feasible, involving lower morbidity, a quicker return of the patient to his/her daily activities and a shorter hospitalization period (3,4,7,10). Other technical advantages with the method include non-performance of laparotomy, re-

Table 1 – Patients' data.

Patient	Age	Gender	Clinical stage	Pathology	Complication	Follow-up
1	76	M	Diverticulum	T1G3N0 / CaT	urinary drainage	12 months
2	38	F	T2N0M0	T2aG2N0 / CaT	urinary drainage	15 months
3	59	M	T2N0M0	T2aG2N0 / CaT	no	50 months
4	42	M	T2N0M0	T2aG2N0 / CaT	no	45 months
5	63	M	T2N0M0	T2bG2N0 / CaT	no	45 months
6*	66	M	T2N0M0	T3aG3N0 / CaT	no	16 months

* Patient developed metastatic disease and received chemotherapy.

Table 2 – Trans- and post-operative parameters of the present series.

Patient	Surgical time (min)	Blood loss (mL)	Hospital stay (days)	Opioids (meperidine - dose)
1	240	100	6	-
2	180	150	6	100 mg
3	150	200	3	-
4	200	150	4	30 mg
5	240	80	2	-
6	260	300	3	60 mg

duction in blood loss, lower level of post-operative pain and excellent esthetic results.

Partial cystectomy must be reserved for a group of patients with bladder cancer that comply with strict selection criteria (11-15). Those with single muscular invasive lesion, with no evidence of in situ carcinoma or previous history of superficial multiple tumors, without involvement of trigone or posterior urethra and where a safety margin of at least 1.5 to 2 cm can be obtained would be good candidates to partial cystectomy. Other potential indications for using the technique are vesical tumors enclosed in diverticula and possibly some cases of urachal adenocarcinoma that involve the bladder neck (6,7,11).

In this initial series of laparoscopic partial cystectomy the transperitoneal approach was used with 5 working ports. The use of 5 punctures seems to technically make the procedure easier due to providing 2 lateral punctures with 5-mm trocars for using the aspiration and one additional auxiliary forceps for traction and/or withdrawal, with the latter being highly useful especially during posterior dissection of the bladder, for the reconstructive time and in pelvic lymphadenectomy. In the inevitable comparison with open partial cystectomy, performed by extraperitoneal approach, we have considered to use the laparoscopic extraperitoneal approach in the near future, though we are quite satisfied with the results of laparoscopic transperitoneal approach for all our cases, from nephrectomies to radical cystectomies, with low morbidity rates. We get the impression that the transperitoneal access allows an easier approach, with wider viewing and working fields.

Vesical closure, which is totally intracorporeal, was performed with continuous absorbable suture in 2 planes in the way it is traditionally performed. Two of the 6 patients presented low-volume urinary drainage that resolved spontaneously within a few days. Such fact reinforces the need of 2 important technical precautions: 1) the bladder should be widely mobilized both anteriorly and posteriorly in order to allow for its easy and tension-free closure and 2) the surgeon should properly master the techniques of intracorporeal suture, which, once the learning curve is overcome, are very precise due to the ideal luminosity and the increase in the vision field provided by the camera. The

surgeon who chooses this approach should also be prepared for the possibility of transoperative ureteral lesion and laparoscopic ureteral reimplantation. Finally, though the camera provides a better visualization of the area to be removed, we continue to routinely obtain transoperative freezing biopsies of the vesical margins before their closure.

The patients need minimal analgesics and none of them required parenteral medication after 36 hours from the procedure (Table-2). Additionally, very low rates of post-operative complications were observed, following the trend in the majority of published series on laparoscopic procedures in urology (2-5,9,10).

In relation to hospitalization time following laparoscopic surgeries, and using the increasing experience with radical prostatectomy, we considered that differences reported in the literature do not result from the endourologic procedure itself, but to the local health system. In the United States, mean hospitalization time following radical prostatectomy is 2 to 3 days, clearly shorter than European series of laparoscopic radical prostatectomies (9,15). American reports confirm such fact, since laparoscopic radical prostatectomies performed more recently have shown a mean hospital stay of 1,6 days (15). Mean hospitalization time in our series of laparoscopic partial cystectomies was 4 days, reminding that in 2 cases there was urinary extravasation and the patients remained in hospital for 6 days as a cautionary measure. As larger experience is acquired, the hospitalization period should be shortened.

The comparison between our data and historical series, mostly from the 70s, in terms of morbidity, is hard to be done and no conclusion can be drawn from those. However, we could observe an incidence of urinary fistula of approximately 15%, indexes of operative wound infection around 10% and hospitalization period of 1 to 3 weeks (11). There is no well described data concerning surgical time, amount of analgesics employed, bleeding and performance of lymphadenectomies, among others, for proper comparison.

Urinary extravasation following partial cystectomy due to transitional cell carcinoma of the bladder, a fact observed in 2 of our cases, brings an unde-

niable risk of neoplastic cellular implantation. The issue of local and working port recurrences in laparoscopy is controversial and, to this moment, lacks a definitive answer. Peritoneal metastases following laparoscopy have also been sporadically reported, in conditions that are often associated with advanced disease, neoplastic ascites and others, especially gynecologic and gastrointestinal cancers (16-19).

In this initial experience with laparoscopic partial cystectomy, we performed lymphadenectomy and the entire bladder release before accomplishing the cystotomy, in order to minimize the handling of local tissues after the bladder opening. Once the resection of the specimen is concluded, it is immediately placed in the extraction pouch, which is closed and left in the iliac fossa for removal at the end of the surgery. One of the patients with high grade tumor developed local recurrence and metastatic disease, a common fact in cases of high grade bladder carcinoma. We did not identify recurrence in the working ports, neither was this fact observed in the available reports of laparoscopic radical cystectomy and radical prostatectomy, though there are isolated reports on port implantation following laparoscopic pelvic lymphadenectomy in patients with advanced transitional cell carcinoma of the bladder, which is known to have a high dissemination potential (2-5,10,16). In this aspect, a valuable piece of information is provided by historical data on partial cystectomy due to bladder cancer: local recurrences in operative wounds or cystectomy sites were uncommon, and measures such as neoadjuvant radiotherapy or intravesical instillations are probably unnecessary before partial cystectomy (6,11,13). However, a local recurrence has been a constant concern when treating transitional cell carcinoma of the urinary tract by endourology.

There are several publications relative to laparoscopic partial cystectomy in benign bladder diseases, mostly addressing the treatment of vesical endometriosis and, sporadically, other benign rarities such as pheochromocytoma (17-19). In relation to the use of laparoscopic partial cystectomy in transitional cell carcinoma of the bladder, there are no descriptions in the literature to this moment. An unique report, relating therapies of vesical preservation and

laparoscopy, was made by Gerber and colleagues who used neodymium: yttrium-aluminum-garnet laser (Nd:YAG laser) with combined cystoscopy and laparoscopy in 5 patients with non-invasive transitional cell carcinoma of the bladder who were candidates to radical cystectomy. Laparoscopy was used to keep the intestinal loops away from the bladder and to monitor the use of intravesical laser, and in 2 cases the bladder serosal surface was treated with laser by laparoscopic route as well. Results were quite poor after 9 months, with 4 of the 5 patients developing systemic disease (20).

While reviewing the literature, it is clear that many issues concerning isolated surgical procedures for vesical preservation in bladder carcinoma remain incompletely evaluated. Classic series of partial cystectomy achieve considerable 5-year survival rates, ranging from 50% to 70% when strict selection criteria are employed (6,7,11,12). It must be stressed, however, that less than 10% of patients in large series reporting bladder cancer have criteria for indicating partial cystectomy (12-14). Our initial series with selected patients presents disease-free survival rates around 80%, with a mean follow-up of 30 months. Finally, though the majority of authors do not recommend laparoscopic radical cystectomy before the surgeon has properly mastered the technique of laparoscopic radical prostatectomy, the laparoscopic partial cystectomy is relatively easier to be performed, though some experience with urologic laparoscopic pelvic surgery is required, as well as skills in intracorporeal suture (4,5).

CONCLUSIONS

In spite of not being performed frequently, there is a place for partial cystectomy in a special group of patients with transitional cell carcinoma of the bladder. Technically, the laparoscopic partial cystectomy can be performed while keeping the same basic principles for resection and reconstruction established for classic open partial cystectomy. Potential advantages of laparoscopic technique in patients undergoing partial cystectomy are lower post-operative morbidity, shorter hospital stay and faster return to daily activities.

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AN ALTERNATIVE NON-INVASIVE TREATMENT FOR PEYRONIE'S DISEASE

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ABSTRACT

Objective: Surgical correction of the deformity and plaque caused by Peyronie's disease has some important disadvantages and extracorporeal shockwave therapy (ESWT) emerged as a new promising therapy. We evaluated prospectively the efficacy and safety of the association of high dose vitamin E and ESWT as a non-invasive treatment for the disease.

Materials and Methods: Twenty-five patients 42 to 68 years old (mean = 54) presenting penile deviation and sexual distress caused by Peyronie's disease were treated in a non-invasive manner. The time of penile deviation ranged from 16 to 52 months (mean = 30). All patients had previous unsuccessful treatment for Peyronie's disease. The angulation's deformity of the penis was assessed by photography at home. The patients received vitamin E (1.200 mg daily) during 3 months and underwent 3 to 6 sessions (mean = 3) of ESWT (3,000 to 4,000 shockwaves) at a power level of 1 to 2 at 1-week intervals.

Results: From 25 patients treated, 16 (64%) reported an improvement in penile angulation, with a mean reduction of 21 degrees (10 to 40). Eight patients reported improvement in their spontaneous erections. Overall, the patients presented only minimal bruising at the site of treatment and skin hematoma. Four patients presented urethral bleeding. The mean angulation after treatment in the control group was 48.67 degrees (30 - 70) and in the study group was 24.42 degrees (0 - 70), statistically significant.

Conclusion: Considering the common complications and the unsatisfactory outcome of the surgical correction for Peyronie's disease, the association of high dose vitamin E and ESWT represents a good option for a non-invasive, effective and safe treatment of the penile deformity.

Key words: penis; Peyronie's disease; extracorporeal shockwave lithotripsy; vitamin E; treatment.

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INTRODUCTION

Peyronie's disease refers to acquired penile deformities during erection (curvature, indentation, hourglass or shortening). Peyronie's disease is characterized by fibrotic plaques of the tunica albuginea of the penis (1). Over 250 years after its first description, the etiology of the Peyronie's lesion remains

unclear. The most accepted hypothesis is that the Peyronie's plaques are caused by aberrant wound healing and scar formation, due to consecutive trauma during intercourse (2-4). Penile deviation is one result of the inelastic plaque, limiting extensibility of the penile shaft and causing an angled erection (5). The symptomatic incidence of Peyronie's disease has been estimated at 1%. In white men, the average age

at onset of Peyronie's disease is 53 years. The asymptomatic prevalence is estimated at 0.4% to 1.0%. In another study with 100 men without known Peyronie's disease, 22% on autopsy were found to have fibrotic lesions of the tunica albuginea compatible with Peyronie's disease (6-9).

Peyronie's disease may cause significant distress, affecting the quality of life of both the patient and his partner. Psychological effects associated with the disease were reported by 77% of patients (7). Besides, there is a clearly suggestion that the clinical incidence of Peyronie's disease is increasing (10). Probably, this increase is associated and seems to coincide with the use of erection-enhancing medications. Although Peyronie's disease is characterized as a gradual spontaneous resolution process, certain features are associated with a lack of spontaneous resolution, including greater than 2-year duration. The treatment may be clinical or surgical. Oral systemic agents include potassium p-amino benzoate, tamoxifen, acetyl-L-carnitine, colchicines and vitamin E (12). On the other hand, there are quite a lot of surgical procedures to repair penile deformities; all of them are invasive, with significant disadvantages to the patient. Recently, encouraging results with the extra corporeal shockwave therapy (ESWT) were reported (12,13).

We prospectively evaluated the association of high dose vitamin E and ESWT in the treatment of the penile deviation caused by Peyronie's disease.

MATERIALS AND METHODS

We studied 40 patients with sexual distress due to penile deviation caused by Peyronie's disease. Patients' age ranged from 42 to 68 years (mean = 54) and the time of penile deviation ranged from 16 to 52 months (mean = 30).

Penile pain was referred by 35 patients but it was not the reason for treatment in any case. Eleven patients presented mild hypertension, 8 had diabetes and 3 have had a radical retropubic prostatectomy. Fifteen patients presented erectile dysfunction, 7 were treated with 50 mg of sildenafil, 4 with 20 mg tadalafil, 3 with 10 mg vardenafil, and 1 with intracavernous injection therapy using tri-mix. All of the 40 patients were previously treated for the penile deviation with-

out success. The previous therapies were low dose of vitamin E, tamoxifen, colchicines, potassium p-amino benzoate and intralesional injections of steroids and verapamil. All patients refused any kind of surgery.

The angulation of the penis was assessed by photography during a normal erection at home, and the diagnosis was confirmed by palpation of the plaque. The size and site of the plaques were assessed by ultrasonography.

The patients were divided into 2 groups: Group - 1, composed of 15 patients that were treated only by high dose vitamin E (1.200 mg daily) during 3 months, and Group - 2, composed of 25 patients that received vitamin E and were submitted to ESWT. The patients underwent 3 to 6 (median = 3) sessions of ESWT at level-I of intensity, using the Lithostar Plus machine (Siemens, Germany), with 1-week interval. The accurate delivery of the shockwaves to the plaques was monitored by a real-time in line ultrasound scanner aided by palpation. Treatment results were assessed by the patient, subjectively. Besides, the objective evaluation was performed by photographs taken at home, palpation of the plaque and ultrasonographic measurements.

The results were shown as means and standard deviations. Two tailed "t" test was used with Bonferroni correction for statistical comparison. P value < 0.01 was considered statistically significant. Trying to predict association between the objective data and subjective response variable, we used logistic regression.

RESULTS

The treatment was very well tolerated, the high dosage of vitamin E had no side effects and the ESWT caused no pain. The use of analgesics was not necessary. The shock waves therapy presented only minor complications including penile bruising and surface bleeding at the point of entry of the shock waves in 19 patients. Two patients developed urethral bleeding, that settled with conservative treatment. The follow-up ranged from 5 to 13 months (mean = 8.5). There is no statistical difference between groups regarding age, diameter ($p = 0.089$) and angulation ($p = 0.25$).

Of the 25 patients treated, 18 (72%) reported a significant decrease on the angulation deformity of the penis (Figure-1). Five patients reported discrete improvement in the disease and 2 reported no improvement in penile angulation. Eight patients referred improvement in their spontaneous erections. Eleven patients reported that subjectively the plaque had diminished. On palpation, the plaques were not detected in 2 patients and had diminished in other 11 patients.

The ultrasound did not detect five plaques that remained easily palpable even by the patients. On the other hand, in seven patients with subjective and palpation improvements the ultrasonographic findings did not change. One patient, otherwise, reported his

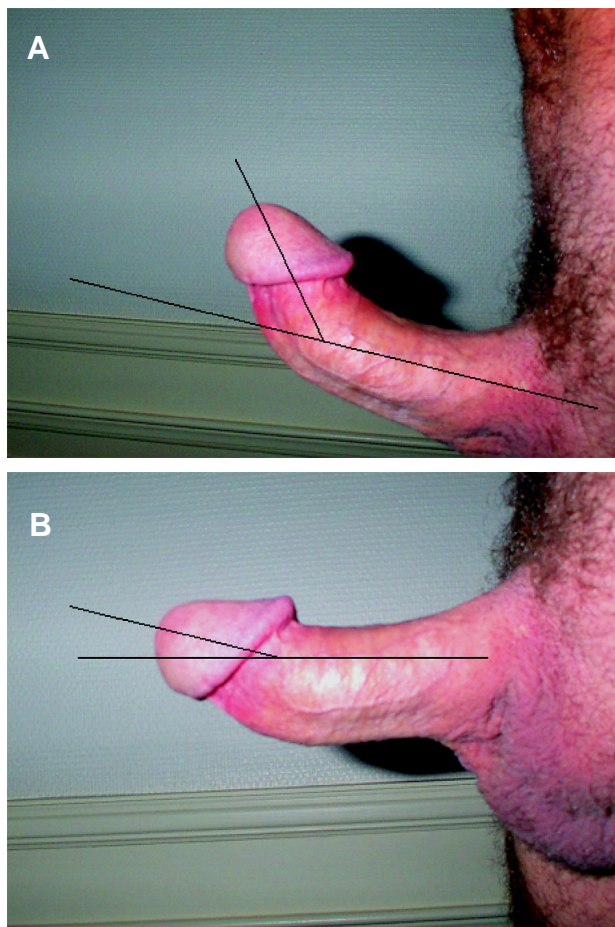


Figure 1 – A) Penile deviation due to Peyronie's disease. Before extracorporeal shockwave therapy. B) Penile shaft after 3 extracorporeal shockwave therapy sessions.

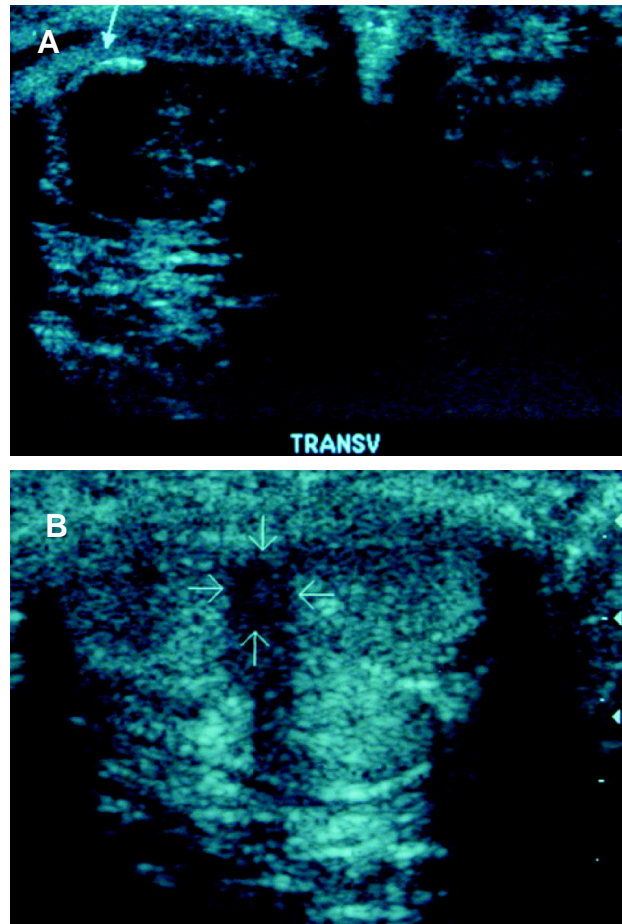


Figure 2 – A) Ultrasound showing Peyronie's plaque. Before extracorporeal shockwave therapy. B) Ultrasound after 3 extracorporeal shockwave therapy sessions.

penis was totally straight and had no detectable plaque either on palpation or on ultrasound (Figure-2).

The mean diameters and the mean angulations are shown on Tables 1 and 2.

When compared the greater diameter and the angulation preceding the procedure and after ESWT there were an important difference in diameter ($p = 0.0001$) and angulation ($p = 0.0001$), attesting the good response of ESWT.

Figures 3 and 4 show the diameter and angle before and after treatment.

The binary logistic regression showed that age ($p = 0.997$, OR = 1), diameter ($p = 0.31$, OR = 2.2) and angulation ($p = 0.697$, OR = 0.98) could not predict good or poor response.

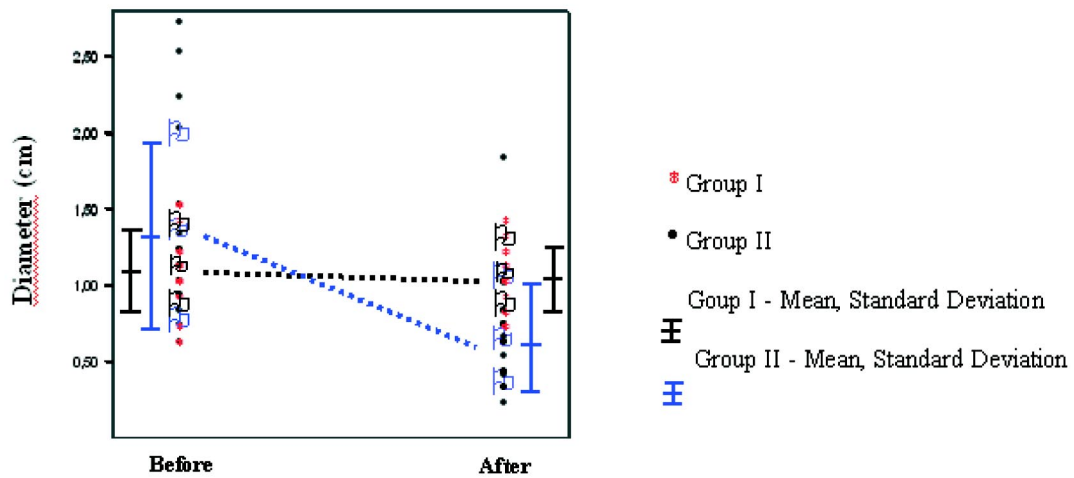


Figure 3 – Plaque diameter (cm) of patients from control (I) and study (II) groups (mean and standard deviation).

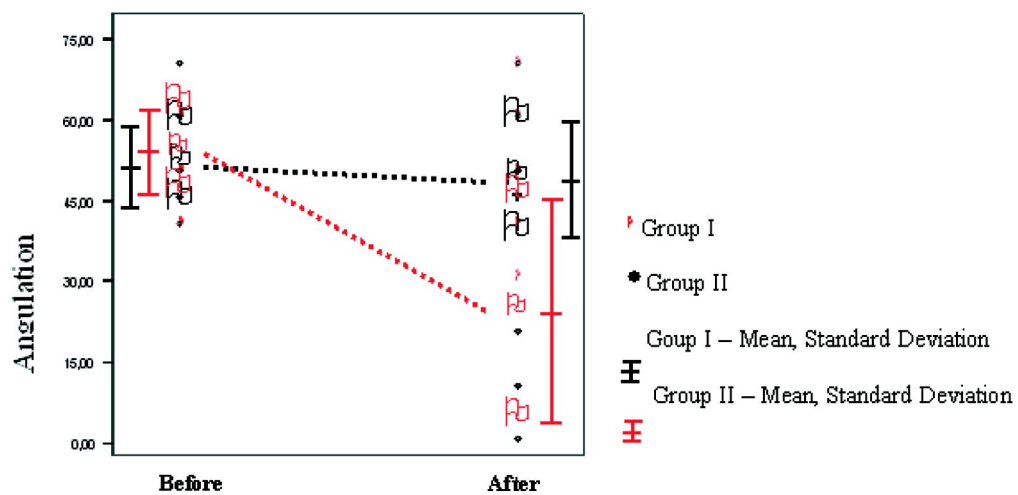


Figure 4 – Penile angulation (degrees) of patients from control (I) and study (II) groups (mean and standard deviation).

Table 1 – Diameter analysis by ultrasonography in the control (I) and study group (II) before and after treatment.

Group	Diameter (cm)	Mean	Standard Deviation
I	Before	1.08	0.26
	After	1.03	0.22
II	Before	1.32	0.61
	After	0.63	0.37

Table 2 – Angulation (in degrees) assessed by photography taken with natural erection at home in the control (I) and study group (II) before and after treatment.

Group	Angulation	Mean	Standard Deviation
I	Before	51.33	7.43
	After	48.67	10.6
II	Before	54.23	7.83
	After	24.42	20.8

DISCUSSION

Peyronie's disease has been previously characterized as a process of gradual spontaneous resolution. However, only 14 % of 97 patients followed during a 5 years period reported the disorders as resolving (11). The pain associated with erection commonly resolves with time but the angulation does not. Peyronie's disease affects the quality of life of both, the patient and his partner. Psychological effects due to Peyronie's disease are reported by the large majority of patients. The exact cause of the disease is unknown and most cases are probably idiopathic (8). Trauma or excessive bending to the erect penis may result in bleeding into the subtunical spaces making tunical delamination (2,3). Therefore, trauma is thought to be the initiating factor in Peyronie's disease (11).

Whatever the cause might be, the outcome is the deposition of connective tissue into the tunica albuginea of the corpora cavernosa. There is initial perivascular inflammatory response that infiltrate the tunica albuginea, followed by the deposition of collagen and fibrin, leading to the penile plaques that cause the angulation deformity of the penis (14).

Although surgical correction of the angulation or the plaque is still considered the gold standard for treating Peyronie's disease, it certainly presents some important disadvantages. Some reduction in penile length and de novo impotence are not uncommon after surgery (10). As a result, minimally invasive treatments have been tried, including ortho-voltage radiation, ultrasound, short wave diathermy, laser therapy and shockwave lithotripsy. The exact mechanism of action of ESWT is still unknown (11) but there are 2 theories: a direct damage to the plaque (15) and an increased of vascular density of the area caused by ESWT, leading to an inflammatory reaction which results in lyses of the plaque and removal by macrophages (12).

In previous studies, the proportion of patients showing an improvement in their erection with ESWT therapy ranged from 47% to 71% (12,13). We associated vitamin E, a common treatment for Peyronie's disease, using the dosage of 1.200 mg daily (4 times greater than the dose proposal) (2) and ESWT in the attempt of improving the deformity in a non-invasive way. In this present study, 18

patients (72%) referred improvement in the penile angulation. However, 8 patients referred improvement in the quality of their spontaneous erections. There were no major complications. Petechiae, skin hematoma, penile bruising and urethral bleeding were the only complications.

CONCLUSION

This initial experience with the association of high dose of vitamin E and ESWT is an effective and safe non-invasive treatment for Peyronie's disease. Further studies with long-term follow-up are recommended to confirm the efficacy of this therapy.

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EDITORIAL COMMENT

The authors present a further study on the use of extracorporeal shock wave therapy (ESWT) for the treatment of Peyronie's disease. In contrast to the most recently published series describing disappointing results under prospective long-term designs (1,2) the authors present ESWT as successful method for treating penile curvatures. These results are also contradictory to the recently published exploratory meta-analysis of the studies published so far (3). In this meta-analysis no clear effect of ESWT on penile curvature and plaque size was evident (3)

How could these remarkably differences be explained? Unfortunately the authors do not discuss these aspects. In contrast to the previous published in the literature the authors combined classical ESWT with the oral administration of high dosage of vitamin E, four times higher than normal. Could this aspect be the key aspect to improve the effect of ESWT? Regarding to the published literature the use of vitamin E does not seem effective compared to the natural history (4,5). Thus it does not seem very reasonable to combine to ineffective methods for treatment of Peyronie's disease that is really a disorder difficult to cure. However, the data of the present study seem to be impressive because the only administration of vitamin E as control group is not effective - as previously described.

Although ESWT is not favored as standard treatment by our Peyronie's study group (2,3) the authors should be encouraged for further studies of their concept.

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CHANGES IN CALCIUM OXALATE CRYSTAL MORPHOLOGY AS A FUNCTION OF SUPERSATURATION

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ABSTRACT

Purpose: To study the changes in calcium oxalate crystal morphology induced by different levels of supersaturation (SS) in human urine.

Materials and Methods: Twenty-four hours urine samples from 5 normal men were collected. Each specimen was centrifuged and filtered. About 200 mL of each sample was dialyzed overnight. Aliquots of 2 mL of urine was then added to a 24-wells tissue culture plate and checked for crystal absence. Calcium oxalate crystals were precipitated from each sample by adding sodium oxalate and calcium chloride in sufficient quantities to induce spontaneous crystallization. Finally, each plate hole was examined with an inverted polarized microscope (X500 magnification). Initial SS of each sample relative to calcium oxalate was calculated using an iterative computer program.

Results: Crystal formation was connected to relative calcium oxalate (CaOx) SS. At SS of 10, small crystals of similar shape were formed, mainly CaOx dihydrate morphology. At SS of 30, there was an enormous increase in the number of crystals, that kept the same size. SS greater than 50 produced larger crystals with different shapes and multiple crystalline aggregates. Urine was able to tolerate, i.e., to avoid crystal formation, until SS ratios of approximately 10.

Conclusions: Relative CaOx SS and the concentration ratio of calcium to oxalate are important determinant factors of crystal morphology. Non-dialyzable urinary proteins can act as inhibitors and influence the structure of formed crystals. Additional studies from patients with kidney stones are needed in order to establish whether crystal size and habit distribution are different from crystals in normal urine.

Key words: urolithiasis; crystallization; calcium oxalate

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INTRODUCTION

During the process of water conservation, kidneys supersaturate urine (1). Supersaturation (SS) in relation calcium oxalate and phosphate salts is the driving force for crystallization in solutions like urine, which means that it will contain crystals that are formed spontaneously. If inhibitors of crystal formation were not able to act and control their size, the final result will be nephrolithiasis and/or nephrocalcinosis (2,3).

The understanding of crystalluria requires some knowledge of crystal nucleation, growth and aggregation, all of which depend greatly on solution concentration. Both the monohydrate and dihydrate species of calcium oxalate (CaOx) crystals are present in kidney stones (4). It has been proposed that crystalluria may be predictive of a nephrolithogenic tendency (5). Also, crystalluria with oxalate crystal volume measurement is a non-invasive, easily performed investigation, and can give feedback on the efficacy of urolithiasis therapy (6).

The aim of this study was to examine the changes in calcium oxalate crystal morphology induced by different levels of SS in human urine.

MATERIALS AND METHODS

Twenty-four hours urine samples from 5 normal subjects was collected without preservative. This urine was screened to exclude bacteria, protein and glucose before being pooled. Each specimen were centrifuged for 15 min at 8,000x g and passed through Millipore filters with a pore size of 0.22- μ m (Millipore Corp., Bedford, Massachusetts). About 200 mL of each sample was dialyzed for 24 hours against 5 liters of distilled water at a temperature of 4°C, with 2 changes of water. The dialysis membranes had 3-kd molecular weight cutoff.

Stock solutions of calcium chloride (2 mm) and sodium oxalate (0.5, 1 and 4 mm) were used. All solutions were prepared with reagent-grade chemicals, and double-distilled water.

Aliquots of 2 mL of dialyzed urine was added to a 24-wells tissue culture plate at 37°C and checked for crystal absence. After that, calcium oxalate crystals were precipitated from each urine sample by adding 0.5 mL of sodium oxalate and 0.5 mL of calcium chloride. Oxalate ion was added as the last component, after mixing the other 2 components. One well had no oxalate added to serve as control.

The plate was incubated in a shaking water bath at 37°C for 1 hour. Finally, the content of each plate well was examined for crystal identification with an inverted polarized microscope (X500 magnification) and optical photomicrographs of any crystals present were taken. The size of individual crystals was estimated using a graduated scale in ocular lens.

The SS of each sample in relation to calcium oxalate at the point of precipitation was calculated by an interactive computer program (Equil 1.3, University of Gainesville, FL, USA).

RESULTS

Relative SS increased due to the increase of oxalate concentration. Using dialyzed urine and calcium chloride at a fixed concentration of 2 mm, the addition of 0.5, 1 and 4 mm sodium oxalate resulted in SS of 10, 30 and 50, respectively. Urine was able to tolerate, i.e., to avoid crystal formation, until SS ratios of approximately 10.

Crystal formation seems to be related to calcium oxalate SS. At SS of 10, small crystals of similar shape were formed, mainly CaOx dihydrate morphology (Figure-1). Their size could be estimate to vary between 15 to 20 μ m.

Using sodium oxalate in 1 mm to produce a relative SS of 30 caused an enormous increase in the

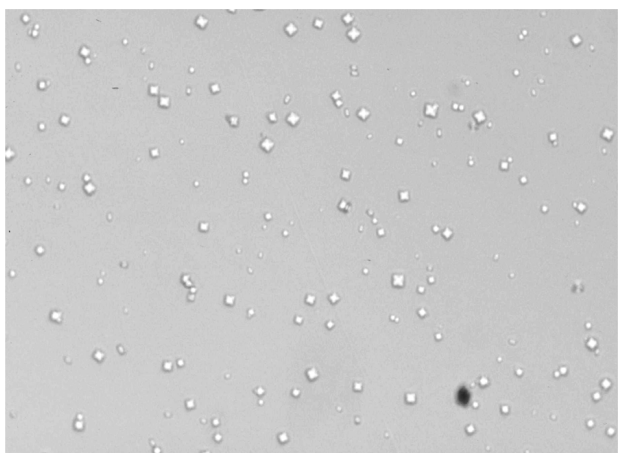


Figure 1 – Calcium oxalate crystals with typical tetragonal bipyramidal habit. (500x-magnification)

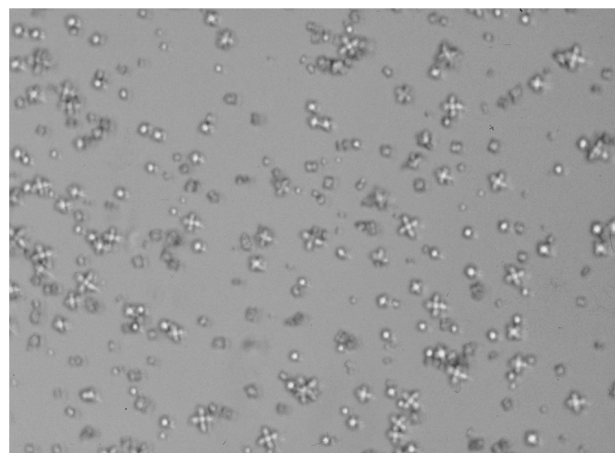


Figure 2 – Same morphology as figure 1 but crystals increased in number, as SS increased. (500x-magnification)

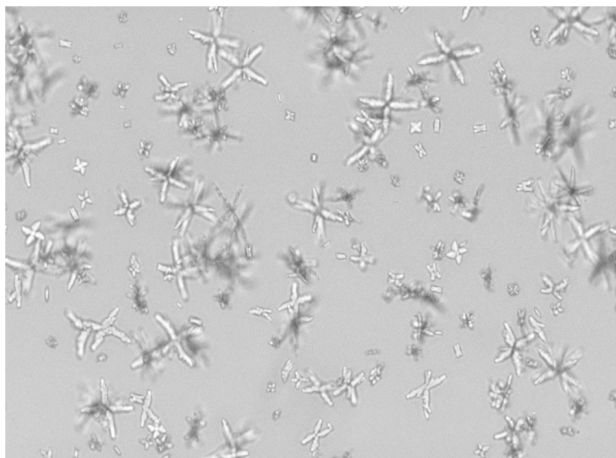


Figure 3 – With high level of SS, the crystals changed, showing X-shaped habit and increased diameter. (500x-magnification)

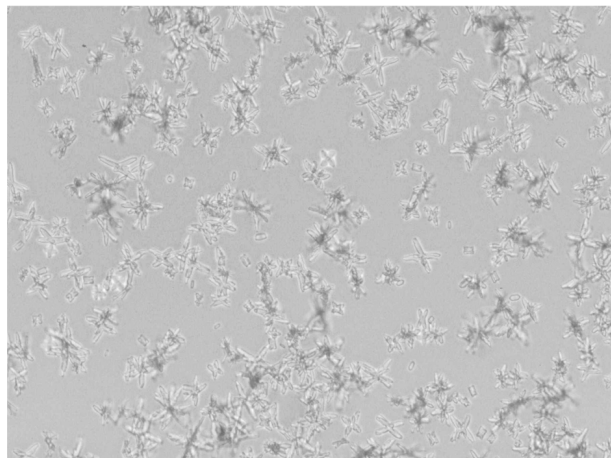


Figure 4 – Multiple crystalline aggregates, with increased volume and different habit. (500x-magnification)

number of crystals, most of them keeping the same size and morphology observed with an SS of 10 (Figure-2). These octahedral crystals also have the characteristic morphology of CaOx dihydrate crystals.

SS greater than 50 produced larger crystals (Figure-3) with different shapes and multiple crystalline aggregates (Figure-4). Some of these crystals suffered a peptization process and generated fragments of 50 to 100 μm of diameter. We should also observe that, when the concentration ratio of calcium to oxalate was kept above one, the crystals formed had a typical CaOx dihydrate morphology.

DISCUSSION

Crystals of calcium oxalate are often found in urine (7). Even though crystalluria by itself could be considered as a harmless phenomenon, in some patients it could imply an existing or preexisting urinary SS and an increased risk of nephrolithiasis (8). A pathologic calcification like a Randall's plaque can also be generated by intense deposition of crystals inside the urinary tract (9).

In urine, measured CaOx SS rarely exceeds 30. This suggests that nucleation inside the urinary tract is heterogeneous. In this scenario, clusters of crystal-salt ions can be generated by a central nucleus of cell debris, for example. Higher CaOx SS, probably around 80 is apparently necessary to create

homogeneous nucleation (10). This kind of nucleation is characterized by a decrease in the average crystal size caused by intense precipitation and peptization of crystals.

In this work we were able to demonstrate that different urinary CaOx SS modulates structure and crystalline habit in human urine. Using this model, we could verify that relative SS and the concentration ratio of calcium to oxalate are important factors in the determination of crystal morphology. The urine blocked formation of crystals until CaOx SS reached 10. This effect is probably due to several non-dialyzable macromolecular inhibitors present in it, like nephrocalcin, glycosaminoglycans, Tamm-Horsfall/uromodulin, and osteopontin for example (2-3,11-12). When the relative SS varied between 10 and 30, there was an interesting relationship among these inhibitors of crystallization and the physicochemical burden imposed by high concentration of calcium and oxalate. We can attribute the increase of crystal number to SS and the preservation of crystal structure to urinary proteins, as previously demonstrated by Wesson et al. (4). When the CaOx SS was higher than 50, there was almost no space for inhibitors of crystallization to act and the crystals aggregated and peptized almost immediately.

Very similar conclusions to this study were obtained by Burns & Finlayson (13). In their work,

the crystals were examined optically and with X-ray diffraction and their morphology was found to be closely related to relative SS. Nevertheless, they used simple buffer solutions, rather than urine, and even the authors pointed that doubtfully their results could apply to a complex solution as urine.

CONCLUSIONS

Relative CaOx SS and the concentration ratio of calcium to oxalate are important determinants of crystal morphology, mainly in the range of SS of 10 to 30. Non-dialyzable urinary proteins can act as inhibitors and influence the structure of formed crystals. Additional studies from patients with kidney stones are needed to establish whether crystal size and habit distribution are different from crystals in normal urine.

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EDITORIAL COMMENT

In this manuscript, the authors assess changes in calcium oxalate crystal morphology with various changes in urine supersaturation. Using human urine in an in vitro system, the authors found various changes in crystal morphology as the human urine supersaturation was increased from 10 to greater than 50. The authors conclude that the relative calcium oxalate supersaturation and the concentration ratio of calcium to oxalate are important determinants of crystal morphology. Overall, this is an interesting

concept, but one that is not particularly new. Moreover, the authors comment that urinary proteins such as glycosaminoglycans, Tamm-Horsfall proteins and osteopontin may act as inhibitors of calcium oxalate crystallization. However, based on the present findings, they provide no evidence that these proteins were present in the urine samples and their observations with regard to the inhibitory characteristics of these proteins are speculative and based on previous publications.

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PRIMARY RENAL SARCOMA WITH MORPHOLOGIC AND IMMUNOHISTOCHEMICAL ASPECTS COMPATIBLE WITH SYNOVIAL SARCOMA

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ABSTRACT

Primary synovial sarcoma of the kidney is a rare tumor that is difficult to diagnose. We present one case that was not diagnosed through fine needle aspiration, requiring a morphologic and immunohistochemical analysis of the incision biopsy. Since the tumor was surgically unresectable, chemotherapy was employed previously to definitive radical surgery.

Key words: kidney neoplasms; synovial sarcoma; surgery; chemotherapy

Int Braz J Urol. 2004; 30: 210-3

INTRODUCTION

The synovial sarcoma is an uncommon tumor, representing approximately 6 to 10% of the primary sarcomas of soft tissues. Recently, rare primary cases were described in the kidney (1-3). Signs and symptoms are similar to any primary renal tumor. Unspecific preoperative findings, associated with its rarity, prevent its early diagnosis.

CASE REPORT

Male, 27-year old patient, presenting gross hematuria and large abdominal mass. The abdominal computed tomography showed a large retroperitoneal mass, radiologically consistent with malignant neoplasia (Figure-1). Aspiration puncture of the lesion was performed with fine needle, diagnosing small cell malignant neoplasia (Figure-2).

During staging, no distant lesions were observed. Due to the large tumor volume, an option was made to performing adjuvant chemotherapy. A chemotherapy protocol for Wilms' tumor was started,

with actinomycin 50 µg/Kg and vincristine 0.04 mg/Kg, for 4 cycles, obtaining minimal response, with the mass remaining unresectable.

Open biopsy of the lesion was indicated, aiming a better subtyping of the neoplasia. Histopathological examination revealed a malignant neoplasia constituted by 2 distinct cell populations, one consisting of small cells with round hyperchromatic nu-

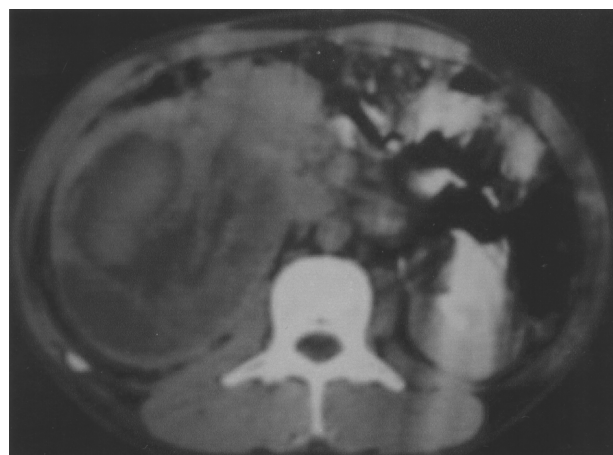


Figure 1 – Abdominal computed tomography evidencing a voluminous tumoral mass in right kidney.

clei and high mitotic index (poorly differentiated subtype with high malignancy grade) and the other of spindle cells with oval nuclei, fine chromatin, indistinct nucleoli and low mitotic index (monophasic fibrous subtype with low malignancy grade) surrounding renal tubules cystically dilated (Figure-3). The immunohistochemical study was consistent with synovial sarcoma: positive for pan-cytokeratin, epithelial membrane antigen, vimentin, Bcl-2 and negative for CD99/MIC-2, muscle-specific desmin and actin HHF-35 (Figure-4). A new chemotherapy cycle was promptly started with iphosphamide 50 mg/Kg and adriamycin 1 mg/Kg, for 4 weeks.

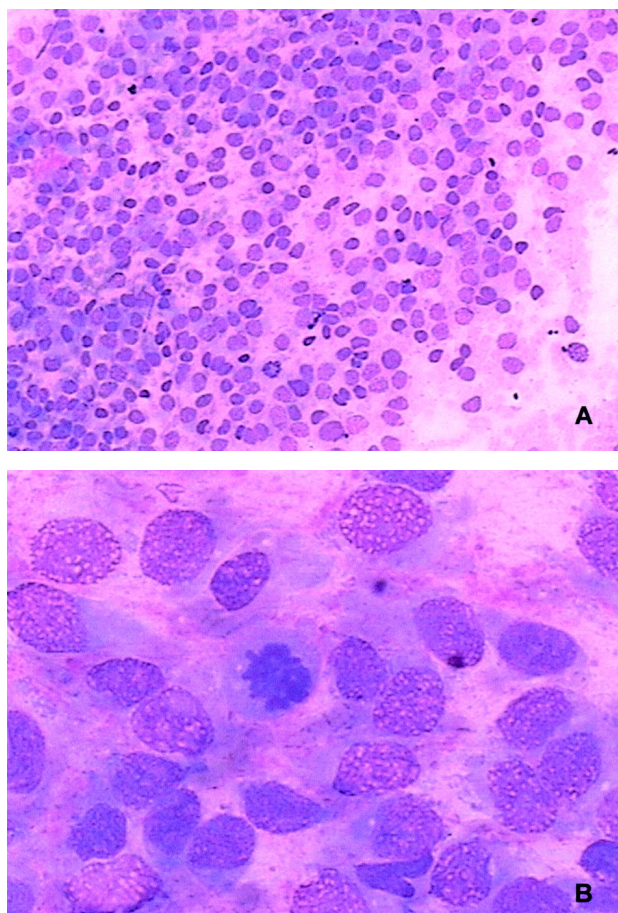


Figure 2 – Smears obtained by fine needle aspiration puncture. A) - Abundant scattered small round cells. B) - Detail of tumor cells with ovoid nuclei, scarce cytoplasm and mitotic figure (Giemsa, X33 and X132, respectively).

With the considerable reduction of the tumor (approximately 50%), radical nephrectomy by right thoracolaparotomy was indicated, with partial resection of diaphragm and ascending colon being necessary. No macroscopically involved lymph nodes were found intraoperatively.

Histopathological examination of the surgical specimen revealed an encapsulated tumoral mass measuring 21 x 15 x 9 cm, weighting 1628 g, with extensive areas of necrosis and hemorrhage. The adrenal gland, ureter or renal vein were not involved, and the lymph node analysis was negative for neoplasia. Patient has been followed for 1 year with no signs of recurrence.

DISCUSSION

Primary synovial sarcoma of the kidney is a type of renal sarcoma. Leiomyosarcoma represents 40 - 60% of the described renal sarcomas, followed by rhabdomyosarcoma, histiosarcoma, chondrosarcoma and osteosarcoma, liposarcoma, angiosarcoma and hemangiopericytoma (1-3). Only 20 cases were reported in the literature. It affects young individuals, of both genders, between 20 and 50 years, presenting a clinical picture that is similar to renal tumors in general (1). There is no clinical or imaging characteristic that can indicate the diagnosis (1-5). Differential diagnosis with other renal tumors constituted by spindle or round cells is difficult, requiring immunohistochemical studies or molecular analysis. Among the differential diagnoses, are especially the mesoblastic nephroma and adult neuroectodermal tumor (PNET), in addition to adult Wilms' tumor and fibrosarcoma.

The mesoblastic nephroma is usually immunoreactive for actin and negative for epithelial markers. The synovial sarcoma presents immunoreaction for epithelial markers such as cytokeratin and epithelial membrane antigen, generally with focal distribution. The proteins CD99 and Bcl-2 were detected in 70% and 100% of cases, respectively. PNET tumors are immunoreactive to CD99 and generally negative for Bcl-2 and epithelial membrane antigen. However, since there is not a specific immunohistochemical marker for the synovial sarcoma, definitive diagno-

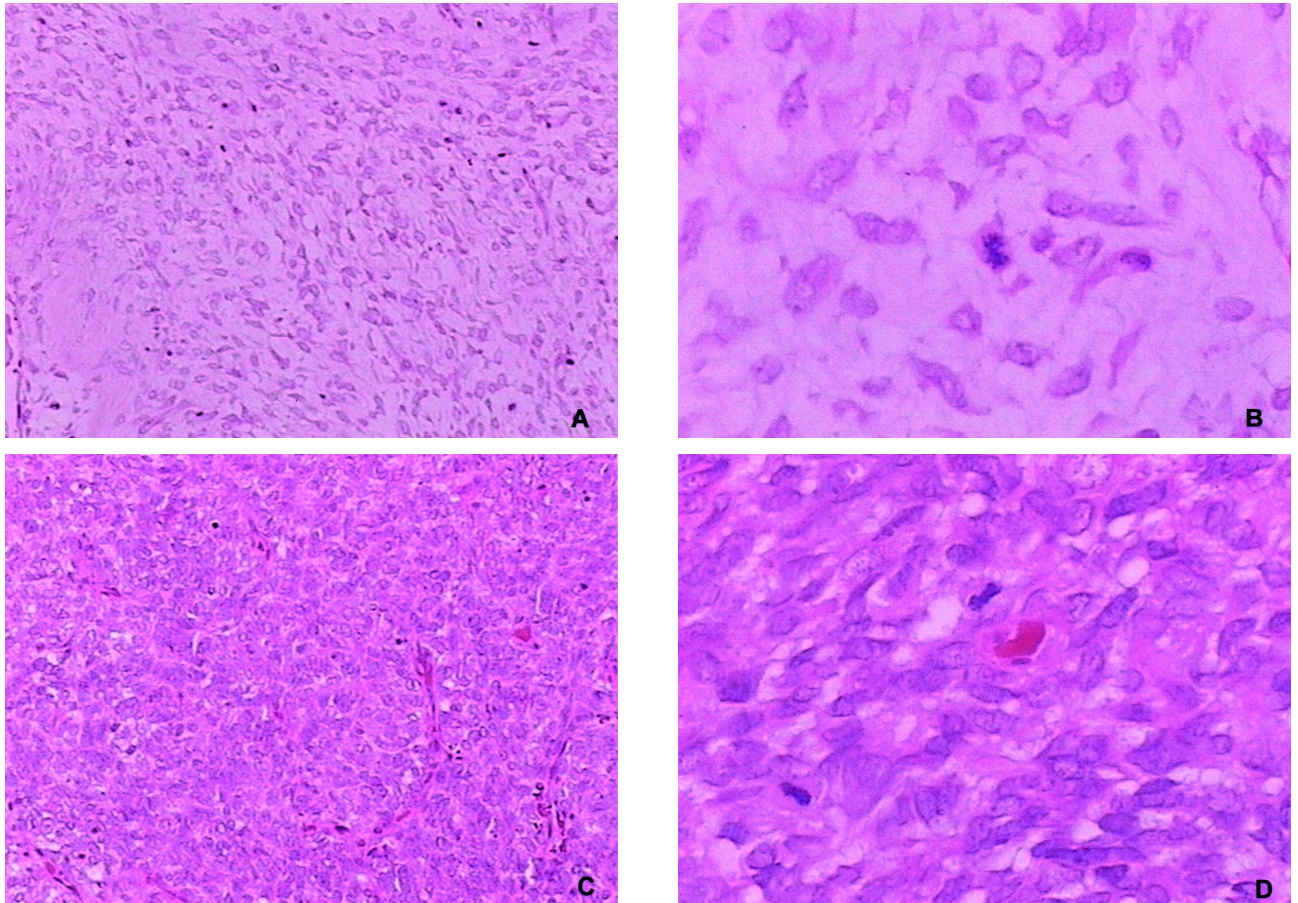


Figure 3 – Histology of incision biopsy showing a spindle cell component (monophasic fibrous) (A and B), and small round cells component (poorly differentiated) (C and D) (HE, A and C, X33; B and D, X132).

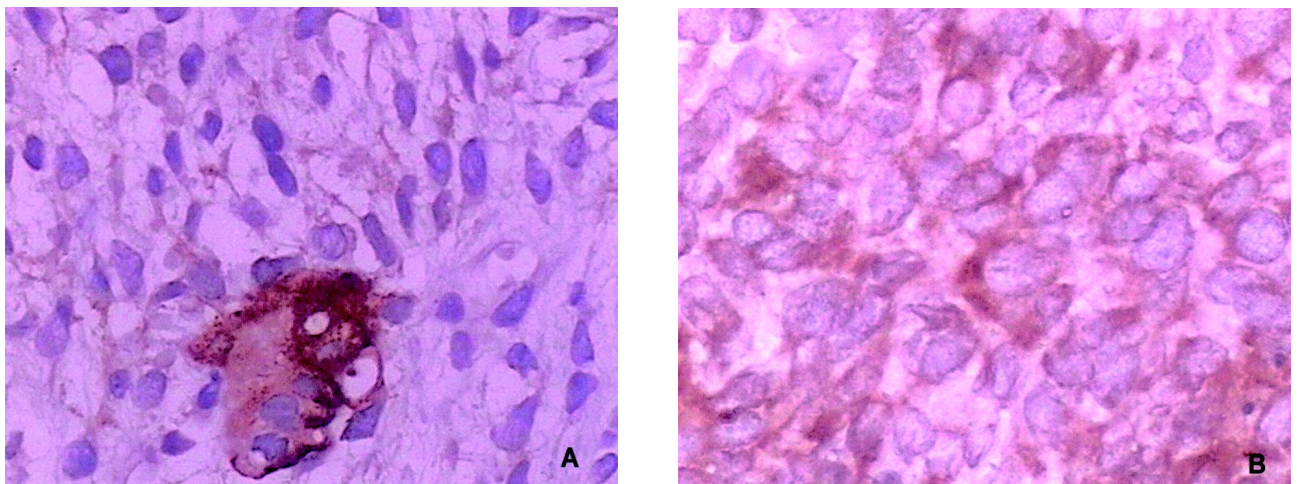


Figure 4 – Immunohistochemical study. A) - Immunoreactivity of the monophasic fibrous component to epithelial membrane antigen around imprisoned renal tubule. B) - Positivity of the poorly differentiated component to Bcl-2 (Immunolabeling, X132).

sis can be achieved only by identifying the characteristic T chromosomal translocation (X; 18), through reverse transcriptase polymerase chain reaction with fluorescence in situ hybridization (FISH) (1-3). In the present case, since we could not count on chromosomal analysis, diagnosis was established based on conventional morphologic microscopic analysis and immunohistochemistry.

In one research on 17 cases (1), 4 presented lung, liver or bone metastases and evolved to death, 2 presented pelvic recurrence.

Adjuvant and neoadjuvant chemotherapy, using high doses of doxorubicin, cisplatin and iphosphamide (14 g/m²) performed in 14 patients without initial metastatic disease, rendered 93% of patients disease-free in a mean follow-up of 37 months (6 to 85 months) (5).

The base for chemotherapy in such cases is the iphosphamide, usually reducing the tumor volume by 50% or more (3,5). There is no consensus in the literature concerning the standard chemotherapy scheme. In this case, the scheme consisting in

iphosphamide and adriamycin reduced approximately 50% of the tumor, enabling its surgical resection.

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RENAL LIPOSARCOMA

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ABSTRACT

Introduction: Liposarcoma is a malignant mesenchymal tumor frequently located in retroperitoneum, and rarely presenting an isolated lesion in kidney.

Case Report: Female, Caucasian, 49-year old patient, with family history of renal polycystic disease, was selected for organ donation. During preoperative examinations a renal pleomorphic liposarcoma was detected. She was treated with radical nephrectomy and remains asymptomatic, without evidences of recurrence in control ecographic examinations after a 4-year follow-up.

Comments: Renal liposarcoma is a rare tumor. We report one case incidentally diagnosed during a routine pre-transplantation assessment in renal donor.

Key words: kidney; kidney neoplasms; liposarcoma
Int Braz J Urol. 2004; 30: 214-5

INTRODUCTION

Liposarcoma is a malignant mesenchymal tumor frequently located in the retroperitoneum (1). Isolated lesion in kidney has rarely been described (2). We present a case of renal liposarcoma incidentally diagnosed during the assessment of a candidate to renal donation for transplantation.

CASE REPORT

Female, Caucasian, 49-year old patient, with family history of renal polycystic disease, was selected for organ donation. During preoperative examination a rounded, heterogeneous, well-defined mass with solid aspect was detected by renal ultrasonography, adjacent to the lower pole of the left kidney. A computerized tomography was performed, showing an expansive, solid, heterogeneous lesion with -38 UH attenuation, poorly defined in the lower third's external edge, measuring 3.8 x 3.8 cm and with preservation of perirenal fat. There was no contrast medium impregnation in the tumoral lesion during

the late phase (Figure-1). The angiography showed a hypovascularized and hypodense mass. The intravenous urography was normal. Radical nephrectomy was performed following the intraoperative freezing diagnosis of malignant lesion. The pathological examination revealed a brownish nodular structure with 4.8 cm in diameter, and the microscopy detected neoplastic tissue of mesenchymal origin, spindle and oval cells with abundant cytoplasm, hyperchromic nuclei and intense pleomorphism (Figure-2), characteristic of a renal pleomorphic liposarcoma. The patient has been followed up for 4 years and remains asymptomatic, without evidence of recurrence on control ecographic examinations.

COMMENTS

Renal liposarcoma is a rare tumor. There are few well-documented reports in the literature, many of those are associated with tuberous sclerosis and probably correspond to angiomyolipomas. The majority of published cases refer to well-differentiated tumors, with dimensions greater than 5 x 5 x 4 cm



Figure 1 – The computerized tomography shows an expansive, solid, heterogeneous lesion with -38 UH attenuation, poorly defined, in the external edge of the left kidney's lower third, measuring 3.8 x 3.8 cm and with preservation of perirenal fat.

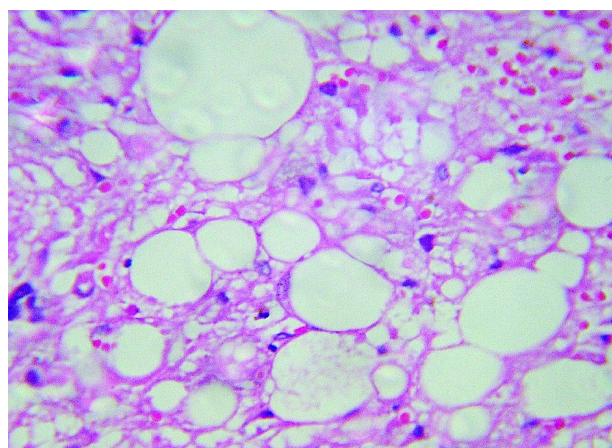


Figure 2 – Histopathological study demonstrating renal pleomorphic liposarcoma. Neoplastic tissue of mesenchymal origin, spindle and oval cells with abundant cytoplasm, hyperchromatic nuclei and intense pleomorphism (HE, X40).

and presenting symptoms such as pain, hematuria, abdominal mass or loss of weight. The liposarcoma is classified according to the histological type, in well-differentiated, myxoid and pleomorphic. The myxoid type occurs in 60%, the well-differentiated in 25% and the pleomorphic in 10% of the cases. The pleomorphic type is highly aggressive with high rates of metastases (2). We describe an incidentaloma of the pleomorphic type with 4.8 cm in diameter.

Perirenal localization is often observed in such tumors, which can mimic renal cystic tumor. The differential diagnosis must include renal cell carcinoma or atypical angiomyolipoma. Some features in the computerized tomography, such as linear vascularization, aneurismal dilatation, hematoma and presence of tissue with fat attenuation speak for angiomyolipoma. Frequently the definitive diagnosis is achieved only through the pathologic examination (3).

The prognosis of liposarcomas depends on the degree of differentiation, size, histological type and tumor staging. The total surgical resection with free margins offers a good probability of cure (2). The standard treatment has been radical nephrectomy, associated or not with radiotherapy. Clinical follow-up is important to monitor tumor recurrence. There is a report of recurrence 13 years after the initial surgery (2). The case we described here was treated with

radical nephrectomy, presenting a 4-year follow-up, without evidence of recurrence to this moment.

Dr. José R. L. Ferreira and Dr. Alexandre Galvão Bueno assisted in preparing the images and the histological material.

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RENAL HEMANGIOMA

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ABSTRACT

Introduction: Renal hemangioma is a relatively rare benign tumor, seldom diagnosed as a cause of hematuria.

Case report: A female 40-year old patient presented with continuous gross hematuria, anemia and episodic right lumbar pain, with onset about 3 months previously. The patient underwent multiple blood transfusions during her hospital stay and extensive imaging propedeutics was performed. Semi-rigid ureterorenoscopy evidenced a bleeding focus in the upper calix of the right kidney, with endoscopic treatment being unfeasible.

The patient underwent right upper pole nephrectomy and presented a favorable outcome. Histopathological analysis of the surgical specimen showed that it was a renal hemangioma.

Comments: Imaging methods usually employed for diagnostic investigation of hematuria do not have good sensitivity for renal hemangioma. However, they are important to exclude the most frequent differential diagnoses. The ureterorenoscopy is the diagnostic method of choice and endoscopic treatment can be feasible when the lesion is accessible and electrocautery or laser are available. We emphasize the open surgical treatment as a therapeutic option upon failure of less invasive methods.

Key words: kidney; hemangioma; hematuria
Int Braz J Urol. 2004; 30: 216-8

INTRODUCTION

Renal hemangioma is a relatively rare benign tumor, seldom diagnosed as a cause of hematuria. Approximately 200 cases were reported since this condition was first described by Virchow in 1867 (1). This tumor can be classified as cavernous or capillary and the majority of lesions have a diameter of less than 1 cm. It affects most frequently young adults and there is no preference for gender.

Clinical presentation is characterized by hematuria ranging from intermittent microscopic hemorrhage to abundant, continuous bleeding, with hemodynamic repercussion.

We report one case of gross hematuria due to renal hemangioma emphasizing clinical presentation, imaging diagnosis and the treatment prescribed.

CASE REPORT

Female, 40-year old patient, complained of episodic gross hematuria with onset around 4 years previously, which became continuous and associated with episodic right lumbar pain in the past 3 months.

On the physical examination, gross hematuria and anemia were evident. The patient underwent an ultrasonography of the urinary tract, excretory urography and abdominal and pelvic computerized tomography that did not evidence significant alterations. The semi-rigid ureterorenoscopy showed a bleeding focus in the upper calix of the right kidney, with endoscopic treatment being impossible due to difficulty of access. Renal arteriography was performed, showing no alteration (Figure-1). The patient maintained active bleeding, leading to persistent anemia and re-

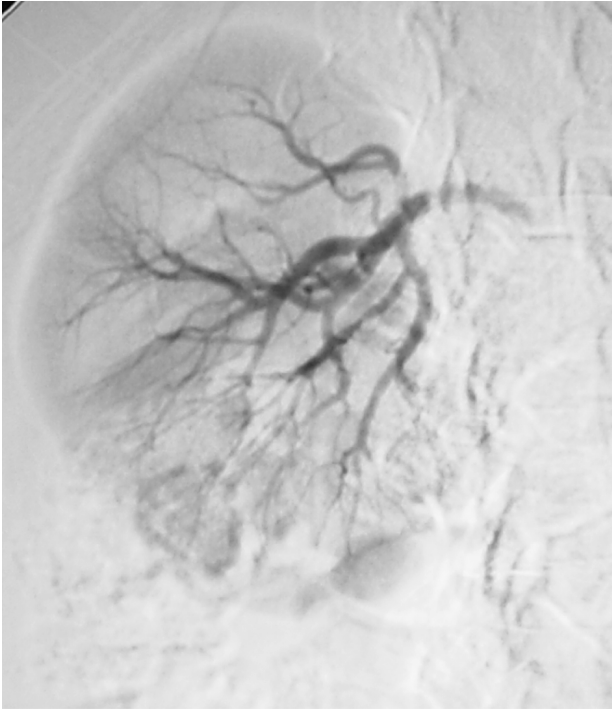


Figure 1 – Right selective renal arteriography, without identifying the bleeding focus.



Figure 2 – Right renal arteriography following selective embolization of the upper pole (arrow).

quiring multiple blood transfusions during hospitalization. Renal arteriography was unable to evidence the bleeding focus. However, considering its previous location on semi-rigid ureterorenoscopy, an option was made towards selective embolization of the right kidney upper pole (Figure-2).

Since there was no hematuria remission following arterial embolization, the patient underwent a right upper pole nephrectomy (Figure-3), presenting a favorable outcome, without hematuria within a 6-month follow-up. Histopathological analysis revealed renal hemangioma.

COMMENTS

Renal hemangioma is seldom diagnosed as a cause of hematuria. Imaging examinations usually are not helpful for diagnosing hemangioma, though they are important in order to exclude more frequent causes of hematuria.

The differential diagnosis of renal hemangioma must include papillary necrosis, ectopic pa-

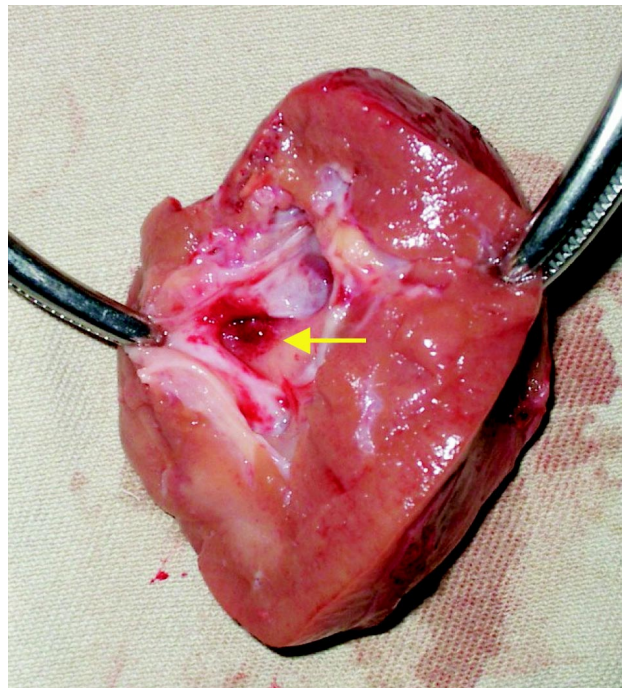


Figure 3 – The macroscopic surgical specimen revealed a lesion measuring approximately 0.5 cm in the upper calix of the right kidney (arrow).

pilla, hemorrhagic papillitis and urothelial carcinoma, among others (2).

Currently, the flexible ureterorenoscopy is the method of choice for diagnosing this kind of lesion (3). When available, the electrocautery or laser constitutes also the treatment of choice, if the lesion is accessible. However, in the absence of such facilities, open surgery is indicated in cases of persistent bleeding.

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MULTIPLE FOREIGN BODIES IN THE ANTERIOR AND POSTERIOR URETHRA

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ABSTRACT

Foreign bodies of the urethra and bladder are seen with iatrogenic injury, self-insertion, and rarely migration from adjacent sites. Treatment is focused on foreign body extraction, diagnosing complications, and avoiding compromise of erectile function. With advances in endourology, the majority of cases can now be managed endoscopically. We present a case of a man with multiple foreign bodies located both above and below the urogenital diaphragm. Advancing the posterior objects intravesically and extracting with a stone basket accomplished successful removal.

Key words: urethra; bladder; foreign body; endoscopy
Int Braz J Urol. 2004; 30: 219-20

INTRODUCTION

Foreign bodies of the urethra and bladder are seen with iatrogenic injury, self-insertion, and rarely migration from adjacent sites. Treatment is focused on foreign body extraction, diagnosing complications, and avoiding compromise of erectile function (1-4).

CASE REPORT

A 59-year-old male presented to the emergency room with dysuria and urinary dribbling. After questioning, he noted inserting multiple small metal objects into his urethra. Patient denied any fevers or chills. He was able to dribble blood tinged urine with straining. The patient reported a history of major depression, but no history of self-injurious behavior. His physical examination was significant for a non-distended bladder, meatal stricture, and multiple palpable foreign bodies from the glans penis to the penoscrotal junction. X-rays of the pelvis showed multiple metallic objects approximately 1 cm in diameter in the anterior and posterior urethra (Figure-1).

The patient was taken to the operating room after receiving pre-operative intravenous antibiotics. After performing a meatotomy, a total of 10 metallic objects in the anterior urethra were milked out and delivered from the urethra. A cystoscopic examination was performed which demonstrated multiple metallic

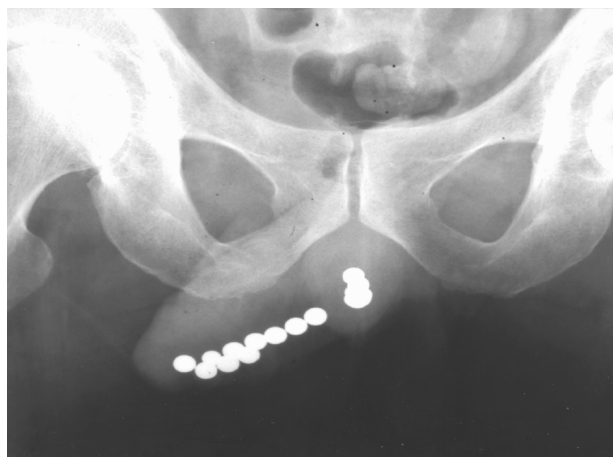


Figure 1 – X-ray of the pelvis showed multiple metallic objects approximately 1 cm in diameter in the anterior and posterior urethra.

objects in the proximal urethra. These objects were pushed into the bladder using the cystoscope. After this, the metallic objects were individually removed using a three-prong stone basket. An 18F urethral catheter was kept in place for 24 hours. The patient received a complete inpatient psychiatric evaluation post-operatively. He was subsequently discharged home after successfully voiding.

COMMENTS

Foreign bodies are most commonly inserted into the genitourinary tract by psychiatric, intoxicated, confused, or sexually curious patients. It has also been documented that well-adjusted patients without concomitant psychiatric illnesses have attempted to relieve urinary retention or itching by inserting objects into the urethra.

Co-morbidities reported in patients presenting with foreign body insertion include exotic impulses most commonly sexual in nature, mental illness, borderline personality disorder, and intoxication. Alibadi et al. (4) reported that reasons for self-instrumentation in their population of 18 patients included auto-eroticism in 6 (33%), overt psychiatric causes in 2 (11%), to aid in voiding in 7 (39%), and in 3 patients (17%) no definite reason could be ascertained.

The presenting symptoms reflect irritation of the lower genitor-urinary tract with the most common being dysuria, lower abdominal and urethral pain, microscopic or gross hematuria, acute urinary retention, urethral discharge, and fevers (1-4). Diagnosis can frequently be determined by clinical

history and careful physical examination. Objects located distal to the urogenital diaphragm can typically be palpated directly, while objects proximal to the diaphragm are not readily palpable. If the diagnosis is unclear, radiopaque foreign bodies can be localized with plain X-ray film examination supported by endoscopic examination, while excretory urogram or cystograms and ultrasound imaging may reveal radiolucent objects.

The main objectives of treatment include diagnosing complications, foreign body extraction, and avoiding compromise of erectile function. Endoscopic manipulation and extraction utilizing forceps and snares, balloon-wires, and stone-retrieving baskets have been documented as successful in the removal of foreign objects located below the urogenital diaphragm. Due to the high incidence of co-morbid psychiatric disease, mental retardation, and dementia, it has been suggested that patients presenting in this manner have routine psychiatric evaluation, although this had not been universally agreed upon.

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LAPAROSCOPIC RADICAL PROSTATECTOMY BY EXTRAPERITONEAL ACCESS WITH DUPLICATION OF THE OPEN TECHNIQUE

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ABSTRACT

Introduction: The laparoscopic radical prostatectomy is a continually developing technique. Transperitoneal access has been preferred by the majority of centers that employ this technique. Endoscopic extraperitoneal access is used by a few groups, nevertheless it is currently receiving a higher acceptance. In general, the antegrade technique is used, with dissection from the bladder neck to the prostate apex.

The objective of the present paper is to describe the extraperitoneal technique with reproduction of the open surgery's surgical steps.

Surgical Technique: With this technique, the dissection of the prostate apex is performed and, following the section of the urethra while preserving the sphincteric apparatus, the Foley catheter is externally tied and internally recovered, which allows cranial traction, similarly to the way it is performed in conventional surgery. The retroprostatic space is posteriorly dissected and the seminal vesicles are identified by anterior and posterior approach, obtaining with this method an optimal exposure of the posterolateral pedicles and the prostate contour. The initial impression is that this technique does not present higher bleeding rate or difficulty level when compared with antegrade surgery. Potential advantages of this technique would be the greater familiarity with surgical steps, isolated extraperitoneal drainage of urine and secretions and a good definition of prostate limits and lateral pedicles, which are critical factors for preserving the neurovascular bundles and avoiding positive surgical margins. A higher number of cases and a long-term follow-up will demonstrate its actual value as a technical option for endoscopic access to the prostate.

Key words: prostatic neoplasms; prostatectomy; laparoscopy

Int Braz J Urol. 2004; 30: 221-6

INTRODUCTION

Laparoscopic radical prostatectomy has become an option for treatment of localized prostate cancer in some centers. The majority of laparoscopists prefer the transperitoneal technique that was standardized by Guilleneau & Vallencien (1).

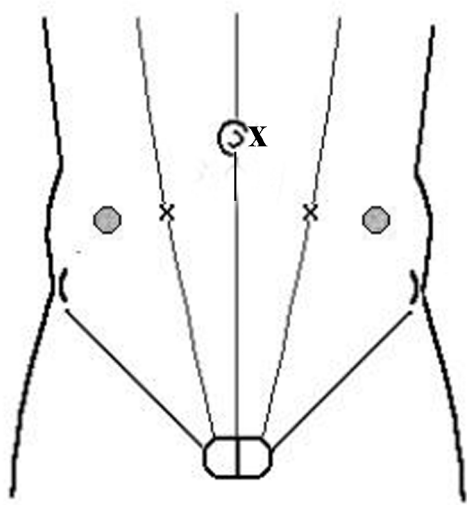
The endoscopic extraperitoneal technique performed by some groups promotes antegrade dissection, from the bladder neck to the prostate apex (2-4). Our objective was to describe the

extraperitoneal technique that was initiated in our institution in 2002 with duplication of open surgery's surgical steps, discussing potential advantages and initial impressions obtained after its use in 25 patients.

SURGICAL TECHNIQUE

1. Patient is positioned in horizontal dorsal decubitus, with Y-shaped abduction of lower limbs on the table;

2. Display of the surgical team. The surgeon operates on the left side, the camera is positioned at the upper end of the table, and the assistant stand at the patient's right side. During suture, for improved comfort, the surgeon and the camera switch places;
3. Umbilical incision measuring 1.5 cm up to the Retzius space;
4. Creation of extraperitoneal space through digital dissection and modified balloon dilator (handicraft);
5. Hasson trocar (10 mm) through the umbilical incision for the 0-grade optics;
6. Installation of pneumoretroperitoneum with CO₂ tension of 15 mmHg;
7. Introduction of another 4 working trocars (2 pararectal external measuring 10 mm, and 2 in iliac fossa measuring 5 mm) under direct view, in an arciform shape, taking care in order to avoid peritoneal lesion (Figure-1);
8. Exeresis of pre-prostatic fat with monopolar cautery for proper identification of prostate, bladder and puboprostatic ligaments;
9. Bilateral opening of endopelvic fascia with scissors, following previous contralateral traction of the prostate (Figure-2);
10. Identification and sectioning of puboprostatic ligaments (Figure-3);
11. Vascular control of dorsal vein complex of the penis with a X-stitch using 2-0 polyglactine suture with CT-1 needle (Figure-4) and control of the retrograde blood flow with harmonic or bipolar scalpel, or polymer clip (Hem-o-lock®) (Figure 5). Applying the clip makes the subsequent identification of the bladder neck easier for reconstruction, a surgical step that is often arduous when we choose to preserve the bladder neck;



RADICAL PROSTATECTOMY

Figure 1 – Display of trocars in arciform shape. The 0-grade optics is placed in the umbilical trocar. Two pararectal 10-mm ports and another 2 5-mm ones in iliac fossa complete the access. O = 5-mm trocar, X = 10-mm trocar

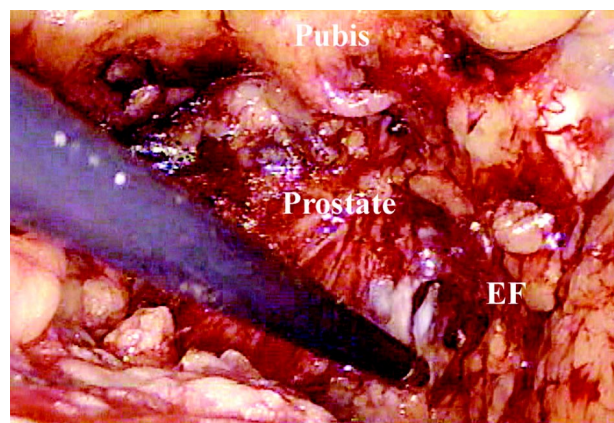


Figure 2 – Opening of endopelvic fascia (EF). The assistant pulls the prostate to the contralateral side and the surgeon sections the endopelvic fascia with scissors.

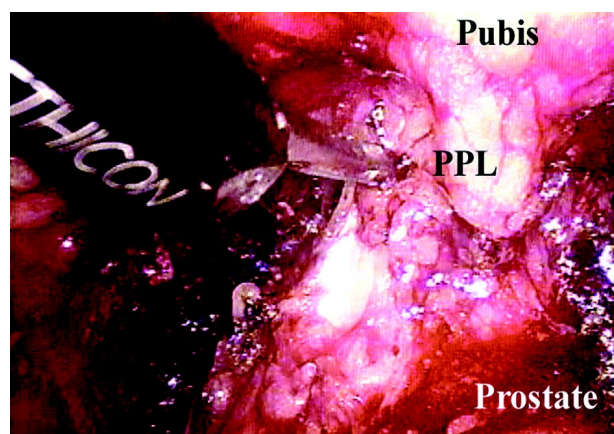


Figure 3 – Sectioning of the puboprostatic ligament (PPL) with harmonic scalpel.

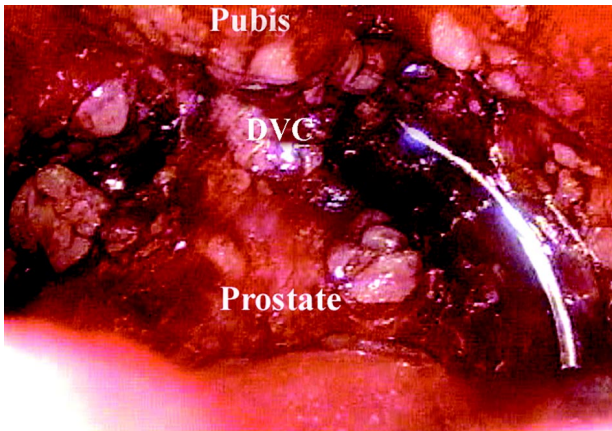


Figure 4 – Vascular control of the dorsal vein complex (DVC).

12. Apical dissection with preservation of the sphincteric apparatus;
13. Sectioning of the dorsal vein complex of the penis with electrocautery or harmonic scalpel, until the urethra is viewed (Figure-5);
14. Opening of the urethral anterior wall with scissors (Figure-6). Section is performed after perfectly identifying the limits of the prostate apex and urethra, thus avoiding positive margins;
15. The catheter balloon is filled with 20 mL of distilled water. The Foley catheter is externally pulled for subsequent knot application with 0-cotton suture including drainage and balloon routes;
16. Sectioning of the catheter close to the previously applied knot;

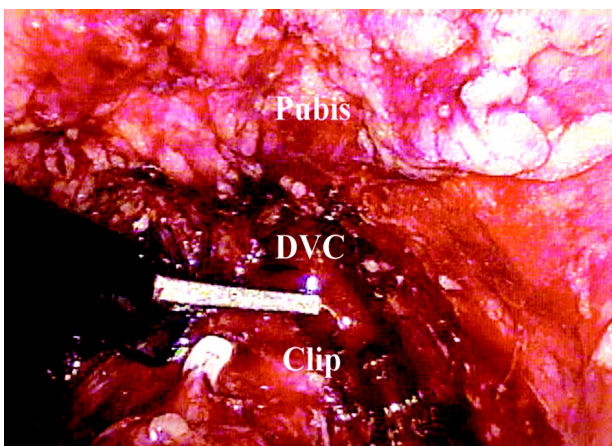


Figure 5 – Sectioning of dorsal vein complex with harmonic scalpel. Ligation of dorsal vein complex (DVC) with suture.

17. Recovery of the remaining stump of the Foley catheter, through endoscopic view in the extraperitoneal space (Figure-7);
18. Posterior section of the urethra and recto-urethral muscle following cranial traction of the stent by the assistant;
19. Blunt retroprostatic dissection up to the most proximal point as feasible;
20. Identification and opening of the posterior layer of the Denovilliers fascia (Figure-8). At this time it is possible to identify the pre-rectal fat. Analogically to open surgery, we know that the neu-

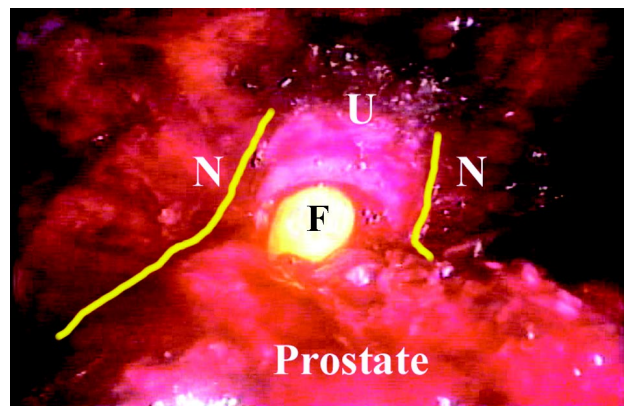


Figure 6 – Opening of the urethral anterior wall. Observe the Foley catheter (F) and the prostate apex, clearly identified. The path of the nervi erigentes (N), schematically identified with yellow lines, is located laterally to the sectioning area in the urethra (U).

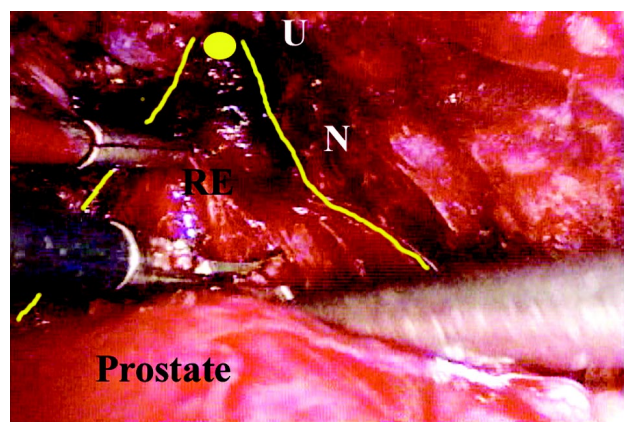


Figure 7 – Dissection of retroprostatic space. U = urethra (yellow circle), RE = retroprostatic space, N = projection of nervi erigentes (yellow line).

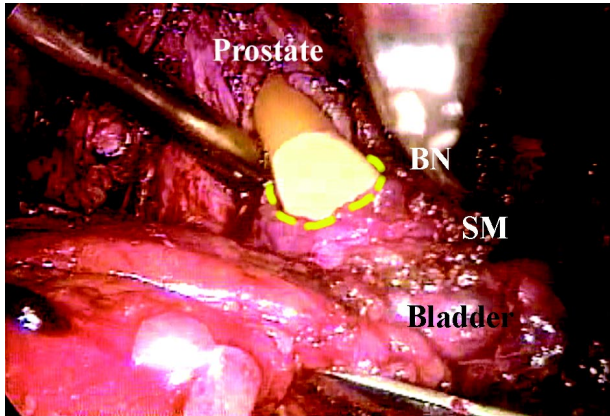


Figure 8 – Sectioning of bladder neck with harmonic scalpel preserving muscular fibers. As a result, we obtained a small diameter neck (dotted line), which makes future vesicourethral anastomosis easier. BN = bladder neck, SM = muscle fibers.

rovascular bundle lies laterally and under the fascia, which makes nervous preservation easier during ligation of the prostatic pedicle, which is performed by posterior access;

21. Sectioning of the bladder neck, with preservation of muscular fibers whenever possible. The dissection is started with harmonic or bipolar scalpel and upon reaching the urethral mucosa, it is sectioned with scissors (Figure-9);
22. Identification and opening of the anterior layer of Denovilliers' fascia, posterior to the prostate with visualization of vasa deferentia;
23. Identification and sectioning of vasa deferentia with harmonic or monopolar scalpel;
24. Superior traction of the vasa deferentia by the assistant in order to release the seminal vesicles. At this time, we preferred to use harmonic or bipolar scalpel in order to avoid dissipation of thermal energy that could damage the nervi erigentes;
25. The assistant performs the lateral and superior traction of previously mobilized (released) prostate, enabling the clear identification of the prostatic pedicles and the prostate capsular limits. The control of the prostatic pedicles is performed with harmonic or bipolar scalpel. Alternatively polymer clips (Hem-o-lock®) can be used (Figure-10);
26. Exeresis and entrapment of the specimen that is located in right iliac fossa;



Figure 9 – Identification and opening of the anterior layer of Denovilliers' fascia posterior to the prostate with viewing of vasa deferentia. P= prostate, DF= Denovilliers' fascia, VD= vas deferens.

27. Vesicoureteral anastomosis is initiated with the patient in Trendelenburg position in order to improve the visualization of the urethra. The surgeon works with the pararectal 10-mm trocars at the upper end of the table. We perform a continuous 3-0 polyglecaprone (monocryl®) suture with SH needle. We use two 13-cm sutures, one colorless and the other one violet, externally tied by the distal end. Suture begins at 6 o'clock position in the bladder directed inwards and each of the sutures rises toward 12 o'clock position, where a single internal knot is made (5);
28. Drainage with Penrose though one of the 5-mm ports;

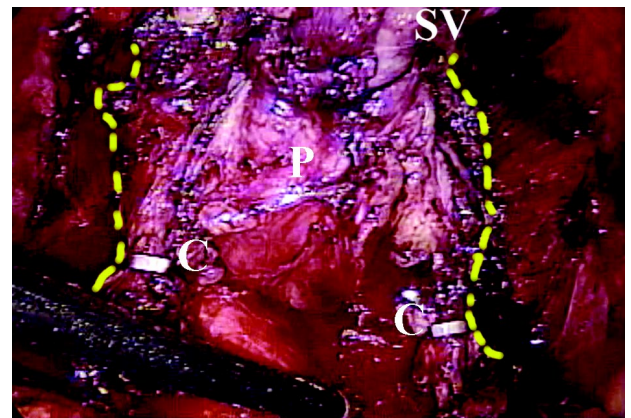


Figure 10 – The prostatic pedicles are identified and clipped. P = prostate. C = polymer clip. Observe the path of the nervi erigentes (dotted lines). SV = seminal vesicle.

29. Removal of the specimen by enlargement of the umbilical port and closure of the incisions;

COMMENTS

Laparoscopic radical prostatectomy is a laborious procedure with a long learning curve. The most significant series in literature, where it was possible to standardize and systemize the technique, use transperitoneal access (1).

The endoscopic extraperitoneal technique was initially described by Raboy et al. where, after creating the space and ligating the dorsal vein complex, the dissection was performed from the bladder neck to the prostate apex (antegrade). The author reported that this technical option resulted from the higher possibility of bleeding and technical difficulty if the early sectioning of the complex was performed (2). This observation is contrary to the results obtained in our initial series of 25 patients, where none required hemotransfusion or conversion to open surgery.

In our setting, Andreoni et al. were the first authors to report laparoscopic radical prostatectomy using the antegrade technique (3). Potential advantages of the extraperitoneal access are the non-manipulation of abdominal viscera, reducing the risk of direct or distant lesions, keeping the drainage of secretions isolated from the peritoneal cavity, greater familiarity with local anatomy, with the Trendelenburg exaggerated position being unnecessary (frequently required in the transperitoneal technique). As disadvantages it presents a working space with lower gas content, requiring greater adaptation for instrument movements and aspiration of secretions and smoke. If the space is not properly developed in its lateral area, according to previous descriptions, a higher tension in the vesicoureteral anastomosis can occur. Peritoneal perforation hampers, but does not prevent the surgery from being completed. If the progression in dissection is hard, it is possible to operate by transperitoneal approach following wide peritoneal opening (2-4).

Our initial impression is that transperitoneal and extraperitoneal techniques are equivalent concerning surgical time, blood loss, complications and post-operative recovery. However, in the

extraperitoneal technique, the presence of urinary fistula shows a better outcome, since there is no urine drainage to the peritoneal cavity, thus avoiding prolonged paralytic ileus.

As original modifications, in addition to the retrograde dissection as described in the open technique, we used a polymer clip in order to avoid venous reflux from the dorsal complex, which aids in the subsequent identification of the bladder neck during suture. The external handling and sectioning of the Foley catheter enabled the internal and superior traction by the assistant, similarly to the open technique for accessing the posterior aspect of the prostate. Such dissection makes the identification of lateral prostatic pedicles quite easier following the dissection of the bladder neck. The accurate identification of the prostate limits is fundamental for a proper preservation on the neurovascular bundles and to avoid the occurrence of positive margins.

Recently, Dubernard et al. (2003) described the first series of 143 patients using retrograde laparoscopic extraperitoneal technique. The authors conclude that in spite of presenting only preliminary functional results, the technique is promising and can potentially become the method of choice for laparoscopic radical prostatectomy (5).

From this initial work, we concluded that extraperitoneal access is feasible, being possible to practically duplicate surgical steps of the open surgery. The actual role and advantages of this surgery when compared with laparoscopic transperitoneal technique waits for future assessments in prospective studies with a higher number of cases.

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RENAL CELL CARCINOMA IN CHILDHOOD

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ABSTRACT

The renal cell carcinoma (RCC) rarely occurs in childhood. We report here 3 cases of RCC in children.

Two girls and 1 boy aged 14, 8 and 13 years old, respectively, presented with gross hematuria as their main complaint. They underwent ultrasonography and computerized tomography, which revealed unilateral renal tumor with lymph nodal involvement in all 3 cases. They were treated with radical nephrectomy associated with regional lymphadenectomy, with histopathology of RCC. Incomplete adjuvant radiotherapy was performed in 2 cases and no complementary treatment in the other one. All are disease-free in a period ranging from 9 to 77 months after diagnosis.

Radical nephrectomy associated with regional lymphadenectomy is the best treatment for RCC in childhood. The disease appears to have a less aggressive behavior in children.

Key words: kidney neoplasms; children; carcinoma, renal cell; nephrectomy
Int Braz J Urol. 2004; 30: 227-9

INTRODUCTION

The incidence of renal cell carcinoma (RCC) is estimated in 0.1% to 0.3% of all tumors and 1.8% to 6.3% of all malignant renal tumors in childhood (1).

No proper therapy has been defined for children with RCC. Surgery constitutes the main treatment and results in cure when the tumor is localized and completely resected. The importance of radiotherapy and immunotherapy is not clear and different chemotherapy regimens showed only minimal activity when tested in clinical trials (1).

The authors report 3 cases of RCC in childhood.

CASE REPORTS

Case 1

Fourteen year-old girl was seen in June 1997 with left renal colic and hematuria for 3 months. The

ultrasound (US) revealed a nodule in the upper pole of the left kidney, measuring 4.3 x 4.0 cm, with enlarged perihilar lymph nodes. The computerized tomography (CT) confirmed the findings. She underwent radical nephrectomy with regional lymphadenectomy in July 1997 with histopathological diagnosis of RCC in left kidney and lymph nodes involvement (4/4). The service of oncology initially indicated radiotherapy, which was terminated after the fourth session. The patient has been semestrally followed by US or CT and is disease-free.

Case 2

Eight years old girl was seen in November 2000 with hematuria for 30 days. A cystoscopy was performed with clot evacuation. The CT revealed a mass in lower pole of the right kidney with uretero-hydronephrosis. She underwent radical nephrectomy with regional lymphadenectomy in December 2000, with histopathological diagnosis of RCC in right kidney with capsular infiltration and the presence of 2

involved hilar lymph nodes. Radiotherapy was initially indicated by the oncology service, and terminated after the first session. She is disease-free.

Case 3

Thirteen years old boy, seen in February 2003 with hematuria for 8 months, hemoglobin of 9.3 mg/dL and US performed 30 days before, showed a right renal tumor, which was confirmed by CT (Figure-1). He underwent radical nephrectomy with regional lymphadenectomy (Figure-2) in March 2003, with histopathological diagnosis of RCC in right kidney, with predominance of papillary variant, with lymph node metastasis. He did not undergo any adjuvant therapy and is disease-free.

DISCUSSION

Recent studies showed that the RCC corresponds to 1.4% of renal tumors in patients under 4 years old, 15.2% between 5 and 9 years and 52.6% from 10 to 15 years old (2).

Palpable mass occurs in 38%, hematuria in 38% and abdominal pain in 50%, with the classic triad being found in only 6% of cases (3). Metastases occur in lungs (40-65%), liver (35-57%), bones (10-42%) or bladder, brain or pleura (7-15%) (2). Surgery constitutes the main treatment (1).

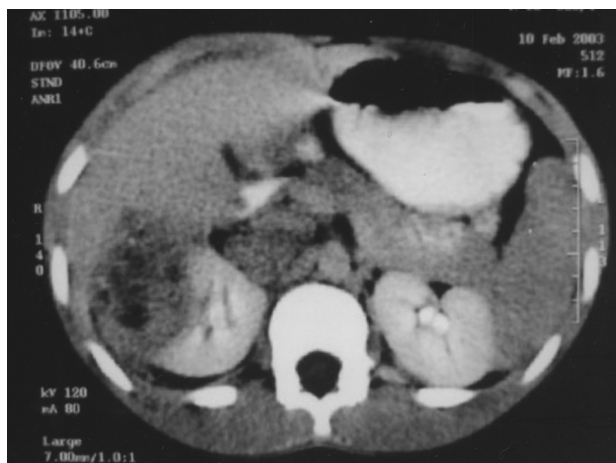


Figure 1 – Computerized tomography evidencing right renal tumor.

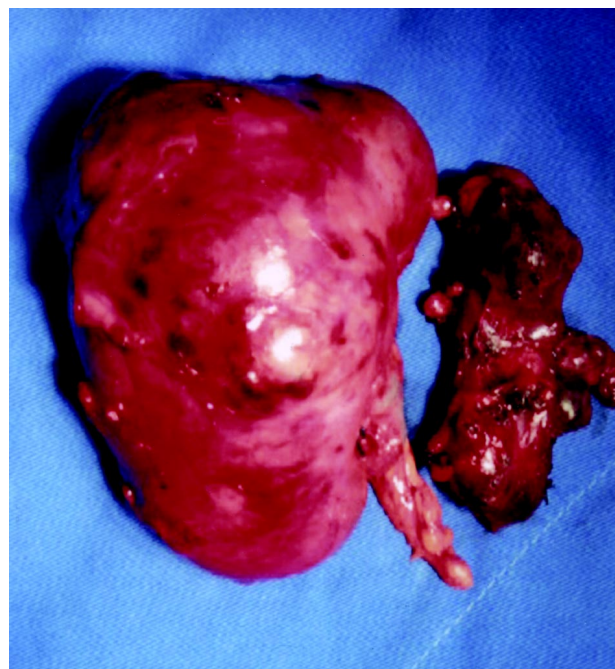


Figure 2 – Surgical specimen from right radical nephrectomy and regional lymphadenectomy.

Tumor staging is the most important prognostic factor. Overall 5-year survival is approximately 60%, with poor prognosis (9%) for stage IV (2).

Two of our patients started adjuvant radiotherapy. Since we did not find in the literature any incentive for such procedure, we decided jointly with the service of oncology to terminate it. Considering this fact and the good survival we achieved, we can agree with the unanimous opinion expressed in the works we reviewed, that radical nephrectomy associated with regional lymphadenectomy is the best treatment for RCC in childhood. Our results also suggest a less aggressive behavior of the disease in this age range.

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EDITORIAL COMMENT

The authors present 3 interesting cases of a rare pediatric tumor, that is renal cell carcinoma. Since the treatment with radiation therapy is not the standard of care, I do not know why they treated their patients with this therapy.

The authors say that the tumor has good prognosis in children, and I do not believe this is what the literature says. Also, they cannot base their conclusion on their limited experience with a short term follow up

(the authors stated that because one of their patients had advanced disease and is alive, this point to better prognosis in children). It is important to note that most patients with renal cell carcinoma do not have positive nodes, and that in the present series the incidence was higher than expected (even though again it is a limited experience). Also, it is important to remember that lymph node disease is known to significantly worsen the survival of patients with renal cell carcinoma.

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LAPAROSCOPIC BURCH SURGERY: IS THERE ANY ADVANTAGE IN RELATION TO OPEN APPROACH?

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ABSTRACT

Introduction: Surgery represents the main therapeutic modality for stress urinary incontinence. In incontinent patients with urethral hypermobility, the retropubic colposuspension by Burch technique is one of the surgeries that present better long-term results. Current trends towards performing minimally invasive techniques led proposing the Burch surgery through videolaparoscopy. The laparoscopic technique's long-term efficacy is a highly controversial issue. However, even if late results turn out to be satisfactory, the assumed advantages of laparoscopy (faster recovery, less pain, early return to daily activities, etc.) must be evident, in order to justify the use of this minimally invasive surgical access.

Materials and Methods: We reviewed our records and analyzed the medical charts of 26 female patients who underwent Burch surgery by open approach and 36 female patients by laparoscopic approach, between May 1999 and February 2001. The satisfaction level, surgical complication rates, surgery length, hospital stay and return to daily activities were analyzed.

Results: Mean age was 42 years, ranging from 27 to 68 years. Epidemiological data from both groups were not statistically different. Patients operated by laparoscopic route had a shorter hospital stay ($p = 0.002$) and a faster return to their daily activities ($p < 0.001$). However, there were no statistical differences in the following parameters: surgical time ($p = 0.11$), surgical complications ($p = 0.98$), patient satisfaction immediately ($p = 0.77$) and 90 days following surgery ($p = 0.84$), surgery acceptance ($p = 0.85$), indication of this surgery to a friend ($p = 0.93$) and score given to the procedure ($p = 0.68$).

Conclusions: Even if the efficacy of both methods is similar, we did not observe significant advantages of laparoscopic surgery over open surgery, concerning the recovery in recent post-operative period.

Key words: urinary incontinence, stress; urethra; surgery; retropubic; laparoscopic
Int Braz J Urol. 2004; 30: 230-6

INTRODUCTION

Stress urinary incontinence (SUI) in women is an entity that presents high prevalence and significant medical, social and psychological consequences. Surgery represents the most effective therapy and is commonly used for its treatment. It is fundamental to consider the type of SUI when choos-

ing the surgical technique. In patients with bladder neck hypermobility, retropubic colposuspension by Burch technique is one of the most used alternatives.

Current trends towards performing less invasive surgeries with shorter hospital stay period, lower indexes of complications and faster rehabilitation of patients led to the development of laparoscopic surgery. In 1991, Vancaille & Schuessler described

the Burch surgery by laparoscopic approach, performed with a technique similar to conventional surgery (1). Despite the assumed advantages of being a minimally invasive procedure, works analyzing the laparoscopic technique focus on assessment of efficacy and duration of long-term results. The efficacy of the laparoscopic procedure is quite controversial. However, even the results are similar for both techniques, it is still necessary to demonstrate the presumed advantages in patients' recovery. This issue is rarely discussed in the pertinent literature.

We performed an analysis of our casuistry in order to verify whether there is any advantage of videolaparoscopic surgery in relation to open surgery, using as parameters the satisfaction level, index of problems correlated to the surgical procedure, length of surgery and period of hospital stay and rehabilitation of patients.

MATERIALS AND METHODS

We performed a retrospective comparative study, analyzing 62 patients with SUI, undergoing surgical treatment in the period from May 1999 to February 2001. Burch technique by open approach was employed in 26 patients (42%) and laparoscopic Burch technique in 36 patients (58%).

All patients underwent a detailed clinical examination, as well as complementary tests. The patient profile was designed for each group according to the following criteria: age, previous surgeries for treating SUI, parity, hormonal condition, body mass index (BMI), presence of cystocele, rectocele, perineal rupture and uterine prolapse. Patients were regarded as having genuine SUI due to urethral hypermobility when the urodynamic study showed leak point pressure superior to 90 cm H₂O. Intraoperative and postoperative data such as surgical time, associated surgeries and hospitalization period were assessed. We also evaluated the complications occurring intraoperatively and on the 7th, 30th and 90th postoperative day. We considered as intercurrents abdominal pain (when the use of analgesics were required), problems with surgical wound (infection, hematoma, dehiscence), fever, urinary tract infection, urinary retention or persistence of urinary loss symptoms (recurrence).

Burch surgery by open approach was performed with the patient in lithotomy position, through Pfannenstiel incision. Retzius space was extraperitoneally dissected, allowing approaching the urethra, bladder neck and Cooper's ligament, aided by the identification of the vaginal culs-de-sac through presentation with vaginal mounted gauze and palpation of the 18F vesical catheter balloon. Then 2 or 3 stitches were applied with 2-0 polygalactine suture between the vaginal dome, at the level of bladder neck, and Cooper's ligament. The laparoscopic technique was performed by transperitoneal approach through 3 punctures: 10-mm puncture in the umbilicus (optics) plus another 2 auxiliary punctures in McBurney's point, to the right (5 mm) and its mirror-image point to the left (10 mm). All other steps were similar to open surgery (2,3). Two stitches were applied on each side of the bladder neck in all patients.

As a criterion to objectively assess surgical outcome during post-operative follow-up, all patients underwent a rigorous physical examination with direct visualization of urine loss through the urethra following stress maneuvers, with the patient standing and with vesical repletion. An inquiry about the satisfaction level was also conducted, questioning if they would perform again the same procedure and if they would indicate the procedure to other persons. Once the patients answered the questions, we asked them to give a score (from 0 to 10) concerning the treatment employed.

The statistical analysis was made with the Epi info 2000® software using the qui-square test (χ^2) and the Fisher's exact test with 95% confidence interval ($p < 0.05$) for all the assessed parameters.

RESULTS

Concerning patient age, we had as average 42 years, ranging from 27 to 68 years. No statistical difference was observed between the 2 groups when we assessed parity (average of 5 vaginal deliveries), hormonal conditions and body mass index, as well as the presence of vaginal dystopias (95% of patients presented some degree of cystocele and 75% some degree of rectocele). Three patients (8%) undergoing laparoscopic surgery and 2 (7%) undergoing open

LAPAROSCOPIC BURCH SURGERY

surgery reported previous surgical treatment for SUI (Table-1).

Mean surgical time was 172 minutes, with 186 minutes being the average for laparoscopic surgeries and 153 the length of open ones. One or more associated surgical procedures were performed in 20

patients (77%) undergoing open surgery and 35 (97%) undergoing laparoscopy (Tables-2 and 3).

There were 4 (11%) intraoperative surgical interurrences in the laparoscopic group (3 bladder lesions and one colon perforation) and 1 (4%) case in the open group (bladder lesion), ($p = 0.93$, $\chi^2 = 0.33$).

Table 1 – Assessment of parity, hormonal condition, body mass index, vaginal dystopias and previous surgical treatment of patients studied.

Parameter	Variable	Laparoscopic Burch n = 36	Open Burch n = 26	p Value
Parity	Below or equal to 5	26 (72.2%)	17 (65.4%)	0.6
	Above 5	10 (27.8%)	9 (34.6%)	
Hormonal condition	Menacme	25 (69.4%)	16 (51.5%)	0.3
	Menacme + oral anticonceptive	5 (13.9%)	2 (7.7%)	
	Climacteric period with hormonal replacement	5 (13.9%)	4 (15.4%)	
	Climacteric period without hormonal replacement	1 (2.77%)	4 (15.4%)	
Body mass index	BMI < 25	12 (33.3%)	5 (19.2%)	0.4
	BMI 25 to 30	19 (52.8%)	15 (57.7%)	
	BMI > 30	5 (13.88%)	6 (23.1%)	
Vaginal dystopias	Cystocele absent	2 (5.5%)	1 (3.8%)	0.7
	Cystocele present	34 (94.5%)	25 (96.2%)	
	Rectocele absent	9 (25%)	7 (26.9%)	0.9
	Rectocele present	27 (75%)	19 (73.1%)	
Perineal Rupture	Absent	9 (25%)	5 (19.2%)	0.3
	Incomplete	7 (19.4%)	2 (7.7%)	
	Complete	20 (55.6%)	19 (73.1%)	
Previous surgeries	Occurred	3 (8.3%)	2 (7.7%)	0.9
	Did not occur	33 (91.7%)	24 (92.3%)	

Table 2 – Number of surgical procedures associated with Burch surgery.

	1 Procedure	2 Procedures	3 Procedures
Open Burch Surgery	14	5	1
Laparoscopic Burch Surgery	19	15	1

LAPAROSCOPIC BURCH SURGERY

Table 3 – Types of surgical procedures associated with Burch surgery.

	Posterior Colpoperineoplasty	Tubal Ligation	Hysterectomy	Annexectomy	Others
Open Burch Surgery	19	5	2	2	2
Laparoscopic Burch Surgery	30	10	4	1	2

In relation to the hospitalization period, we observed an average of 3 days, lower in the group undergoing laparoscopic surgery (statistically significant), Table-4.

When analyzing the postoperative results, 59 patients (95.16%) reported being dry or having minimal urinary loss, with no statistically significant difference between the 2 groups (Table-5).

Tables-6, 7 and 8 show the complications at 7th, 30th and 90th postoperative days.

Table 4 – Hospitalization time of patients undergoing Burch surgery (mean 3 days) ($\chi^2 = 13.25$, $p = 0.002$).

	≤ 3 days	> 3 days
Open Burch Surgery	11	13
Laparoscopic Burch Surgery	31	5

Table 5 – Assessment of patients on the 90th postoperative day ($\chi^2 = 0.70$, $p = 0.77$).

	Dry / Better	Equal / Worse
Open Burch Surgery	24	2
Laparoscopic Burch Surgery	35	1

Table 6 – Presence of complications until the 7th postoperative day ($\chi^2 = 17.48$, $p < 0.001$).

	With Complications	Without Complications
Open Burch Surgery	17	7
Laparoscopic Burch Surgery	5	31

When questioned on the 90th postoperative day about satisfaction with surgical treatment, 30 patients (83%) from laparoscopic group and 23 (86%) undergoing open surgery were satisfied, with no difference between groups ($p = 0.84$, $\chi^2 = 0.319$). Thirty-three (91.66%) patients from laparoscopic group and 25 (96.15%) patients from open surgery group would accept to undergo a hypothetical reintervention ($p = 0.85$, $\chi^2 = 0.503$). Thirty (83%) patients from laparoscopic group and 21 (81%) from open group would indicate this kind of surgical procedure to a friend presenting the same clinical situation, with no difference between groups ($p = 0.93$, $\chi^2 = 0.068$).

When asked to give a score from 0 to 10 to their surgeries, 30 (83%) patients from laparoscopic group and 20 (77%) from open surgery group indicated a score between 8 and 10 (Table-9).

Table 7 – Presence of intercurrents until the 30th postoperative day ($\chi^2 = 6.36$, $p = 0.01$).

	With Complications	Without Complications
Open Burch Surgery	11	13
Laparoscopic Burch Surgery	5	31

Table 8 – Presence of intercurrents until 90th postoperative day ($\chi^2 = 0.96$, $p = 0.32$).

	With Complications	Without Complications
Open Burch Surgery	7	19
Laparoscopic Burch Surgery	6	30

Table 9 – Which score would you give to your surgery?
($\chi^2 = 0.74$, $p = 0.68$).

	0 - 4	5 - 7	8 - 10
Open Burch Surgery	3	3	20
Laparoscopic Burch Surgery	4	2	30

DISCUSSION

Burch colposuspension surgery (4) has been the procedure of choice for many gynecologists and urologists for treating SUI due to the good long-term results observed. The same surgery, performed by laparoscopic approach, is gaining popularity because it supposedly presents advantages such as, smaller incisions with better esthetic results, easier access to Retzius space, improved visualization of the surgical field, minimal intraoperative blood loss and lower requirement of analgesics in the postoperative period, in addition to lower cost, shorter hospital stay and rehabilitation period of patients (5-7). Many authors describe cure rates for laparoscopic Burch surgery similar to those obtained with open technique, however with comparatively shorter follow-up (8-11).

The literature contains descriptions of several modifications and technical facilities (staplers, bone fixators, synthetic meshes, biological glues) used in an effort to make the performance of laparoscopic Burch surgery easier and faster and, consequently, more accessible to surgeons (8). Many of those surgeries, due to their extensive modifications, should not even be referred to as Burch surgery (3). However, no definitive conclusion has been drawn about such modifications. It is not known if they impair the efficacy that was previously established for the open technique, since global results are quite controversial. For example, McDougall et al., observed success in only 30% of patients operated by modified technique with staplers (using polyester suture fixed by clip instead of stitches), in a 36-months follow-up (12). There are several other conflicting results in the literature about the efficacy of laparoscopic technique, as well as its comparison with the open technique. Lose reviewed 15 works on laparoscopic Burch sur-

gery and found a wide technical variability in the technique employed and cure criteria, with only one work being prospective and randomized (13).

Su et al., when analyzing 92 operated patients (46 by laparoscopy and 46 by open surgery), observed that surgical time was similar, however the cure rate was lower with laparoscopic approach, corresponding to 80% in laparoscopy and 96% in open surgery. Complication rate was 11% and 17%, respectively (14). Kohli et al. observed a shorter surgical time with laparoscopic approach (110 minutes versus 66 minutes). Hospital stay was longer with open route (mean 2.1 days versus 1.3 days). There were no intraoperative interferences in any group (15).

In a retrospective study, conducted by Miannay et al. (16) comparing both techniques in 72 patients, a shorter surgical time was observed with open approach. However, patients reported a lower pain index with laparoscopic approach, requiring less postoperative analgesia. Hospital stay was also shorter with laparoscopic approach (mean 3 days with laparoscopy versus 6.3 days with open surgery). Cure and improve rates after 1 year, respectively, were 79% and 85% for laparoscopy, and 69% and 82% for open surgery. After 2 years, cure and improve rates dropped to 68% and 80% for laparoscopy, and to 64% and 75% for open surgery, showing a decrease in cure index when patients were assessed for a longer period.

Another comparative work was performed by Das using 10 patients operated by laparoscopy and 10 by open approach. They demonstrated a lower requirement for analgesia, shorter length of vesical stenting and shorter hospital stay with laparoscopic approach. However, the healing index after 10 months was 100% for open surgery and 90% for laparoscopy. After 36 months, this index dropped to 50% and 40%. Satisfaction level, however, was superior with laparoscopic surgery, corresponding to 60% in open surgery and 90% in laparoscopic surgery (17).

On the other hand, Saidi et al. retrospectively studied 70 patients undergoing laparoscopy and 87 undergoing open surgery, with a mean follow-up of 15 months, and described a shorter surgical time, shorter hospital stay and faster rehabilitation in laparoscopic group. Cure and complication rates (91%

in laparoscopic group and 92% in open surgery group) were similar (18).

Moehrer et al. performed a systematic review of the literature, searching only the best evidences (randomized clinical trials) that analyzed laparoscopic Burch surgery. They suggest that the method can provide faster recovery, but with higher risk of complications. However, evidences are weak and prospective randomized works are required to better clarify this issue (19).

In spite of this discussion, works did not clearly analyze whether laparoscopic surgery actually represents an advance for the patient, upon perceiving that it is a less invasive procedure.

In our study, we observed that 83% of patients undergoing laparoscopy and 61.5% undergoing open surgery were free of urinary symptoms 90 days after surgery. When added to symptoms improvement, which for patients indicates surgical success, these values rise to 97% and 92%, respectively. Obviously, a long-term follow-up is required for these patients, in order to verify the maintenance of such indexes, since several studies demonstrate deterioration in results with time.

However, if we analyze the initial results, aiming to assess morbidity and faster recovery of patients, it is not clear if laparoscopic surgery is more advantageous. Intraoperative complications occurred in 11% of laparoscopic surgeries and 3% of open surgeries. Bladder lesion was the most prevalent complication, followed by one case of colon perforation. These figures are compatible with literature (20).

When assessing the presence of complications on 7th, 30th and 90th PO days, we observed that with open approach there is a significant decrease in the complication rate. On the 7th PO day, there was a statistically significant difference in complications between the 2 techniques. Such difference decreases on the 30th PO day, becoming statistically non-significant on the 90th PO day. We can conclude that laparoscopic surgery provided, in addition to shorter hospital stay, better rehabilitation in the first ninety days following the procedure. However, we observed that this shorter hospital stay and better convalescence had no impact on the assessment of satisfaction by the patients concerning their surgeries,

generally evaluated as satisfactory. These findings can be associated with the fact that, in surgical procedures on the lower abdomen, with extraperitoneal access, the impact for the patient is already naturally low. Thus, the performance of laparoscopic method may not bring the expected benefits of a minimally invasive procedure. Prospective randomized studies are required to clarify this issue and to determine whether there is any advantage of laparoscopic Burch surgery or not.

CONCLUSION

Laparoscopic and open approaches for performing Burch surgery have similar short-term cure indexes, as well as similar occurrence of complications and satisfaction level of patients, with hospital stay and rehabilitation period being lower in those who are operated by laparoscopic approach. However, in the patient's point of view, laparoscopic Burch surgery did not present significant advantages in relation to open surgery in the population under study.

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TOTAL BLADDER REPLACEMENT WITH DE-EPITHELIALIZED ILEUM. EXPERIMENTAL STUDY IN DOGS

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ABSTRACT

Objective: To assess the value of the silicone modeler in preventing graft retraction in dogs undergoing bladder replacement with de-epithelialized ileum.

Materials and Methods: Twelve female dogs underwent total cystectomy and bladder replacement by neobladder made of demucosalized ileal segment, comparing the group with modeler (group I) and the group without modeler (group II). Cystometry data, graft epithelization and radiological assessment (cystography and excretory urography) were analyzed.

Results: Neobladder capacity, at 2 months, ranged from 50 to 250 mL (mean 191 mL) and from 5 to 60 mL (mean 22 mL) and at 6 months, from 60 to 270 mL (mean 202.5 mL) and from 5 to 75 mL (mean- 30.5 mL), respectively in groups I and II, with a statistically significant difference between groups. After 30 days, postoperatively the presence of transitional epithelium was observed in all fragments obtained by biopsy.

Conclusion: The use of the intravesical silicone modeler prevented the retraction of the neobladder of de-epithelialized ileum.

Key words: bladder; ileum; epithelium; prostheses and implants

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INTRODUCTION

Efforts to augment or replace the bladder are old (1,2), and most commonly digestive tract segments were used for this purpose (3). Considering, however, the characteristics of intestinal mucosa, structurally and functionally distinct from the bladder, problems such as production of secretions, infection, electrolytic changes and even developing of tumors still await for a definitive solution (4). Thus, in order to overcome such difficulties, some authors suggested using de-epithelialized flaps of digestive tract (5-7). Martin used a Foley stent balloon aiming to distend the de-epithelialized graft (7). Other authors have tried to reproduce experiments with de-epithelialized segments of the digestive system (8-10).

Given the mucosecreting and absorbing nature of the digestive epithelium, problems resulting from mucous secretion and metabolic changes are, sometimes, difficult to solve (11). Intestinal neobladder could be made with digestive tract segments lacking their original mucosa (de-epithelialized) over which a layer of transitional epithelium would develop, whether from the original bladder or from grafted islets of transitional epithelium (5-7). Our studies with de-epithelialized colon have allowed for improving bladder capacity through the use of a silicone modeler placed inside the neobladder and submitted to a slight distension. This distension allows the de-epithelialized flap not to retract, and thus it can undergo the epithelization process from the existing bladder (12).

The present study applies the de-epithelialized ileal segment for bladder replacement and analyzes the role of the silicone modeler in preventing graft retraction and in its epithelization.

MATERIALS AND METHODS

Animals underwent total cystectomy and bladder replacement by neobladder of demucosalized ileal segment, comparing the group with modeler (group I) and the group without modeler (group II). Graft epithelization, cystometry data and radiological assessment (cystography and excretory urography) were analyzed.

The research project was approved by the Committee for Research Ethics from the Health Science Center of Federal University of Pernambuco.

Twelve cross-bred female dogs, apparently healthy, weighting between 13 and 27 kg (mean 16 kg/median 16.5 kg) were operated, among which 10 survived for longer than 60 days and were used for this study.

All animals were operated and maintained at the Nucleus of Experimental Surgery of Federal University of Pernambuco. On the first postoperative day they were fed with a liquid meal, which was advanced to solid meals according to each animal's acceptance. All animals were maintained on therapeutic antibiotic treatment with gentamicin (80 mg/day) for 10 days following each manipulation, and from then on, prophylactic therapy with nitrofurantoin (100 mg/day) until death.

Surgical Technique

Animals were weighted and underwent puncturing of the radial vein in one of the front paws, with 19 or 21 butterfly-type needle. They underwent intravenous anesthesia with ketamine (1 mg/kg), fentanyl citrate (1 mg/kg) and pentobarbital sodium (25 mg/kg). After being positioned in dorsal decubitus, the animals were intubated with an orotracheal tube and maintained under controlled ventilation, using the muscle relaxant pancuronium bromide (1 mg/kg). All animals received between 30 and 50 mL/kg/h of 0.9 % physiological saline solution or Ringer lactate, during surgery.

The access approach was median laparotomy measuring approximately 20 cm, until the pubic symphysis. Following the inspection of every abdominal organ, a 45-cm ileal segment with suitable vascular pedicle was isolated (Figure-1 A), and intestinal transit was reconstituted by termino-terminal ileum-ileal anastomosis, with continuous sutures in 2 planes, using 3-0 chromic catgut suture for the mucosa and 4-0 prolene for seromuscular layer.

The isolated ileal segment had its seromuscular layer separated from the mucosa, as following. Inserting a 14 or 16F Foley catheter within the lumen and insufflating the balloon with 10 mL of distilled water. Blunt dissection with Kelly forceps, and separation of seromuscular layer from the mucosa, on the segment ileal supported by the stent balloon, and longitudinal section on the anti-mesenteric aspect of the seromuscular layer. In order to start the dissection, close to one of the extremities of the isolated ileal segment, with the stent balloon inflated, a circular incision of the seromuscular layer was performed around the entire ileum circumference (Figure-1 B) with 15-blade scalpel. Using the Kelly forceps, the seromuscular layer was separated from the mucosa, with the procedure being complete when the other extremity was reached (Figure-2). Electrocautery was used for hemostasia. Simultaneously, the de-epithelialized area was irrigated with distilled water at a temperature of 5°C, through a 20-mL syringe with insulin needle, in order to promote vasoconstriction.

Upon completing the dissection, the mucosa layer was discarded, the ileal segment of the seromuscular layer was configured into an U-shape, and the edges were closed by continuous stitches with 4-0 chromic catgut suture, so that it nearly formed a demucosalized bowel plate (Figure-3).

Bladder was sectioned at the level of the bladder neck. Ureteral distal ends were dissected and sectioned at the level of their insertion in the bladder. In the region more proximal to the urethral orifice, an orifice measuring approximately 1.5 cm in diameter was confectioned by suturing the edges of the de-epithelialized ileum, and the anastomosis with the urethra was performed. Suture consisted in separate stitches in 4-0 chromic catgut.

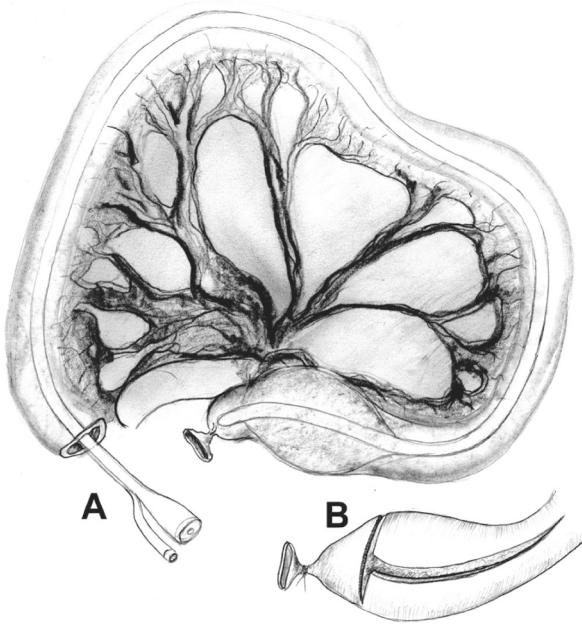


Figure 1 – A) Identification of the ileal segment to be used. B) Detail of seromuscular incision over Foley catheter balloon.

Ureters were anastomosed in the most cephalic region of the ileal plate, with 5-0 monofilament PDS suture in separate stitches. An orifice measuring approximately 0.5 cm in diameter was made in the ileal wall, passing 1.5 cm of ureter that was fixed to the internal aspect (de-epithelialized aspect), keep-

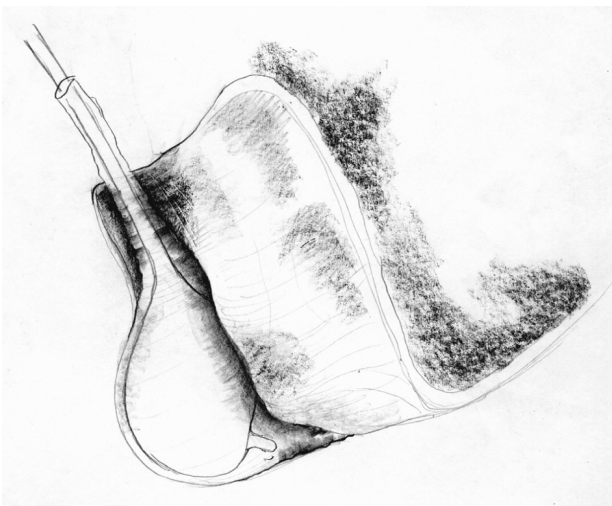


Figure 2 – Final of dissection separating the seromuscular layer from the mucosa.

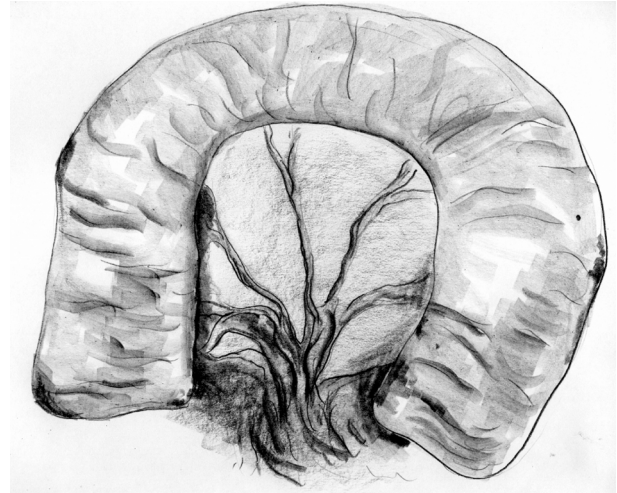


Figure 3 – Ileal segment detubularized and configured to serve as neobladder

ing the catheterization with 4F plastic urethral catheter (Figure-4). The extremity of the catheter was left inside the urethra in a silicone tube.

The edge of the ileal plate was fixed with 4-0 chromic catgut suture in continuous stitches, so that the neobladder was configured into a seemingly spherical shape. After sorting within groups, in the animals from group I, an empty silicone modeler was inserted (Figures-4 and 5).

The silicone modeler was inflated and maintained with 100 mL of physiological saline solution, after completing the suture and the neobladder confection (Figure-6). The modeler valve was placed in the subcutaneous tissue of the abdominal wall, close to the incision. In the animals from group II, the ileal plate was sutured similarly to group I, though without the modeler.

Closure of the abdominal wall was performed by planes, with separate stitches. The reversion of neuromuscular block was achieved with atropine (0.01 mg/kg) and neostigmine (0.03 to 0.07 mg/kg). The orotracheal tube was removed following the return to spontaneous breathing.

Postoperative period

For surgical procedures and postoperative assessment examinations, sedation and analgesia were performed with ketamine (1 mg/kg) and fentanyl citrate (1 mg/kg) by intravenous approach.

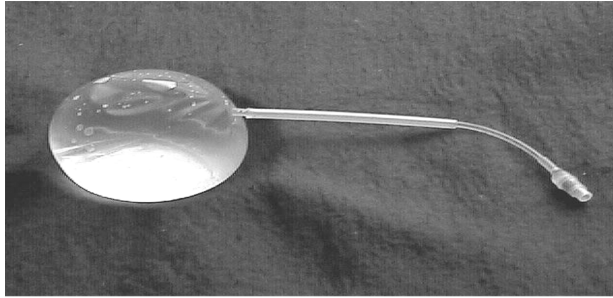


Figure 4 – Vesical silicone modeler.

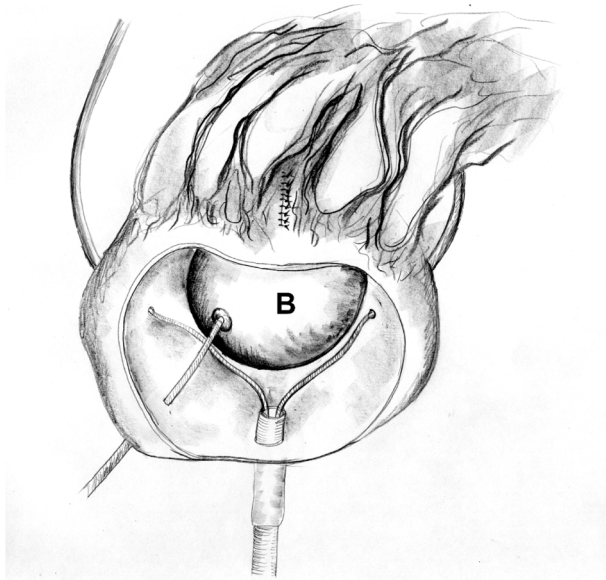


Figure 5 – Reimplantation of ureters. Note catheters in the ureters. The silicone balloon (B) is partially insufflated.

The silicone modeler was removed on the 14th postoperative day through a small abdominal incision measuring approximately 3.0 cm at the level of the modeler valve, which was in the subcutaneous tissue. After being totally emptied through its valve, the modeler was pulled and removed. The ureteral catheters were also removed at the same occasion by pulling them through the urethra.

The morphologic-functional assessment of the neobladder was performed through radiological study (excretory urography and cystography), cystometry and cystoscopy with biopsy of the graft wall. Cystometry and cystoscopy with biopsy were performed on the same occasion, monthly.

Cystometry

The cystometry was performed before the biopsy. A 10F nelaton catheter was inserted, the neobladder was emptied, and residual urine was measured. Through a second nelaton catheter connected to an external system of the hydration equipment, assembled on a stand with measuring tape, 0.9% physiological saline solution was infused at an approximate rate of 25 mL/min. Intravesical tension was measured in H₂O column (cm), from the point zero, which was settled at the level of the pubic symphysis, with the animal in dorsal decubitus. The container of physiological saline solution was located at 30-cm height from the point zero. All infused volumes and corresponding pressures were measured at every 5 mL of infusion and put on a graphic. The maximum vesical capacity was considered when fluid extravasation started around the urethral catheter, while infusing the solution. For comparison between groups, the capacity at 2 and 6 postoperative months was considered.

Cystoscopy with Biopsy

Following the cystometry, a cystoscopy with biopsy was performed, using a 21F sheath cystoscope and flexible biopsy forceps. Neobladder biopsies were performed on the lateral wall, fundus and regions close

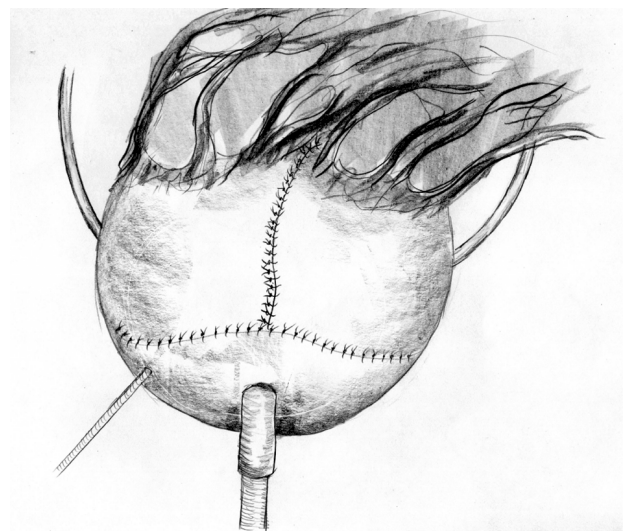


Figure 6 – Final aspect after placement of the balloon that was insufflated with 100 mL of physiological saline solution.

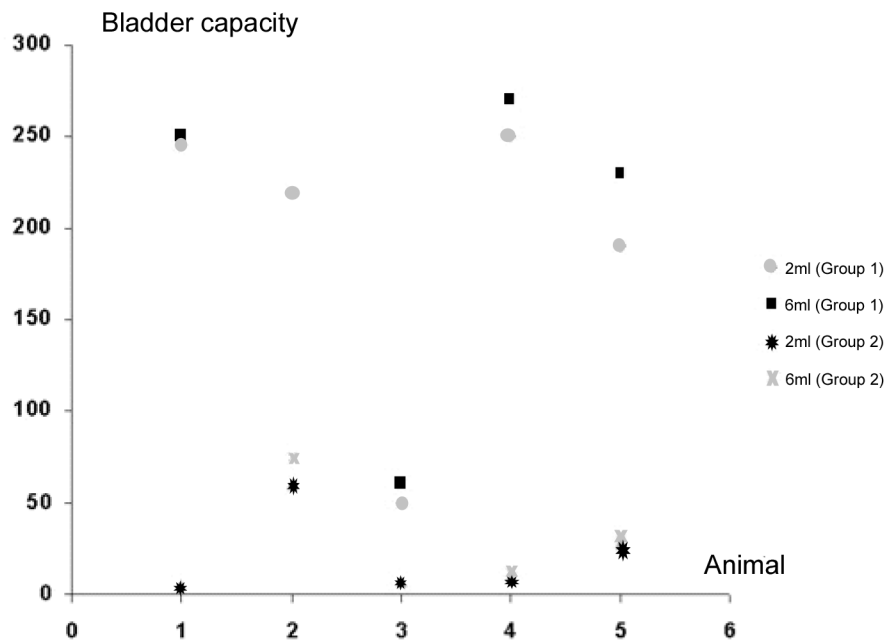


Figure 7 – Bladder capacity of animals from both groups, at 2 months and at 6 months.

to the ureters. Samples were identified, placed in different containers, fixed in 10% formalin, and processed as usual for histological study. When the animal died, the necropsy was performed with histological analysis of the entire urinary tract.

Cystography and excretory urography were performed 2 or 3 times during the study. In some animals, the urography was not performed.

Statistical Study

The Student's t-test was used to compare neobladder capacity in animals with and without the

use of silicone modeler, with the significance level set at 0.05 or 5%, for assessments at 2 and 6 months.

RESULTS

Two animals died within the first month following surgery. The main cause was peritonitis due to urine extravasation. Ten animals, 5 in each group, survived for more than 2 months; and eight (4 in each group) survived for more than 6 months. Mean survival in group I was 268.4 days (median 330) and in group II it was 253.6 days (median 240).

Table 1 – Bladder capacity (mL) of animals from groups I and II at 2 and 6 months.

Group I			Group II		
Animals	2 months	6 months	Animals	2 months	6 months
1	245	250	1	5	-
2	220	-	2	60	75
3	50	60	3	7	5
4	250	270	4	10	12
5	190	230	5	28	30

Table 2 – “t” test according to bladder capacity (mL) at 2 months.

Statistics	Group I	Group II
Mean	191	22
Variance	6780	534.5
Observations	5	5
Degrees of freedom	5	5
t Statistics	4.418546	
P (T ≤ t) one-tail	0.003451	
T critical one-tail	3.36493	

Table 3 – “t” test according to bladder capacity (mL) at 6 months.

Statistics	Group I	Group II
Mean	202.5	30.5
Variance	9291.7	991
Observations	4	4
Degrees of freedom	4	
t Statistics	3.392388	
P (T ≤ t) one-tail	0.013735	
T critical one-tail	2.131846	

Cystometry

Results for neobladder capacity and statistical study are presented, respectively, in Tables-1, 2 and 3. The evolutionary bladder capacity for each animal from groups I and II, at 2 and 6 months, is represented in Figure-7.

Radiological Assessment

Cystographies showed suitable and oval-shaped neobladders in animals from both groups, with neobladders in group I being visually larger than those in group II (Figures-8 A and B).

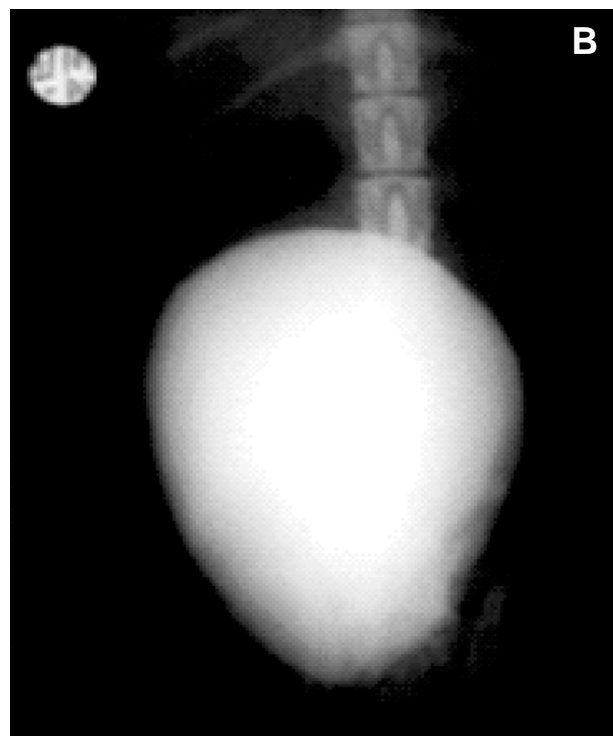


Figure 8 – A) Radiological aspect of bladder in control group. B) Radiological aspect of bladder in the group that used intravesical expander.

Histological Study

Transitional epithelium was observed in all fragments obtained by biopsy, both at 30 days post-operatively, and in subsequent ones, in all animals from both groups (Figure-9).

DISCUSSION

The use of de-epithelialized and balloon-protected intestinal segments had been previously reported in experimental animals. The type of material employed by the researcher (latex Foley stent balloon) was probably improper and limited his studies (7).

Studies for bladder augmentation similar to ours were conducted almost simultaneously by Australian researchers (8). They used de-epithelialized

sheep stomach and reported results similar to those obtained in our initial studies with sigmoid colon.

Jednak et al. used a model with sigmoid colon also similar to our initial model, though preserving the submucous layer of the bowel (13). They studied 16 patients, 14 with neurogenic bladder and 2 with sequelae from posterior urethral valve and reported a 2.4 times increase in bladder capacity. Filling pressures decreased by an average of 50%. Postoperative endoscopic biopsies revealed the presence of colonic epithelium in 3 cases. Four patients required reintervention, with 2 requiring a new augmentation. In an effort to extend the technique of de-epithelialized bowel for use in cases of small bladders or cases of vesical extrophy, some laboratories tried alternative methods for applying these grafts. Merguerian et al. used de-epithelialized grafts of sigmoid colon covered with grafts of cultured transitional epithelium covered by polygalactine (14). Despite the positive results of “in vitro” epithelial seeding, there was no growth when it was applied “in vivo”. More recently, Frey et al. used a similar model in mini-pigs. De-epithelialized bowel or stomach were grafted with urothelium islets, removed at the moment of surgery or collected from another animal. Severe contracture of the intestinal graft was observed in all cases (15).

In our study, catheterization of both ureters with the purpose of avoiding contact of urine with the graft seems to have a great importance and facilitates epithelial growth. The idea of maintaining the vesical modeler for 2 weeks is, to a certain extent, casual, since there is only one previous report in this sense, however only one animal was studied (7).

There is a recent study in rats where a silicone “stent” was used inside an augmented bladder obtaining results similar to ours (16).

In relation to the mortality observed in some animals in our study, we attribute it to the fact that dog bladder, as in the majority of animals, is located intraperitoneally and it favored urosepsis, which was triggered by urine extravasation. Similar complications were observed by other researchers in different time periods (5,16).

Despite such mortality, we could study in detail the surviving animals through monthly bladder biopsies and, considering that we had animals that

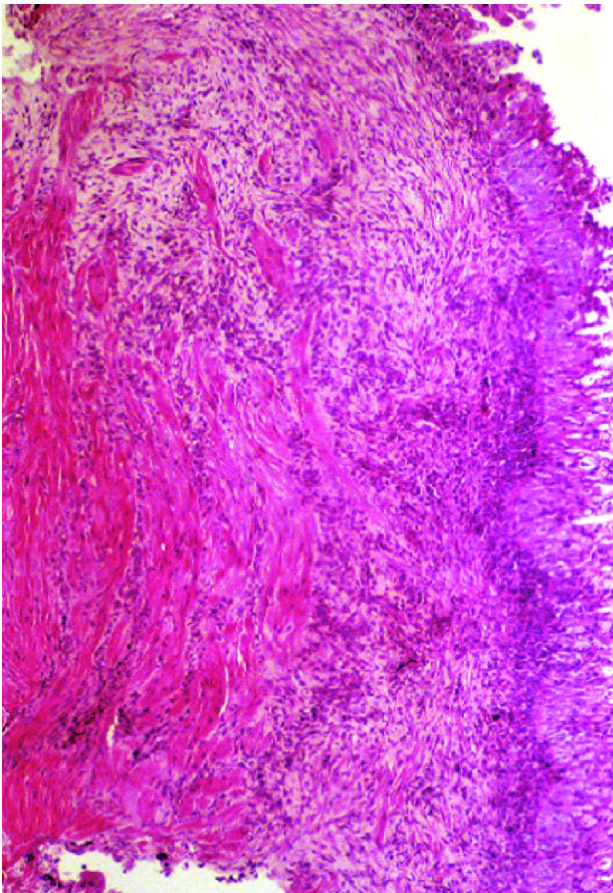


Figure 9 – Histological slide showing growth of stratified epithelium and preservation of musculature (HE).

survived up to 12 months, the opportunity of performing multiple biopsies in different occasions on the same animal, makes the apparently low number of animals in each group to be projected as a quite more significant number when we imagine that each animal was assessed several times with repeated cystometry and biopsy. A total of 45 biopsies were performed in the group using the expander and 42 in the control group.

We histologically demonstrated the growth of urinary epithelium in the de-epithelialized graft in all studied samples.

The performance of cystographies and excretory urographies was also important in order to better documenting and comparing the morphology of confectioned neobladders.

We concluded that the use of the intravesical silicone modeler prevented retraction of the neobladder of de-epithelialized ileum.

Prof. Romero Glasner drew the illustrations contained in this work, and Silimed, Rio de Janeiro, supplied the vesical modelers.

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UROLOGICAL SURVEY

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STONE DISEASE

Association of urinary pH with body weight in nephrolithiasis

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Kidney Int. 2004; 65: 1422-5

Background: The prevalence of kidney stone disease in the United States is progressively increasing, paralleling the growing rate of obesity. Uric acid nephrolithiasis, a condition associated with a low urinary pH, has been linked to obesity and insulin resistance. Based on these observations, we hypothesized that urinary pH may be inversely associated to body weight in nephrolithiasis.

Methods: Data were retrieved from 4883 patients with nephrolithiasis who underwent ambulatory evaluation at two established stone clinics in Dallas and Chicago. The patients collected 24-hour urine samples on an outpatient basis, while avoiding any drug that could alter urinary pH. Patients were divided in increasing sextiles of body weight, and urinary pH was adjusted for urinary creatinine and for age.

Results: Urinary pH had a strong, graded inverse association with body weight. Urinary creatinine and age were both found to be significant covariates of urinary pH, while gender was not a significant independent variable after adjustment for urinary creatinine. Mean 24-hour urinary pH, adjusted for age and urinary creatinine, were 6.09, 6.04, 6.01, 5.99, 5.97, and 5.91 for sextiles of body weight in increasing order from Dallas (P for linear trend < 0.0001), and 6.18, 6.10, 6.04, 6.02, 5.97, and 5.88 for the sextiles from Chicago (P for linear trend < 0.0001).

Conclusion: We conclude that urinary pH is inversely related to body weight among patients with stones. The results confirm the previously proposed scheme that obesity may sometimes cause uric acid nephrolithiasis by producing excessively acid urine due to insulin resistance.

Editorial Comment

For those of us who treat a lot of stones and have a large referral practice for obese stone-forming patients, the observation that many of these patients have uric acid stones is no surprise. On the surface many of us have assumed that the high incidence of uric acid stone disease was due to overindulgence in salt, meat and dairy leading to low urine pH and high urinary uric acid. However, the group from Dallas has postulated a novel pathophysiologic mechanism for uric acid stone formation (1). By their theory, the acidic urine seen in obese uric acid stone formers is attributed to insulin resistance in the kidney, which leads to decreased renal ammonia excretion and subsequent reduced urinary buffering capacity, thereby causing an acidic urine.

In the current study, patient databases from 2 of the largest metabolic stone clinics in the country were searched to establish the relationship between urine pH and body weight in a large group of stone patients. A strong, inverse association was found between urine pH and body weight, a relationship which held even after adjustment for a variety of potential confounding factors. Interestingly, after adjustment for urinary sulfate, a marker for animal protein intake, the strong inverse association persisted, suggesting that the mechanism is independent of diet and not simply a result of dietary indiscretion. Indeed in their seminal work, the investigators confirmed low urine pH in obese uric acid stone patients maintained on a controlled metabolic diet.

These findings support the insulin resistance-mediated mechanism of increased urinary acidity in obese patients. Therefore, it is hoped that with weight loss (and dietary modification), insulin-resistance may be reversible and urinary acidity can be returned to normal, thereby reducing the risk of stone formation.

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Safety and efficacy of percutaneous nephrolithotomy in patients with neurogenic bladder dysfunction

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Urology. 2004; 63: 636-40

Objectives: To review our experience performing percutaneous nephrolithotomy (PNL) on patients with neurogenic bladder dysfunction with special attention paid to the risks of surgical complications and stone recurrence. Patients with neurogenic bladder dysfunction with or without urinary diversion are at increased risk of urolithiasis, surgical complications, and recurrent stone disease.

Methods: We retrospectively reviewed the 23 patients with neurogenic bladder dysfunction who underwent PNL at our institution. Neurologic lesions included spina bifida, traumatic spinal cord injury, exstrophy/epispadias, neonatal meningitis, stroke, and spine chondrosarcoma. Bladder management included ileal conduit (n = 8), intermittent catheterization (n = 7), indwelling catheter (n = 7), and ureterosigmoidostomy (n = 1).

Results: We performed 100 procedures on 47 renal units (17 bilateral, 7 with recurrent stones). Urinary tract infection/colonization was seen in 21 of 23 patients, most of whom had more than one organism. The stone-free rate was 96%. Six patients required three or more procedures, each had a complete staghorn calculus. In an average of 36 months of follow-up, 10 patients (46%) had recurrent stone disease requiring intervention, and 5 patients (23%) underwent repeat PNL. The stone composition analysis revealed mainly infection-related stones.

Conclusions: PNL in patients with neurogenic voiding dysfunction is safe and effective, with outcomes comparable to that of patients without such lesions. The complication rate is small but statistically significant. It is important to obtain adequate urine cultures, because renal pelvis and bladder culture data may differ and affect the outcome. Risk factors for recurrent stone disease include a high spinal cord lesion, indwelling urinary catheter, and ureterosigmoidostomy.

Editorial Comment

Patients with neurogenic bladders with or without urinary diversion have a high incidence of chronic urinary tract infections and stones. Results with shock wave lithotripsy have been disappointing with regard to stone free rates and recurrent stone disease. As such, many of these patients are best managed with percutaneous nephrostolithotomy (PCNL). Unfortunately, infectious and other complications are common in this patient population.

Nadler and colleagues reviewed their series of 23 patients with neurogenic bladder dysfunction who underwent 100 PCNL procedures on 47 renal units to assess success and complication rates. With aggressive second look flexible nephroscopy in all but 2 patients, an impressive stone free rate of 96% was achieved. Moreover, despite documented urinary tract infection in 91% of patients, only one case of urosepsis occurred,

after initial percutaneous access. The authors attribute their low infectious complication rate to pre-operative treatment of positive urine cultures, percutaneous access and collecting system drainage the day prior to PCNL and aggressive culture-specific intravenous antibiotics after drainage. However, despite their high stone free rate, recurrent stones occurred in 46% of patients within 36 months.

This study highlights the potential complications of treating stones in this patient population as well as the high rate of recurrence despite a stone free state. However, it is encouraging that with careful pre- and intra-operative measures, complication rates can be minimized. While the practice of routinely obtaining percutaneous access a day or more prior to the procedure has never been shown in controlled trials to reduce infectious complications, and I personally have not adopted this practice, it does allow renal pelvic urine to be assessed prior to initiating lengthy manipulation of the urinary tract. In addition, although the authors advocate oral antibiotics for 2 days prior to admission, I favor a more prolonged course of 1-2 weeks of culture specific antibiotics to assure at least superficial sterilization of the urinary tract.

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ENDOUROLOGY & LAPAROSCOPY

Use of a ureteral access sheath to facilitate removal of large stone burden during extracorporeal shock wave lithotripsy

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Urology 2004; 63: 574-576.

Large renal stone burdens within a nondilated collecting system in patients with a relative contraindication to percutaneous nephrolithotomy can be a challenging problem. We describe a novel technique using a ureteral access sheath combined with extracorporeal shock wave lithotripsy to facilitate passage of stone fragments in such patients.

Editorial Comment

A ureteral access sheath is a hollow sheath that is placed with an obturator over a wire into the ureter. After removing the obturator, the sheath allows rapid placement and removal of ureteroscopes and improves irrigant outflow. The internal diameter of the devices ranges from 9.5 to 16 F, with lengths from 20 to 55 cm. Although ureteral access sheaths have been available for many years, they did not become popular until some modifications by Applied Medical (Rancho Santa Margarita, CA, USA) made them easier to insert and more rigid. Further modifications by Applied and then others - there are now sheaths available from at least 3 other companies - have included additional kink resistance, hydrophilic coatings, extra channels for guidewires, and improved obturators. Many endourology experts have advocated their routine use in all flexible ureteroscopic procedures, to ease ureteroscope passage, minimize pressure in the upper tract, and facilitate rapid removal and re-insertion of the ureteroscope for fragment or biopsy retrieval. Others use them only for specific indications. I consider them to be most useful when there is a good reason to remove stone fragments rather than simply

fragmenting the stone ureteroscopically and depending on spontaneous fragment passage. This typically is the case when renal drainage is poor (i.e., very dependent and dilated lower pole) and even small fragments are unlikely to pass, or if the stone burden is very large and the sheer volume of fragments might be problematic. Okeke and associates found a novel use for a ureteral access sheath in the setting of large stone burden, in that they positioned the end sheath just inside the ureteropelvic junction to facilitate active irrigation of fragments during shock wave lithotripsy, with the end result being that many of the fragments washed out of the kidney during the procedure. Given the large stone burden, the stone free result in the patient were excellent. The operative time is not provided, although I imagine that the procedure was fairly tedious. I have used a similar technique during ureteroscopic treatment of large renal stones, in patients whom, for one reason or another, were not candidates for percutaneous stone extraction. In cases where active clearance of fragments is desired, a ureteral access sheath is a useful adjunct in endourological management.

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Long-term results of laparoscopic retroperitoneal lymph node dissection: a single-center 10-year experience

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Urology 2004; 63: 550-5

Objectives: To evaluate the feasibility, morbidity, and long-term oncologic efficacy of laparoscopic retroperitoneal lymph node dissection (L-RPLND) in patients with nonseminomatous germ cell tumor (NSGCT).

Methods: L-RPLND was performed 188 times in 185 patients; 114 procedures were performed for Stage I NSGCT and 6 procedures for tumor marker-negative clinical Stage IIA disease. In the case of positive lymph nodes, adjuvant cisplatin-based chemotherapy was administered. After chemotherapy, L-RPLND was performed for retroperitoneal Stage IIA (10 patients), IIB (43 patients), and IIC lesions (15 patients).

Results: The mean operative time was 256 minutes for Stage I and 243 minutes for Stage II; the conversion rate was 2.6%. The mean blood loss was 159 mL in patients with Stage I and 78 mL in those with Stage II disease. Active tumor was found in 19.5% of patients with Stage I lesions and in 50% of patients with tumor marker-negative clinical Stage IIA disease. After chemotherapy, active tumor was found in 1 patient with Stage IIC disease and mature teratoma in 38.2% of patients. The mean postoperative hospital stay for those with Stage I and II disease was 4.1 and 3.7 days, respectively. Antegrade ejaculation was preserved in 98.4% of patients. The mean follow-up was 53.7 months for those with Stage I and 57.6 months for those with Stage II disease. All but 6 patients have remained free of relapse, and no patient died of tumor progression.

Conclusions: The rate of tumor control after L-RPLND and the diagnostic accuracy of L-RPLND were equal to the open procedure, and the morbidity was significantly lower. Therefore, L-RPLND for Stage I and low-volume retroperitoneal Stage II disease can be performed at centers with experience in urologic laparoscopy and oncology.

Editorial Comment

With the recent explosion of interest in laparoscopic prostatectomy and laparoscopic partial nephrectomy, with virtually every paper stating that these procedures should be performed only by those with “advanced

laparoscopic experience,” the challenge of laparoscopic retroperitoneal lymph node dissection (L-RPLND) is often overlooked. I agree with the authors that a left-sided L-RPLND for Stage I nonseminomatous germ cell tumor (NSGCT) is the best way to start off. The left-sided template is smaller, the aorta is more forgiving, and the midline does not need to be crossed. There is controversy about the right-sided template, however. For those who feel that the right-sided dissection should be carried all the way to the contralateral renal hilum, completing this dissection laparoscopically without repositioning is difficult. It would have been nice if the authors had given us data on operative time, complications, and conversions for right vs. left procedures - I would guess that the right-sided ones were more challenging and dangerous. Disagreements about extent of the template aside, the authors’ data are very reassuring as to the completeness of the dissection for Stage I disease. Of 91 patients with negative dissections, only one suffered a retroperitoneal recurrence. This suggests that the dissection by the authors is thorough. Certainly, their data regarding complications and conversions are excellent. L-RPLND should be considered an excellent option when there is “advanced laparoscopic experience.”

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IMAGING

Adrenal neoplasms: CT-guided radiofrequency ablation - preliminary results

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Radiology 2004; 231: 225-30.

Purpose: To evaluate initial experience with radiofrequency (RF) ablation of adrenal neoplasms.

Materials and Methods: Thirteen adrenal masses in 12 patients (bilateral metastases in one patient) were treated with computed tomography (CT)-guided percutaneous RF ablation. Eleven adrenal lesions were metastases (five from lung cancer, four from renal cell carcinoma, and two from melanoma); one lesion was a pheochromocytoma and one was an aldosteronoma. There were 10 men and two women (average age, 58 years; range, 40-77 years) in the study; average adrenal mass diameter was 3.9 cm (range, 1-8 cm). Average number of RF applications per adrenal mass was 2.7 (range, 1-5 applications); average time per application was 7.8 minutes (range, 4-13 minutes). An internally cooled single electrode was used in five sessions; an internally cooled cluster electrode was used in eight sessions.

Results: Average follow-up was 11.2 months (range, 1-46 months). Eleven of 13 lesions were treated successfully with RF ablation after one session. Successful treatment was defined as lack of enhancement of the treated region on follow-up CT images and resolution of the biochemical abnormality in two patients. In two patients with large adrenal lesions (4 and 8 cm in diameter), enhancement of residual tissue was observed after one treatment session; this finding was indicative of residual tumor. One patient with thrombocytopenia that resulted from chemotherapy had a small hematoma, but no transfusion was required. No patient developed hypertension during the RF application. No patient with metastases had recurrent tumor at the treated site, and this lack of recurrence indicated effective local control; 11 patients had progression of metastatic disease at extraadrenal sites.

Conclusion: Preliminary data suggest that CT-guided RF ablation is an effective technique for local control of adrenal neoplasms.

Editorial Comment

Radiofrequency (RF) thermal ablation is a minimally invasive technique for treating inoperable solid tumors. This technique has been mainly used to treat solid hepatic and renal tumors and bone lesions (particularly osteoid osteoma). More recently, lesions involving lung, breast and the adrenal gland have also been treated by this modality. Percutaneous, image-guided RF ablation is a safe and well-tolerated procedure but may eventually present variable degree of complication (bleeding, infection, tumor seeding, pneumothorax and non-targeted thermal damage).

In this paper the authors present a successful treatment of 11 of thirteen adrenal tumors (average diameter of 3.9 cm) treated with a CT-guided RF ablation. Eleven out 13 adrenal masses were metastases, with 6 isolated to the adrenal gland and 5 associated with localized disease elsewhere that had been successfully controlled with chemotherapy, radiation therapy, and/or surgical resection. Criteria for successful treatment were based on the absence of residual CT-contrast enhancement of soft tissues component, no evidence of subsequent adrenal enlargement or recurrent biochemical activity. Six of the ten patients with an extraadrenal primary tumor subsequently died of metastatic disease to other sites. The average time of death was 8 months after the adrenal tumor treatment (range 3 - 16 months). The four remaining patients of the 10 with extraadrenal primary tumor had new metastatic disease in extraadrenal sites. This manuscript offers a promising technique with important results since no patient with metastases (11 patients) had recurrent tumor at the treated site, and this lack of recurrence indicated effective local control.

Although consensus indication of percutaneous RF ablation in oncology is not strictly defined, one should keep in mind that the use of these techniques for local cancer treatment should consider that a local disease control may or may not improve patients' survival. Long term follow-up and randomized prospective trials are required to evaluate survival impact, document long-term efficacy and to determine if percutaneous RF ablation can reduce the number or eliminate repeated surgical intervention in specific clinic scenarios.

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Arteriuoreteral fistulas: a clinical, diagnostic, and therapeutic dilemma

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AJR Am J Roentgenol. 2004; 182: 1241-50

Review article: no abstract available

Editorial Comment

Arteriuoreteral fistula is a rare entity and a potentially life-threatening cause of hematuria with a 23% mortality rate. Although rare, it is being diagnosed more frequently because of the increase of predisposing factors such as radiation therapy and major surgery in the pelvis, presence of previous vascular surgery and presence of double-J-stent (1,2). These patients usually present intermittent episodes of gross hematuria. Arteriuoreteral fis-

tula represents abnormal communications between a major artery and the mid or distal portion of the ureter. Frequently the fistula occurs between the external iliac artery and the ureter. This entity is a diagnostic challenge for the radiologist given the intermittent nature of the bleeding. Thus, various techniques have been used in attempt for its diagnosis: cystoscopy, intravenous urography, ureterography, abdominal and pelvic CT, renal arteriography, and selective iliac arteriography. Selective iliac arteriography although presents low sensitivity (less than 50%), is considered the most sensitive technique. The cause of false negative examination is due to the fact of examining the patient when the fistula is partially occluded by a thrombus (quiescent phase). True positive findings are arterial pseudoaneurysms at the point where the ureter crosses the iliac artery and gross extravasation of contrast material into the ureter. Classic treatment of this entity is based on open surgery, which is usually unsuccessful and frequently associated with increased morbidity and mortality. In patients explored surgically without a preoperative diagnosis, the mortality rate is 64% in comparison to 8%, when the correct diagnosis is made pre-operatively.

Option treatments are quite variable: nephrectomy or nephroureterectomy, ureteral reconstruction, ureterostomy (surgical or percutaneous) or pyelonephrostomy, ligation of the ureter, embolization of the renal artery, renal irradiation, and autotransplantation. Recently a sonographically guided percutaneous nephrostomy followed by antegrade insertion of multiple metallic coils into the ureteral lumen just proximal to the fistula was reported. Vascular surgical procedures includes local reconstruction (i.e., arteriorrhaphy, patch closure, interposition graft, bypass), ligation with or without extra anatomic bypass (if arterioureteral fistulas arise from either common or external iliac artery), and ligation of the internal iliac artery.

Recently successful endovascular treatment of arterioureteral fistula using graft covered stent have been described and it seems to be a promising alternative to surgical procedures because presents less morbidity and mortality. Long-term follow-up after this endovascular treatment technique is needed.

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UROGENITAL TRAUMA

Management of bulbous urethral disruption by blunt external trauma: the sooner, the better?

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Urology 2002; 60: 579-83.

Objectives: To investigate whether the incidence of urethral stricture is different according to the primary mode of management, we retrospectively reviewed the record of patients with bulbous urethral disruption by external blunt trauma.

Methods: A total of 95 patients with blunt bulbous urethral injuries were included in the study. Sixty-five underwent immediate urethral realignment and 30 underwent initial suprapubic tube placement followed

by delayed management. The urethral injuries were interpreted as partial or complete disruption on the basis of the retrograde urethrographic findings.

Results: Urethral stricture developed in 12 patients (18.5%) who underwent immediate management and in 12 patients (40.0%) who underwent delayed management ($P = 0.025$). Of the patients with partial disruption, no significant difference was found in the urethral stricture incidence between the two groups. However, of the patients with complete disruption, urethral stricture developed in 10 (31.3%) of 32 patients who underwent immediate management and 11 (68.8%) of 16 patients who underwent delayed management ($P = 0.014$). In addition, the degree of urethral stricture in the patients who underwent delayed management was more severe than in those who underwent immediate urethral realignment ($P = 0.023$).

Conclusions: Our findings suggest that better outcomes can be obtained when immediate urethral realignment is successful in patients with bulbous urethral disruption. Additional research, including prospective randomized trials, is needed to confirm these findings.

Editorial Comment

This is only one of many studies that shows that early endoscopic realignment of blunt posterior urethral injuries is a good idea. In this series, the rate of stricture formation was halved in those who were realigned. Other series show similar benefit.

Techniques: Many techniques have been described. I first attempt to place a flexible cystoscope in the bladder - this is successful in a small but notable percentage. Next I dilate the suprapubic tract with flexible urethral dilators, place the flexible cystoscope into the bladder over a wire, and attempt antegrade passage of the scope. Placement of the guidewire down through the proximal urethral stump is often successful, and a Council catheter can then be "railroaded" into the bladder from below. If this fails, I have a second surgeon perform rigid urethroscopy from below, turn off the light on the antegrade scope, and attempt to advance the flexible scope from above towards the light. If this fails, I stop and try again another day.

Timing: Timing of attempted realignment can be difficult. Unstable or very ill patients may need to be temporized with a suprapubic tube, and brought to the operating room only when more stable, or undergoing other procedures. Some series show that even delayed realignment up to 20 days after injury is helpful. If the first attempt at realignment fails, I suggest bringing the patient back 2 or 3 days later and trying again. I limit my attempts to about 45 minutes, reasoning that continued attempts might be harmful, although no data exists to prove this.

Complications vs Benefits: Some practitioners worry that endoscopic realignment might have some sort of unexpected complication, such as infection of the hematoma, or pelvic damage from the use of irrigation during cystoscopy. This has not ever been reported, and certainly these theoretical complications are outweighed by the real benefits from the procedure. Benefits include the possibility that the urethra will heal, even when completely disrupted, without the need for secondary delayed urethroplasty. When urethroplasty is required, it is clear that the procedure is much easier after endoscopic realignment because the scar defect between the normal urethral ends is shorter and the ends are often in reasonable apposition.

Do not attempt early open realignment: We must always emphasize that the data shows that immediate open realignment is not a good idea. It increases the incontinence rate, the impotence rate, and can be associated with life threatening bleeding when the pelvic hematoma is entered. Even in cases of rectal injury, where laparotomy, rectal closure and colostomy may be required, placement of a urethral catheter across the defect without primary suturing may be most prudent.

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Renal injury and operative management in the United States: results of a population-based study.

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J Trauma. 2003; 54:423-30

Background: To evaluate the extent to which nonoperative renal trauma management has been adopted, we determined the incidence of renal injury and the rate of operative management across the United States.

Methods: International Classification of Diseases, Ninth Revision diagnosis and procedure codes identified patients with renal injuries in an 18-state administrative database representing 62% of the U.S. population.

Results: Of 523,870 patients hospitalized for trauma in 1997 or 1998, 6,231 (1.2%) had renal injuries (4.89 per 100,000 population). Sixty-four percent of patients with injuries that were classified had contusions/hematomas, 26.3% had lacerations, 5.3% had parenchymal disruption, and 4% had vascular injuries. Eleven percent of renal trauma patients required surgical management of their kidney injuries, of whom 61%, or 7% of patients with renal injuries overall, underwent nephrectomy. Injury Severity Score, mechanism, and renal injury severity were independent predictors of nephrectomy.

Conclusion: The nephrectomy rate in community and academic centers reflects renal and global injury severity. Prospective trials are indicated to determine whether, in the traumatized patient with severe kidney injury, renal preservation could lead to improved outcomes compared with nephrectomy.

Editorial Comment

The most quoted statistic is that 10% of all serious injuries involve the kidney. However, in this review of half a million American trauma patients, the real incidence was closer to 1%. Subset analysis showed different renal injury rates depending on the cause of trauma: firearms 3.5%, motor vehicle accidents 2.2%, bicycle accidents 1.9%, pedestrian accidents 1.5%, stab wound 0.8% and falls 0.5%. Most injuries were renal contusions (64%) although 26% had lacerations, 5% had parenchymal disruption and 4% had vascular injuries. 13% of lacerations were treated with renorrhaphy, and 10% with nephrectomy, while 25% of vascular injuries required nephrectomy.

Patients with vascular injuries, when operated on, had an 84% nephrectomy rate - which seems understandable in light of the potential for exsanguination or renal nonfunction after these injuries. Of those being operated on for lacerations, the nephrectomy rate as an appallingly high 64%.

There are lessons from this huge series:

- 1) Renal injury rates are lower than we thought
- 2) Vascular injuries, when operated on, usually result in nephrectomy
- 3) Renal lacerations (too) frequently result in nephrectomy when operated on. Because of this, I believe that expectant management is the preferred approach, as surely some of these 64% lost kidney might be saved either by more judicious use of renorrhaphy or by avoiding retroperitoneal exploration altogether.

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PATHOLOGY

A clinicopathologic comparison of clinical stages T1c versus T2 prostate adenocarcinoma: lack of differences in PSA recurrence

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Mod Pathol. 2004; 17 (suppl.1): 138A

Background: The current staging system places men with tumors detected because of elevated prostate-specific antigen in the T1 group and those with palpable localized prostate cancer in T2. To test the hypothesis that these patients have similar outcomes and other clinicopathologic features and should be grouped together, we studied a series of 291 patients with cT1c and cT2 prostate cancers.

Design: From a series of 288 consecutive patients who underwent radical retropubic prostatectomy, we studied those with cT1c (n = 223) and cT2 (n = 65) adenocarcinoma. All specimens were totally embedded and whole-mounted. Tumor volume was measured using the grid method. Clinical and pathologic characteristics were analyzed.

Results: Patients with cT2 tumors were more likely to have a higher Gleason score (P = 0.04) and final pathologic stage (P = 0.05), compared to those with T1c tumors. There was no significant difference in age (P = 0.92), preoperative PSA (P = 0.17), prostate weight (P = 0.34), tumor volume (P = 0.16), the largest tumor size (P = 0.12), surgical margin status (P = 0.86) or the presence of perineural invasion (P = 0.09) between patients with clinical stage T1c tumors and those with cT2 tumors. No difference in PSA recurrence was observed between patients with clinical stage T1c tumors and those with cT2 tumors (P = 0.20).

Conclusions: Patients with clinical stage T2 tumors have higher Gleason score and final pathologic stage compared to those tumors detected because of elevated serum PSA (T1c). However, the PSA recurrence rate for T1c tumors is similar to cT2 tumors, indicating a need for further refinement of clinical staging system.

Editorial Comment

Tumor found in one or both lobes by needle biopsy, but not palpable or visible by imaging, is classified as T1c. This is a clinical category in the TNM system corresponding to several pathologic findings in the specimen of radical prostatectomy. The study showed that clinical stage T2 tumors have higher Gleason score and final pathologic stage compared to those tumors detected because of elevated serum PSA (T1c), however and most importantly, the PSA recurrence rate for T1c tumors is similar to clinical T2 tumors. The TNM system stratifies prostate carcinoma according to prognosis as evaluated by biochemical recurrence and/or metastases. Based on their findings the authors suggest a further refinement of clinical staging system probably including T1c in the T2 category.

Recently we classified in our Institution 51 stage T1c patients and 104 clinical T2 patients according to the pathologic findings of the radical prostatectomy specimen. The findings were classified as corresponding to minimal, moderate or advanced tumor according to the study published by Epstein et al. (JAMA. 1994; 271: 368-374). The distribution for stage T1c was 19.69%, 60.78% and 19.69% surgical specimens in the categories limited tumor, moderate tumor and advanced tumor respectively; and, for clinical stage T2, 9.61%, 62.5% and 27.9% respectively for the same categories. The statistical analysis did not show significant difference between these two stages (p = 0.165). Our findings also favor a further refinement of clinical staging system.

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Does pT2b cancer exist? Critical appraisal of the 2002 Tumor-Nodes-Metastasis (TNM) classification of prostate cancer

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Mod Pathol. 2004; 17 (suppl. 1): 148A

Background: Clinical and pathologic staging of prostate adenocarcinoma provides a method for assessing the extent of tumor and predicting patient prognosis. The American Joint Committee on Cancer (AJCC) TNM staging system has undergone recent revisions for stage T2 prostate tumors. T2 tumors are now subclassified as T2a (less than one half of one lobe involvement), T2b (more than one half of one lobe involvement), and T2c (bilateral involvement). Despite general acceptance of the system as a whole, controversy and uncertainty still exist in the application of the TNM staging system, particularly with use of the T2 staging subclassification. We analyzed the 2002 AJCC subclassification for stage T2 prostate cancers in a large series of radical retropubic prostatectomies.

Design: The study population consisted of 369 prostate cancer patients treated by radical retropubic prostatectomy. None were treated by hormonal or radiation therapy prior to surgery. Radical prostatectomies were histologically evaluated by complete embedding and whole mount processing. Tumors were initially staged using the 1997 AJCC TNM system, and then reevaluated according to 2002 TNM staging guidelines.

Results: The prostate weight ranged from 14 to 149 grams (median, 38 grams). Prostate cancers were multifocal in 312 cases (85%). The majority of the specimens were pathologic stage T2 (276, 75%). Using the 2002 TNM staging criteria, 54 (15%) of the tumors were stage pT2a, 222 (60%) were pT2c, 75 were (20%) pT3a, and 18 (5%) were pT3b. No pathologic stage T2b tumors were identified.

Conclusions: Taking into consideration the average prostate weight (35 grams) as well as the predominance of tumor multifocality, it would be unusual to identify tumor involving more than one half of one lobe (approximately 8 cc), without involving the other lobe. We question the existence of a true pT2b tumor.

Editorial Comment

This is a very interesting study based on pathologic findings in the specimen of radical prostatectomies questioning the existence of pT2b tumors. None of a total of 369 cancers was stage pT2b. No case involved more than half of one lobe when cancer is unilateral.

We were very curious about and checked this finding in 198 radical prostatectomies performed in our Institution. From the total of 198 specimens, cancer was bilateral in 174 (87.87%) and unilateral in 24 (12.12%). We use for tumor extent evaluation a point-count method published by us in *International Braz J Urol.* 2003; 29:113-120. In all of the 24 specimens with unilateral cancer, extension corresponded to less than half of the lobe. Our findings also question the existence of a true pT2b tumor.

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INVESTIGATIVE UROLOGY

Enhanced renal cryoablation with hilar clamping and intrarenal cooling in a porcine model

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Urology 2004; 63: 1209-1212.

Objectives: To evaluate the effects of renal vascular control and intrarenal cooling on the size of renal lesions attainable with a 3.4-mm cryoprobe.

Methods: Three groups of pigs underwent unilateral laparoscopic renal cryoablation with a 3.4-mm cryoprobe inserted to a depth of 1 cm. An 8-minute double-freeze cycle was used. One week later, an acute contralateral cryolesion was created before killing the animal. In group 1 (n = 6), bilateral cryolesions were created without hilar clamping or intrarenal cooling. In group 2 (n = 6), the cryolesions were created after hilar clamping alone. In group 3 (n = 6), the cryolesions were created after both hilar clamping and application of intrarenal cooling with saline ice-slush infused into the renal pelvis. After nephrectomy, the gross diameters were determined for each cryolesion. The mean diameters of the zones of complete and partial necrosis were determined by histopathologic examination.

Results: In group 3, the cortex cooled from 36.9°C to a mean of 24.8°C. Acutely, no statistically significant difference was found between the lesions produced with clamping alone (37.6 mm) and intrarenal cooling (40.4 mm); however, both were significantly larger than the control cryolesions (28.7 mm). At 1 week, the area of complete necrosis produced with intrarenal cooling (34.3 mm) was significantly larger than the areas of necrosis produced by clamping alone (27.8 mm) or conventional cryoablation (23.9 mm; ALPHA = 0.05, Tukey's honestly significantly different [HSD] test).

Conclusions: Enhanced cryolesion necrosis was achieved with intrarenal cooling with a 3.4-mm cryoprobe. Intrarenal cooling may be a valuable adjunct to cryoablation in selected cases.

Editorial Comment

The authors evaluated the ability of intrarenal cooling (retrograde intracavitary ice-cold saline perfusion) and hilar clamping to increase the area of renal necrosis attainable with a single cryoprobe.

The authors noted a significantly increased gross cryolesion diameter with occlusion of both renal artery and vein. Additionally, it was observed that the mean diameter of complete central necrosis was 4 mm larger with hilar occlusion alone than it was with conventional cryoablation. Intrarenal cooling with hilar clamping produced necrotic cryolesions that were an average of 10 mm larger than standard cryolesions and 6 mm larger than cryolesions with hilar occlusion alone.

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Improvement in relaxation response in corpus cavernosum from trained rats

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Urology 2004; 63: 1004-1008.

Objectives: To evaluate the contractile and relaxing responses in rat corpus cavernosum (RCC) from rats after 8 weeks of run training, because erectile function is highly dependent on nitric oxide (NO) from nitrergic fibers or endothelium. Physical activity enhances NO production and improves endothelial function, with beneficial effects on cardiovascular disease.

Methods: The training program consisted of 8 weeks of run training, 5 days/wk, and each session lasted 60 minutes. The RCC was isolated, and concentration-response curves to NO, acetylcholine, sodium nitroprusside, phenylephrine, and endothelin were obtained. The excitatory and inhibitory effects of electrical field stimulation (2 to 32 Hz) were also evaluated.

Results: NO (0.1 to 100 μ M) and sodium nitroprusside (0.01 to 1000 μ M) produced a relaxing effect in RCC in a dose-dependent manner, with the maximal responses to NO (control $62\% \pm 4\%$, trained $88\% \pm 3\%$) and sodium nitroprusside (control $83\% \pm 3\%$, trained $95\% \pm 2\%$) significantly enhanced after 8 weeks of run training. However, acetylcholine-induced relaxations were not affected by exercise. Similarly, electrical field stimulation-induced relaxations were significantly increased in RCC from trained rats at 2 Hz (control $2.4\% \pm 0.3\%$, trained $4.2\% \pm 0.5\%$) and 4 Hz (control $5.3\% \pm 1.2\%$, trained $12.5\% \pm 1.7\%$). The contractile sensitivity of RCC to phenylephrine (0.01 to 100 μ M) and endothelin (0.01 to 100 nM) was not modified by training exercise.

Conclusions: Our findings suggest that run training enhances functional responses in rat RCC that involves increases in the NO-cyclic guanosine monophosphate signaling pathway by endothelium-independent mechanisms that is not accompanied by changes in contractile sensitivity.

Editorial Comment

Previous studies have associated the beneficial effect of regular physical activity on cardiovascular diseases, with improvement in endothelium-derived relaxing factor production, reduction of sympathetic drive, and increases in parasympathetic activity to the peripheral tissues.

The authors perform the present experience aiming to evaluate the functional responses to both vasodilating agents (sodium nitroprusside [SNP], acetylcholine [ACh], NO) and vasoconstricting agents (phenylephrine [PE] and endothelin-1 [ET-1]) in rat corpus cavernosum (RCC) after 8 weeks of treadmill training.

The authors demonstrated objectively by the first time that physical training has beneficial effects on functional responses of RCC, because the run training program for 8 weeks increased the relaxation response to NO, SNP, and EFS.

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RECONSTRUCTIVE UROLOGY

Neuroanatomy of the male urethra and perineum

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BJU Int. 2003; 92: 624-30

Objective: To describe the topography of the perineal nerves from their pudendal origin to their course into the male genitalia, with specific attention on the course of the perineal nerve along the ventral penis, including branches into bulbospongiosus muscle and corpus spongiosum.

Materials and Methods: The study comprised 18 normal human fetal penile specimens at 17.5 - 38 weeks of gestation (determined by fetal heel-to-toe length). Specimens were fixed in formalin, embedded in paraffin wax and serially sectioned at 6 micro m. The penile specimens contained the whole penis from the glans to the crural bodies, beneath the pubic arch and the perineum up to the anal verge. Immunocytochemistry was assessed on selected sections with antibodies against the neuronal markers S-100 and nitric oxide synthase (nNOS). Three-dimensional computer reconstruction of serial sections allowed an in-depth analysis of the neuroanatomy of the fetal penis, perineum and surrounding structures.

Results: After the pudendal nerve leaves the pudendal canal it gives rise to the perineal nerve branches in the ischiorectal fossa. Perineal nerves travel alongside the ischiocavernosus and bulbospongiosus muscles and before reaching the latter, nerve branches course into the bulbospongiosus muscle. During its pathway within this muscle, fine nerve fibres course into the corpus spongiosum by piercing through the junction of the muscle. At the penoscrotal area, the perineal nerves give branches to the scrotum, funnelling into the interscrotal septum. Perineal nerves continue their pathway over the ventral side of penis covering the ventral surface of corpus spongiosum. Branches of the dorsal nerve of the penis at the junction of corpus cavernosum and corpus spongiosum assemble into a network with the perineal nerves. All perineal nerves from their main trunk at the ischiorectal fossa until their interaction with dorsal nerve of penis at the base of penis were nNOS negative. After the interaction with the dorsal nerve of penis, they become nNOS positive.

Conclusion: Integrating neuroanatomical knowledge about the perineal nerves and their communication with the dorsal nerve of penis should facilitate a strategic approach to reconstructive procedures on the penis. Special care should be taken at the junction between the corpora cavernosa and spongiosa, where the dorsal nerve joins the perineal nerve, and at the proximal bulbospongiosus muscle, thereby protecting the fine nerves piercing into the cavernosa spongiosa.

Editorial Comment

The authors in this paper describe nicely the topography of the pudendal branches supplying the external male genitalia. Although the anatomy of the pudendal nerves have been the subject of reports for almost 2 centuries newly developed surgical techniques and diagnostic procedures as well as findings regarding the pathophysiology of diseases of the external male genitalia and external sphincter have led to new studies looking at the topography of nerve ramifications such as the pudendal nerve and its interaction with the vegetative neural system. Recent papers have specifically looked at the role of pudendal nerve branches both in the male and female external sphincter (1,2). In this manuscript the authors nicely outlined how the perineal branches of the pudendal nerve travel alongside the musculus ischiocavernosus and bulbospongiosus before penetrating the corpus spongiosum. There is also an apparent strong communication between the perineal pudendal nerve branches and the dorsal nerve of the penis at the junction of the corpus cavernosum and the corpus spongiosum.

These findings are not only important for elucidation of penile diseases or application of local anaesthesia in case of penile surgery, it may also be relevant for the discussion whether afferent sensory nerves from the membranous urethra and the proximal bulbous urethra go alongside the same pathways. According to recent literature (3) sensory afferent nerves from these urethral segments are probably mainly responsible for prevention of the “first drop” incontinence after radical prostatectomy or cystectomy.

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Urinary tract biomaterials

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J Urol. 2004; 171: 2438-2444

Purpose: As a result of endourological advances, biomaterials have become increasingly used within the urinary tract. This review article provides an update on the current status of urinary tract biomaterials, discussing issues of biocompatibility, biomaterials available for use, clinical applications and biomaterial related complications. Perspectives on future materials for use in the urinary tract are also provided.

Materials and Methods: We performed a comprehensive search of the peer reviewed literature on all aspects of biomaterials in the urinary tract using PubMed and MEDLINE. All pertinent articles were reviewed in detail.

Results: Any potential biomaterial must undergo rigorous physical and biocompatibility testing prior to its commercialization and use in humans. There are currently many different bulk materials and coatings available for the manufacturing of biomaterials, although the ideal material has yet to be discovered. For use in the urinary tract, biomaterials may be formed into devices, including ureteral and urethral stents, urethral catheters and percutaneous nephrostomy tubes. Despite significant advances in basic science research involving biocompatibility issues and biofilm formation, infection and encrustation remain associated with the use of biomaterials in the urinary tract and, therefore, limit their long-term indwelling time.

Conclusions: Prosthetic devices formed from biomaterials will continue to be an essential tool in the practicing urologist's armamentarium. Ongoing research is essential to optimize biocompatibility and decrease biomaterial related complications such as infection and encrustation within the urinary tract. Future advances include biodegradables, novel coatings and tissue engineering.

Editorial Comment

This is a nice overview of the increasing number of biomaterials which can be used for and around the urinary tract. However, ongoing research is an absolute must because biocompatibility, interactions with body tissues and subsequent scarring are far from ideal with the current materials.

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UROLOGICAL ONCOLOGY

Tumor seeding in urological laparoscopy: an international survey

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J Urol. 2004; 171: 2151-4

Purpose: During the last 10 years laparoscopy has been applied to treat most urological pathology including malignancies. There has been concern regarding peritoneal dissemination and port site metastases. We undertook a survey to assess the incidence of this occurrence.

Materials and Methods: A total of 50 international urology departments with experts in laparoscopic urological surgery were contacted for this study. Each site was asked to complete a 2-page survey regarding the volume of laparoscopic urological procedures and port site recurrences.

Results: Nineteen sites elected to participate. A total of 18750 laparoscopic procedures were performed, of which 10912 were for cancer. These included 2604 radical nephrectomies, 559 nephroureterectomies, 555 partial nephrectomies, 27 segmental ureterectomies, 3665 radical prostatectomies, 1869 pelvic lymph node dissections, 479 retroperitoneal lymph node dissections, 336 adrenalectomies and 108 procedures listed as other. Tumor seeding was reported in 13 cases (0.1%), including 3 nephroureterectomies for transitional cell carcinoma, 4 nephrectomies (incidental transitional cell carcinoma), 4 adrenalectomies for metastases, 1 retroperitoneal lymph node dissection for testicular cancer and 1 pelvic lymph node dissection for cancer of the penis. Port seeding occurred in 10 cases (0.09%) and peritoneal spread in 3 cases (0.03%).

Conclusions: The incidence of tumor seeding after laparoscopic oncological surgery is rare and does not appear greater than what has been historically reported for open surgery. Tumor seeding seems to be most commonly related to the removal of high grade tumors and deviation from oncological surgical principles.

Editorial Comment

Laparoscopic surgery has evolved to a reliable and safe procedure in urology – if indicated correctly. This paper shows the safety of the procedure in regard to oncological procedures.

Two facts however deserve emphasis and should be kept in mind. First, patients with port metastases might not return to the surgeon or the center where the initial procedure was undertaken, so a certain number of non-reporting is certain. Second, the majority of implantation metastases (n = 7) stems from transitional cancer. This tumor entity therefore might be considered hazardous for laparoscopic procedures and open surgery might be preferable here.

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Extended radical lymphadenectomy in patients with urothelial bladder cancer: results of a prospective multicenter study

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J Urol. 2004; 171: 139-44

Purpose: Previous studies demonstrate a positive correlation between postoperative survival and the extent of pelvic lymphadenectomies in patients with bladder cancer. However, the distribution of nodal metastases has not been examined in sufficient detail. Therefore, we conducted a comprehensive prospective analysis of lymph node metastases to obtain precise knowledge about the pattern of lymphatic tumor spread.

Materials and Methods: Between 1999 and 2002 we performed 290 radical cystectomies and extended lymphadenectomies. Cranial border of the lymphadenectomy was the level of the inferior mesenteric artery, lateral border was the genitofemoral nerve and caudal border was the pelvic floor. We made every effort to excise and examine microscopically all lymph nodes from 12 well-defined anatomical locations.

Results: Mean total number and standard deviation of lymph nodes removed was 43.1 +/- 16.1. Nodal metastases were present in 27.9% of patients. The percentage of metastases at different sites ranged from 14.1% (right obturator nodes) to 2.9% (right paracaval nodes above the aortic bifurcation). By studying cases of unilateral primary tumors or with only 1 metastasis we observed a preferred pattern of metastatic spread. However, there were many exceptions to the rule and we did not identify a well-defined sentinel lymph node.

Conclusions: We strongly recommend extended radical lymphadenectomy to all patients undergoing radical cystectomy for bladder cancer to remove all metastatic tumor deposits completely. The operation can be conducted in routine clinical practice and our data may serve as a guideline for future standardization and quality control of the procedure.

Editorial Comment

These authors performed a meticulous lymphadenectomy together with cystectomy in patients with bladder cancer. In analogy to previous approaches in retroperitoneal lymphadenectomy for testis cancer, the lymph nodes were sampled and ordered according to their anatomic origin.

In general, these data provide interesting information on the rate and the extent of lymph nodular metastases in bladder cancer. Several issues however deserve comments. First, patients with pT1 category (n = 57) only had 1.8 % metastases, whereas pT2a patients had 10.7% and pT2b had 22.2% metastases. All other pT – categories had around 40%, whereas pT4b had 80 % metastases. The percentage of lymph node metastases on all 290 patients was around 3 – 8 % over all anatomical sides, with the exception of the ipsilateral and contralateral paravesical area (14% and 11%). If patients had nodal metastases at level 1 (next to the bladder) 57% of patients of group were also positive at level 2 and 31 % at level 3.

In conclusion nodal metastases next to the bladder indicate systemic disease. To my opinion, this data would rather provide the rationale for systemic chemotherapy in nodular positive patients.

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FEMALE UROLOGY

Urodynamically defined stress urinary incontinence and bladder outlet obstruction coexist in women

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J Urol. 2004; 171 (2 Pt 1): 757-60

Purpose: The definition and significance of female bladder outlet obstruction (BOO) are poorly understood. We identified patients with urodynamic evidence of BOO in a cohort of women with stress urinary incontinence (SUI).

Materials and Methods: Women with SUI were identified from a videourodynamic data base and pressure flow studies were reexamined. Subjects were excluded if detrusor pressures could not be measured. BOO was diagnosed if the maximum flow rate was less than 12 ml per second and detrusor pressure at maximum flow was greater than 20 cm water or maximum detrusor pressure was greater than 20 cm water in those without measurable flow. Clinical and urodynamic characteristics were compared in the obstructed and unobstructed groups.

Results: Of 104 eligible subjects 19 (18.3%) had BOO. Maximum flow rate, mean flow rate and voided volume were significantly less in the BOO group than in the unobstructed group (8.7 vs. 13.5 ml per second, $p = 0.004$, 5.9 vs. 7.9 ml per second, $p = 0.001$ and 180 vs. 272 ml, $p = 0.008$). Detrusor pressure at maximum flow, maximum detrusor pressure and post-void residual volume were significantly greater in the BOO group than in the unobstructed group (28 vs. 15 cm water, $p < 0.0001$, 31 vs. 19 cm water, $p < 0.0001$ and 71 vs. 10 ml, $p = 0.008$). Etiologies of BOO identified in the 19 subjects included prior anti-incontinence or prolapse surgery in 6, neurological conditions in 4, cystocele in 2, dysfunctional voiding in 3 and idiopathic in 5.

Conclusions: SUI and BOO can coexist even in the absence of common causes of obstruction.

Editorial Comment

The authors of this study reviewed their video urodynamic database and analyzed women with stress urinary incontinence (SUI) to identify evidence of bladder outlet obstruction. It was found that of 104 female patients with urodynamic stress urinary incontinence (defined as involuntary leakage from the urethra during increased abdominal pressure in the absence of a detrusor contraction), 19 (18.3%) had bladder outlet obstruction (BOO). Bladder outlet obstruction was diagnosed if there was a maximum flow rate of < 12 cc/sec and a detrusor pressure at maximum flow of > 20 cm, or if no measurable flow was identified that there was a sustained detrusor contraction during the attempt to void of > 20 cm of water. Potential etiologies of bladder outlet obstruction were identified in 14 of the 19 patients including prior surgery, neurological disorder, cystocele, and dysfunctional voiding. Idiopathic etiology was noted in 5 of the 19 patients.

This paper carries a true intrinsic value through its demonstration that stress urinary incontinence and bladder outlet obstruction may synchronously coexist. Critical points of this study do include the notation that patients were standing during the voiding portion of the urodynamic study as opposed to the standard female micturitional sitting position. The effect of this different position on gender specific voiding is unclear. In addition, the pressure flow analysis was completed with a catheter in the bladder as opposed to a catheter free uroflow. Groutz et al. (1) have previously discussed the potential effect of a transurethral catheter on maximum flow rates in obstructed females. One may postulate that perhaps if the patients in this data base had a catheter free uroflow they would not have qualified as obstructed in this study.

The authors highlight the expanding interest in the identification and analysis of bladder outlet obstruction in women. This will especially have great value for the surgeons who must re-operate on patients who have failed a previous anti-incontinence operation and ponder the need to include a formal urethrolisis at the re-operative setting.

Reference

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Nutrient composition of the diet and the development of overactive bladder: a longitudinal study in women

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Aims: Evidence for an association between diet and the symptom syndrome overactive bladder (OAB) would be valuable in understanding its aetiology. The present study investigates prospectively the association between the nutrient composition of the diet and the onset of OAB.

Methods: A random sample of community dwelling women aged 40 years or over was studied. Baseline data on urinary symptoms and diet were collected from 6,371 women using a postal questionnaire and food frequency questionnaire. Follow-up data on urinary symptoms were collected from 5,816 of the women in a postal survey 1 year later. Logistic regression was used to investigate the association of diet (daily intakes of energy, macro and micronutrients) with 1 year incidence of OAB.

Results: There was evidence that three nutrients may be associated with OAB onset. Higher intakes of vitamin D ($P = 0.008$), protein ($P = 0.03$), and potassium ($P = 0.05$) were significantly associated with decreased risks of onset. Although overall the associations with vitamin B6 and niacin were not significant ($P = 0.08$ and $P = 0.13$), there was some evidence of a decreased risk of onset with higher intakes.

Conclusions: The results from this prospective study suggest possible aetiological associations between certain nutrients and OAB onset. The findings need confirmation and possible mechanisms to explain these associations need further investigation.

Editorial Comment

This is a very interesting paper, which expands on the earlier work of these authors regarding dietary associations with overactive bladder (OAB). Their past work noted that lower intakes of either vegetables, chicken or breads were independently associated with increased risks of OAB. In this publication, the authors investigated the association between the onset of symptoms of the OAB and routine dietary composition of a specific population with specific regard to both vitamins and macronutrients. The population examined was analyzed using a validated food frequency questionnaire for population in the United Kingdom. Demographic similarity was pursued by relying on census data (those patients who were from South Asian origin were excluded). The data was accumulated through a food frequency postal questionnaire (FFQ) that had been validated for use in a population of the United Kingdom. Statistical analysis was completed to examine the nutrient intakes of patients who had the onset of new OAB cases after 1 year and compare it to those who did not have the symptom complex both at the baseline and follow-up questionnaire. Each nutrient was analyzed with adjustments made for energy intake, age and the presence of stress urinary incontinence. The authors

found that there was a definite possible ideological association between the onset of overactive bladder and nutrient composition of the diet. Specifically, they found that higher intakes of potassium, protein, and vitamin E were significantly associated with a decreased risk of onset of OAB. In addition, vitamin B6, niacin and retinol intake had an association that was approaching but not quite establishing statistical significance.

With the aging population and the increased incidence of overactive bladder, research such as this is extremely valuable for its potentially cost effective prophylaxis against the onset of this malady. The value of vitamin D and its association with exposure to light gives a measure of scientific support to the common feeling that fresh air and sunlight does have the potential to be restorative to good health. Though the questionnaire was validated to a certain population it would be of genuine interest to have similar questionnaire addressed to other populations which show a strong degree of genetic similarity whether it be in Europe, Asia or Africa. With patients continually pressing physicians for a holistic pathway to retain good health and stave off the common maladies associated with aging, this paper makes for valuable reading to give advice on same.

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PEDIATRIC UROLOGY

Late renal functional and morphological evaluation after non-operative treatment of high-grade renal injuries in children

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Objective: To assess the long-term results in children with high-grade renal trauma who were managed without surgery, as such treatment was initially successful but little is known about the late ipsilateral renal function and morphology.

Patients and Methods: The study included 13 children (nine boys and four girls; mean age 8 years, sd 5) with high-grade renal injury who were managed without surgery between 1997 and 2001, and followed for a mean (sd, range) of 3 (2, 0.5-7) years. The trauma was caused by a motor-car accident in five and falling from a height in eight children, and was on the right in 10 and on the left in three. There was gross and microscopic haematuria in 10 and three patients, respectively. The trauma was graded according to the American Association for Surgery of Trauma, with grades III, IV and V renal injury in six, four and three children, respectively. All patients were treated initially by observation; one required super-selective embolization because of continuing haemorrhage. Three children with progressive urinary extravasation were treated with a percutaneous tube drain and JJ stent for 6 weeks. Patients were discharged after a mean (sd) hospital stay of 9 (6) days. Ultrasonography then showed resolving haematoma in all patients with a mean (sd) size of 7 (2) cm (2). At the last follow-up patients were re-evaluated by a clinical examination, renal scintigraphy and computed tomography angiography.

Results: None of the children was hypertensive nor had any abnormality on urine analysis; all had normal serum creatinine levels, and scintigraphy and angiography showed normal contralateral kidneys in all. Ipsilateral abnormalities were detected in 12 patients, and included a single scar in five, multiple scars in six

and a cystic lesion with multiple septa in one. There was no vascular complication or hydronephrosis, and no significant functional loss, with all affected kidneys having a split function of 41-50% at the last follow-up.

Conclusion: Although there is no late functional loss there are residual morphological changes in almost all children with high-grade renal injury. This study provides objective support for the non-operative management of high-grade renal injury in children, but a prolonged follow-up is warranted to assess the risk of progression of these abnormalities.

Editorial Comment

The authors demonstrate the remarkable results of “non-operative” management of severe renal trauma. Of 6 patients with Grade III, 4 with Grade IV and 3 with Grade V injuries, none required open surgery and despite some morphological abnormalities, none had significant functional loss.

Their data however should be interpreted with some caution however. Seven patients required blood transfusion, one had an arterial embolization and 3 had percutaneous flank drains and internal stent placement. In other words, “non-operative” management has some morbidity and may require procedures. Moreover, this is a select population. No patient in this series had other abdominal injuries, as those patients are managed at a different center. Hence there is a significant selection bias in this series. This leaves unresolved, the question of whether operative intervention may be indicated in patients being operated on for other abdominal injuries. Nonetheless, the authors do demonstrate that impressive results can be obtained in children with major injuries who are managed expectantly.

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Desmopressin for the treatment of nocturnal bedwetting in patients with neural tube closure defects

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Purpose: We evaluated desmopressin (DDAVP) treatment in patients with neuropathic bladder secondary to neural tube closure defects (NTDs) and nocturnal incontinence.

Materials and Methods: We selected 25 patients, that is 10 males (40%) and 15 females (60%), between ages 7 and 16 years (mean 9.8) with neuropathic bladder secondary to NTDs without a ventricular-peritoneal shunt. All had a low pressure bladder and presented with daytime continence between catheterizations but had persistent nocturnal urine loss 7 nights weekly. They underwent treatment with oral DDAVP according to a certain design, namely an initial dose of 0.2 mg for 3 weeks, which was increased to 0.3 or 0.4 mg for another 3 weeks in non responders. The average dose was 0.2 mg. At the effective minimal dose (bedwetting decrease greater than 50%) patients continued for 6 months and then decreased by intervals of 0.05 mg every 2 weeks. In the event of recurrence treatment continued for 1 year.

Results: All patients responded to treatment during the nighttime hours except 1 who suspended treatment after 4 weeks. There were no adverse effects from DDAVP.

Conclusions: Treating nocturnal bedwetting with DDAVP in patients with NTDs was effective and safe. Nevertheless, to our knowledge treatment duration has not yet been determined.

Editorial Comment

The authors study nocturnal enuresis in a select group of children with neurogenic bladder dysfunction. They note that although bladder management in these patients often makes these patients dry during the day, many are wet at night. In this small study, 24 of 25 patients responded to DDAVP by becoming dry at night. There were no complications.

Although this is a creative approach and likely to lead to quality of life improvement in these patients, there are some concerns. First, the authors acknowledge that this is a selected group of patients. However, they do not give the criteria for selection, except for the exclusion of those with a ventriculoperitoneal shunt. Why were these excluded, since they make up the majority of the population of children with neurogenic bladder dysfunction? Moreover, the authors monitored daily weights and electrolytes in the beginning of the study, but provide no data on the results. How did they counsel the patients regarding drinking? Were they placed on evening fluid restriction? If so, might this negatively affect quality of life? Overall, this is a creative and interesting preliminary study of an interesting problem that warrants further examination.

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