
UROLOGICAL SURVEY

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STONE DISEASE

Efficacy of tamsulosin in the medical management of juxtavesical ureteral stones

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J Urol. 2003; 170: 2202-5

Purpose: We evaluated the efficacy of the alpha1-adrenergic antagonist tamsulosin for conservative expulsive therapy in patients with ureteral colic due to juxtavesical stones.

Materials and Methods: A total of 60 consecutive symptomatic patients with stones located in the juxtavesical tract of the ureter were randomly divided into group 1-30 who received oral floroglucine-trimetossibenzene 3 times daily and group 2-30 who received 0.4 mg tamsulosin daily. The 2 groups received 30 mg deflazacort daily for 10 days plus cotrimoxazole 2 times daily for 8 days and 75 mg diclofenac injected intramuscularly on demand. Ultrasound followup and medical visits were performed weekly for 4 weeks. Stone passage rate and time, analgesic use, hospitalization and endoscopic intervention were evaluated. Statistical analysis was performed using the Student t test.

Results: The stone expulsion rate was 70% for group 1 and 100% for group 2. Mean stone size was 5.8 and 6.7 mm, respectively ($p = 0.001$). Mean expulsion time was 111.1 hours for group 1 and 65.7 hours for group 2 ($p = 0.020$). The mean number of diclofenac injections was 2.83 for group 1 and 0.13 for group 2 ($p < 0.0001$). Ten group 1 patients were hospitalized, of whom 9 underwent ureteroscopy, compared with none in group 2 ($p < 0.0001$ and 0.001, respectively).

Conclusions: Tamsulosin used as a spasmolytic drug during renal colic due to juxtavesical calculi increased the stone expulsion rate and decreased expulsion time, the need for hospitalization and endoscopic procedures, and provided particularly good control of colic pain.

Editorial Comment

The likelihood of spontaneous passage of stones in the ureter depends primarily on the size and location of the stone at the time of diagnosis. Although most ureteral stones pass spontaneously, the pain and cost associated with repeated episodes of renal colic is substantial. A number of investigators have evaluated the use of pharmacologic agents to enhance the rate and reduce the pain of spontaneous passage of ureteral calculi and demonstrated a beneficial effect of some medications (references 4 and 6 in the article). The efficacy of corticosteroids and calcium channel blockers has been attributed to their ability to reduce ureteral edema and spasm.

In the current study, Dellabella and colleagues theorized that the use of an alpha-adrenergic antagonist would reduce ureteral peristalsis around an obstructing ureteral stone, thereby increasing urine flow and improving the likelihood of spontaneous passage. In a prospective, randomized trial, these investigators compared tamsulosin with an anti-spasmodic agent (floroglucine-trimetossibenzene) in 60 patients with stones in the intramural ureter. After 4 weeks, all patients in the tamsulosin group successfully passed their stones compared with only 70% in the anti-spasmodic group. Furthermore, patients in the tamsulosin group passed their stones in less time (66 hours vs. 111 hours, respectively) and required less pain medication (0.13 vs. 2.83 injections diclofenac, respectively) than the anti-spasmodic group.

These findings again suggest that pharmacotherapy aimed at decreasing ureteral peristalsis associated with an obstructing stone can reduce pain and enhance spontaneous stone passage. Although few adverse effects from drug therapy have been reported in the current and previous trials, one must still weigh the risks of pharmacotherapy against the benefit of spontaneous stone passage for each patient. The efficacy of alpha-blocker therapy for the management of ureteral stones will need to be confirmed in future trials; however, the

use of adjunctive drug therapy in patients electing to manage their ureteral stones conservatively should be considered.

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Urinary stone size: comparison of abdominal plain radiography and noncontrast CT measurements

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J. Endourol. 2003; 17: 725-8

Background and Purpose: To compare urinary stone size as measured by abdominal plain radiography (AXR) with stone size as measured by noncontrast three-dimensional spiral CT in patients with acute renal colic.

Patients and Methods: Patients presenting to the emergency room of a single institution with urinary stones that were visible on both AXR and noncontrast spiral CT were identified. Two radiologists blinded to the clinical outcomes separately and randomly reviewed all films and measured maximum longitudinal (craniocaudal) and transverse (anteroposterior) stone diameters. The two-tailed paired Student's t-test was used to compare the sizes of each stone on AXR and CT.

Results: Over a 1-year period, 22 patients were identified with a total of 31 urinary stones visible on both AXR and CT. Nineteen stones were located in the kidney, three in the midureter, and nine in the distal ureter. The mean stone size by AXR was 6.1 mm (range 2-13 mm; SD +/- 1.95) in the longitudinal axis and 5.3 mm (range 2-11 mm; SD +/- 1.50) in the transverse axis. The mean stone size by CT was 6.9 mm (range 3-12 mm; SD +/- 1.95) in the longitudinal axis and 6.1 mm (range 2-11 mm; SD +/- 1.50) in the transverse. The differences between AXR and CT measurements did not attain significance in either the longitudinal ($p = 0.67$) or the transverse ($p = 0.25$) axis.

Conclusions: A CT scan provides estimates of stone size that are consistently greater than those of AXR in both the longitudinal and transverse axes. However, for stones between 2 and 13 mm in maximum diameter, these differences do not attain significance. In patients with a history of radiopaque stones in this size range, therefore, AXR may provide useful size data for clinical decision-making without concern about significant disparities between the two modalities. As AXRs are more expeditiously obtained, incur less direct costs, and expose patients to significantly lower doses of radiation than CT scans, they remain a useful adjunctive study in the work-up of nephrolithiasis.

Editorial Comment

It is clear that CT is the most sensitive imaging modality for the detection of renal and ureteral calculi. However, the accuracy of CT compared with abdominal radiography for the measurement of stone size has been debated. A previous report suggested that CT overestimated the craniocaudal dimension of ureteral stones by a mean of 0.8 mm. In contrast the current report by Parsons and colleagues found concurrence between CT and abdominal x-ray (AXR) for both the transverse and longitudinal dimensions, although the measurements were consistently longer (but not statistically significantly so) by CT. Speculation that CT overestimates the longitudinal dimension as a result of volume averaging failed to hold true in this prospective comparison.

Although follow-up imaging after CT diagnosis of stones is best done with AXR from a cost-effective and radiation exposure standpoint, this study suggests that the CT estimate of stone size may reliably be used to make treatment decisions regarding renal and ureteral stones. Conversely, using CT as the gold standard for stone measurement as suggested by in vitro studies (reference 6 and 7 in the article), AXR provides a comparable measure of stone size and may likewise be used for treatment decision-making.

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ENDOUROLOGY & LAPAROSCOPY

Predictive factors for applicability and success with endoscopic treatment of upper tract urothelial carcinoma

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J Urol. 2003; 170: 2209-16

Purpose: We report on endoscopic treatment outcomes for upper tract urothelial carcinoma and identify predictive factors for success.

Materials and Methods: A total of 61 renal units were referred for endoscopic treatment of an upper tract tumor, 69% of which did not have a traditional indication for nephron sparing approaches. Tumor pathology and operative findings were assessed retrospectively for treatment outcomes and influential factors.

Results: Initial ureteroscopic inspection was undertaken in 53 renal units with resection attempted in 18 (34%) resulting in an 89% success rate with 16 treated. A percutaneous approach in 19 renal units (11 after ureteroscopy) was 100% successful in achieving tumor-free status, for a total of 35 renal units successfully treated endoscopically. Surveillance then began on 27 renal units with a recurrence rate of 88% and mean time to recurrence of 5.8 months (range 2 to 20). Of patients undergoing surveillance (31% of whom had high grade disease), 54% remain or have died of unrelated disease, during a mean followup of 21.0 months (range 3 to 48). Higher tumor grade, larger size, renal pelvis location (all $p < 0.01$) and multifocality ($p = 0.05$) significantly correlated with decreased recurrence-free survival, but did not predict failure of local control by endoscopic surveillance.

Conclusions: Although endoscopic techniques can render most patients tumor-free, there is a high associated recurrence rate and many need repeat procedures. Recurrence-free survival is greater in patients with low grade, solitary or less bulky disease. However, rigorous surveillance after endoscopic resection can lead to success even in patients with high grade, multifocal or large volume disease, resulting in preservation of renal units.

Editorial Comment

Among a heterogeneous population of patients with upper tract urothelial carcinoma, two-thirds of whom did not have a traditional indication for renal preservation; tumor size was the most important factor in deciding whether or not to attempt endoscopic resection. Although disease recurrence is increased with higher grade, larger, multifocal or renal pelvic location, once the tumor is resected these factors do not significantly influence whether or not recurrences can be successfully managed with endoscopy. Over half of the patients

who elected to enter surveillance were able to maintain their kidney and avoid extirpative surgery. The price for this is high, in terms of repeated procedures, but motivated patients benefit. The take home message is that even in the presence of high grade, multifocal or large volume disease, kidneys can be preserved.

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Evaluation of synchronous twin pulse technique for shock wave lithotripsy: determination of optimal parameters for in vitro stone fragmentation

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J Urol. 2003; 170: 2190-4

Purpose: The Twinheads extracorporeal shock wave lithotripter (THSWL) is composed of 2 identical shock wave generators and reflectors. One reflector is under the table and the other is over the table with a variable angle between the axes of the 2 reflectors. The 2 reflectors share a common second focal point, making it possible to deliver an almost synchronous twin pulse to the targeted stone. We studied the optimal parameters for in vitro stone fragmentation.

Materials and Methods: Two types of 1 cm artificial stones were used, namely Bon(n)-stones of 3 compositions (75% calcium oxalate monohydrate [COM] plus 25% uric acid, struvite and cystine) and plaster of Paris. The parameters tested were shock wave number (100, 500 and 1,000), shock wave power (8, 11 and 14 kV) and angle between the reflector axes (67, 90 and 105 degrees). After the optimal parameters were determined, we studied the disintegrative efficacy of THSWL for 3 types of human urinary calculi, including COM, calcium hydrogen phosphate (brushite) and cystine. Each stone received 1,000 twin shock waves at 14 kV with an angle of 90 degrees between the reflectors. All experiments were done using a rate of 60 twin shock waves per minute. Following lithotripsy stone fragments were processed and sized. The ratio of the weight of fragments greater than 2 mm-to-total weight of all fragments was calculated.

Results: Optimal stone fragmentation results for THSWL were obtained with the maximum number of shock waves (1,000) and full power (14 kV). There was no significant statistical difference in fragment size or the ratio of fragments greater than 2 mm with the use of different angles except for cystine and plaster of Paris calculi, for which the right angle was most effective. At application of the optimal parameters to human stones THSWL produced small fragment size for COM and cystine stones, while brushite stones were not fragmented to the same extent.

Conclusions: The efficacy of synchronous twin pulse technology improves as the number of shock waves and power increase. A 90-degree angle between the shock wave reflectors is advantageous for certain

stones (that is cystine and plaster of Paris) but it is not a factor for other stone compositions. THSWL has satisfactory disintegrative efficacy for human stones, especially COM and cystine calculi.

Editorial Comment

There are currently 2 dual-head lithotriptors available: the Twinheads (FMD) and the Duet (Direx). In this study, the Twinheads was used to fragment 4 types of artificial stones and 3 types of human urinary calculi. The results of dual head lithotripsy were intriguing, although the assessment of any superiority of this type of lithotripsy over other types is only through comparison of these results to those in other studies (using methods similar to the ones in this study, by many of the same investigators, brushite stones were found to be resistant to several standard lithotriptors while these same stones fragmented well with dual head lithotripsy). It is not clear if any advantage of lithotripsy with the Twinheads machine owes to the same cavitation bubble interaction investigated by Zhong and associates (1) in their studies of dual lithotripsy. Moreover, the other dual head lithotripter currently available (Duet, from Direx) can be set to either synchronous or asynchronous firing, and thus might provide different results. It remains to be seen if dual head lithotriptors will prove better, in terms of either efficacy or safety, than standard ones, but dual lithotripsy might well be the next big thing in shock wave lithotripsy.

Reference

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IMAGING

Radiologic features of Castleman's disease occupying the renal sinus

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Objective: Our purpose was to describe the radiologic findings in five abnormalities in three patients with Castleman's disease occupying the renal sinus.

Conclusion: Common findings such as mild homogeneous enhancement passing through the mass of the collecting system with mild hydronephrosis on contrast-enhanced CT and hypointense signal on T2-weighted images were obtained. Castleman's disease may be considered in a differential diagnosis of a mass occupying the renal sinus, although it is difficult to differentiate from malignant lymphoma.

Abstract Edited

Purpose: To describe the radiologic findings in five abnormalities in three patients with Castleman's disease occupying the renal sinus.

Materials and Methods: We report three patients (two men, one woman; 65 – 73 years old; mean, 69 years old) with proven Castleman's disease involving the renal sinus. In one patient, the mass was unilateral; in the other two, it was bilateral. All five masses were diagnosed histologically at nephrectomy or open surgical biopsy. The histologic types included the mixed form in one patient and the plasma cell type in the other two patients. No lesions, other than those in the renal sinus, were detected in any patient during a radiologic examination of the entire body. One of the three patients was symptomatic (weight loss); the other two were asymptomatic. CT, MRI and angiographic examinations were performed.

Results: The five masses, in three patients, ranged in maximal diameter from 3.0 to 4.5 cm (average diameter, 3.9 cm). All masses had relatively well-defined margins except on the anterior side, where irregular margins were seen. All lesions showed slightly higher attenuation than renal parenchyma on unenhanced CT images and mild homogeneous enhancement on the early phase images. The enhancement persisted to the delayed phase. However, the attenuation of the masses after injection of the contrast agent never approached that of normal renal parenchyma. As a result, all masses showed lower attenuation than renal parenchyma. Moreover, mild hydronephrosis, which was detected as blunting of the calices, was seen in all kidneys associated with a mass in the renal sinus, and the collecting system passed through the masses without being obstructed. On MR imaging, three masses, in two patients, had homogeneous and isohypointense signal relative to that of the renal cortex on T1-weighted images. On T2-weighted images, all masses were homogeneous and hypointense in signal compared with that of the renal cortex. Angiography was performed in one patient. No definite vascular staining was seen at the renal sinus. Both the left renal artery and the left renal vein were patent, and no irregularity of the vascular wall was seen.

Conclusion: Common findings such as mild homogeneous enhancement passing through the mass of the collecting system with mild hydronephrosis on contrast-enhanced CT and hypointense signal on T2-weighted images were obtained. Castleman's disease may be considered in a differential diagnosis of a mass occupying the renal sinus, although it is difficult to differentiate from malignant lymphoma.

Editorial Comment

The abstract of this paper was editorially prepared with the purpose of to call the attention for this relatively uncommon pathological entity, which only recently has been more frequently recognized. Castleman's disease is an uncommon type of hyperplasia of lymphoid follicles that only sporadically occurs in the abdomen and pelvis. Histologically, this disease can be divided into 3: the hyaline vascular type, which is more common (90% of cases), the plasma cell type and the mixed form. It may present as asymptomatic involvement of one lymph node group (unicentric) or as a multicentric disease with systemic symptoms. Unlike localized disease, for which surgical excision is curative regardless of the histological type, multicentric disease often necessitates aggressive systemic therapy and portends a poor outcome. The most frequently sites of involvement are: chest (67-70%); neck (14-40%); retroperitoneum (para-aortic or pararenal space, 5-9%) and mesentery.

The most frequent appearance of abdominal or pelvic Castleman disease is of a single, well-defined enhancing mass simulating either bulky adenopathy, primary retroperitoneal tumor or lymphoma. When the mass occurs in the pararenal space can be associated with hydronephrosis. Calcification is seen in about 30% of the cases. Castleman's disease, although rare, should be included in the differential diagnosis of an isolated well defined solid mass in the retroperitoneum or a soft tissue mass occurring in the renal sinus or in the pararenal space.

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Helical CT for nephrolithiasis and ureterolithiasis: comparison of conventional and reduced radiation-dose techniques

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Radiology. 2003; 229: 575-80

Purpose: To determine the accuracy of unenhanced helical computed tomography (CT) performed at reduced milliampere-second, and therefore at a reduced patient radiation dose, by using conventional unenhanced helical CT as the standard.

Materials and Methods: Fifty patients with acute flank pain who weighed less than 200 lb (90 kg) were prospectively recruited for this study. Conventional helical CT scans were obtained with patients in the prone position by using 5-mm-thick sections, 140 kVp, 135-208 mAs (mean, 160 mAs), and a pitch of 1.5 (single-detector row CT) or 0.75 (multi-detector row CT, 4 x 5-mm detector configuration). Conventional CT was immediately followed by low-dose scanning, whereby the tube current was reduced to 100 mA (mean, 76 mAs). All other technical parameters and anatomic coverage remained constant. Three independent readers who were blinded to patient identity interpreted the scans in random order. The observers noted the location, size, and number of calculi; secondary signs of obstruction; and other clinically relevant findings. High- and low-dose scans were compared by using paired t tests and the signed rank test.

Results: Calculi were found in 33 (66%) patients; 25 (50%) had renal calculi and 19 (38%) had an obstructing ureteral calculus. The accuracy rates (averaged over the three readers) for determining the various findings on the low-dose scan compared with the high-dose scan were as follows: nephrolithiasis, 91%; ureterolithiasis, 94%; obstruction, 91%; and normal findings, 92%. When interpretations between readers were compared, agreement rates were 90%-95% for standard-dose scans and 90%-92% for reduced-dose scans ($P > .5$). Uncomplicated mild diverticulitis was found in three patients. No other clinically important abnormality was identified. A reduction in the tube current to 100 mA resulted in a dose reduction of 25% for multi-detector row CT and 42% for single-detector row CT.

Conclusion: In patients who weighed less than 200 lb, unenhanced helical CT performed at a reduced tube current of 100 mA, and therefore at a reduced patient dose, resulted in scans of high accuracy.

Editorial Comment

There is no doubt regarding the crescent acceptance of the unenhanced helical computed tomography (UHCT) for the investigation of patient with acute flank pain and suspected of having urolithiasis. Although UHCT confers diagnostic advantages and avoids the risks of intravenous contrast medium, this should be considered against the increased radiation dose to the patient (particularly to the gonads). Depending on the protocol used, the average dose of an intravenous urography (IVU) vary from 1.5 to 2.0 mSV while for UHCT the effective dose is usually 4.7 mSV. In other words the total dose of radiation of non-optimized UHCT protocol confers a total dose, which is about three times that of an IVU. This study deals with a very important issue in radiology today, which is how to decrease radiation dose to the patients. This issue became more crucial among radiologists after the introduction of the multidetector row CT (MDCT). This diagnostic procedure has become widely used, particularly in the USA, and has been proven to be a valuable tool for various indications. A major issue using this new modality is the inherent risk of applying increased radiation exposure, when compared to single-slice CT or other imaging modalities. Fortunately, radiologists are now able to save radiation exposure from the use of MDCT by choosing optimized exposure parameters or its superior dose efficiency in comparison to single-slice CT. The use of intelligent tools in these modern equipments, such as ECG- or body shape-based real-time dose modulation, can further reduce the radiation dose.

As we can see all efforts are been doing now by radiologists in order to perform a low-dose CT protocol. While acquiring thin slices with high spatial resolution, we can reduce the dose to similar values as in conventional radiography, especially when examining under high-contrast conditions. Using all these various options available, radiation exposure can sometimes even be lower than using a conventional single-slice helical CT. By using low dose-CT protocol we can reach similar sensitivity, specificity and accuracy. For the detection of urolithiasis, for example, low dose CT protocol is superior to IVU and confers a total dose of 2.8 mSV, which is about double that for IVU and about 75% and 50% of that for non-optimized UHCT protocols. Recently these low dose noncontrast CT protocols has been shown to be useful also for the diagnosis of stones in pregnant women and children.

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UROGENITAL TRAUMA

Does tachycardia correlate with hypotension after trauma?

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Comment in: J Am Coll Surg. 2003; 197: 697

Background: Tachycardia is believed to be closely associated with hypotension and is often listed as an important sign in the initial diagnosis of hemorrhagic shock, but the correlation between heart rate and hypotension remains unproved.

Study Design: Data were collected from all trauma patients, 16 to 49 years old, presenting to our university-based trauma center between July 1988 and January 1997. Moribund patients with a systolic blood pressure $<$ or $=$ 50 or heart rate $<$ or $=$ 40 and patients with significant head or spinal cord injuries were excluded. Tachycardia was defined as a heart rate $>$ or $=$ 90 and hypotension as a systolic blood pressure $<$ 90.

Results: Hypotension was present in 489 of the 14,325 admitted patients that met the entry criteria. Of the hypotensive patients, 35% (169) were not tachycardic. Tachycardia was present in 39% of patients with systolic blood pressure 120 mmHg. Hypotensive patients with tachycardia had a higher mortality (15%) compared with hypotensive patients who were not tachycardic (2%, $P = 0.003$). Logistic regression analysis revealed tachycardia to be independently associated with hypotension ($p = 0.0004$), but receiver operating curve analysis demonstrated that the sensitivity and specificity of heart rate for predicting hypotension is poor.

Conclusions: Tachycardia is not a reliable sign of hypotension after trauma. Although tachycardia was independently associated with hypotension, its sensitivity and specificity limit its usefulness in the initial evaluation of trauma victims. Absence of tachycardia should not reassure the clinician about the absence of significant blood loss after trauma. Patients who are both hypotensive and tachycardic have an associated increased mortality and warrant careful evaluation.

Inconsistent finding of tachycardia in World War II combat casualties

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J Am Coll Surg. 2003; 197: 697

The article by Victorino and colleagues is a welcome reminder that tachycardia does not always accompany severe hemorrhage (1). It is of more than historical interest that American military surgeons recognized the inconsistent presence of tachycardia in wounded soldiers during World War II in some of the earliest clinical investigations carried out on traumatized humans. These data were published in the volume entitled *The Physiologic Effects of Wounds* (2), which is part of the Surgeon General of the Army history of medicine and surgery in World War II. I have summarized some of the more applicable hemodynamic data from Table 8, page 34, and Table 9, page 35, in Table 1, following, although this is no substitute for reading the entire chapter, "Initial State of Entry to Hospital." On average, the casualties (n = 106) were studied some 6 hours after trauma and before the beginning of resuscitation, though some had been given several units of plasma and almost all had received morphine. The most common injuries found in those in severe shock were traumatic amputations, extensively comminuted open extremity fractures, and penetrating thoracic injuries. Measurements of blood volume using a dye dilution methodology were performed in about half of the study population (page 56). Estimated average blood volume losses, as a function of degree of shock, were: none, 14.4%; slight, 20.7%; moderate, 34.3%; and severe, 45.9%. The authors concluded with the following observation (page 34): "The finding that the average as well as the minimum and maximum pulse rates was the same in all degrees of shock was surprising. It is of interest that even patients judged to be in severe shock can have a pulse rate as low as 60 beats per minute." Data such as these and those reported in the article by Victorino and colleagues (1) speak strongly in favor of modifying the long-standing ATLS teaching on the relation of heart rate to hemorrhage.

Table - 1

Degree of shock	Pulse rate,* average (range)	Blood pressure,* systolic/diastolic
None	103 ± 7.2 (70 – 140)	126 ± 11.9 / 75 ± 1.5
Slight	111 ± 3.4 (88 – 150)	109 ± 3.0 / 66 ± 2.7
Moderate	113 ± 3.6 (80 – 160)	95 ± 4.9 / 58 ± 3.5
Severe	116 ± 3.3 (60 – 144)	49 ± 7.6 / 25 ± 5.8

*Standard error of the mean.

References

1. Victorino GP, Battistella FD, Wisner DH: Does tachycardia correlate with hypotension after trauma? *J Am Coll Surg.* 2003; 196: 679–84.
2. The Board for the Study of the Severely Wounded. *The Physiologic Effects of Wounds.* Washington, DC: Office of The Surgeon General; Department of the Army; 1952; 21-74.

Editorial Comment

A major part of modern trauma surgery is determining when patients are at risk of death or disability from ongoing blood loss. This is particularly important when determining if a patient needs open exploration for renal trauma. Most surgeons use a combination of serial hematocrit designations, vital signs, and "clinical judgment" to determine when patients are losing blood rapidly. Two excellent recent reports shed light on the

utility (or lack of utility) of an increased heart rate (tachycardia) in the evaluation of the injured patient. Basically, they determine that tachycardia is not a universally reliable indicator of blood loss. Other determinants such as serial hematocrit or hypotension must be used instead.

In the first report, 14,000 trauma patients were analyzed. While increased heart rate did correlate with hypotension and blood loss, it had poor sensitivity and specificity. The study also found that up to 35% of patients exhibited bradycardia and not tachycardia as a sign of severe bleeding.

The second publication on this subject is a letter, which supports the findings of the Victorino et al. study by invoking a similar study of war wounded from 50 years ago. In this review of 106 battle casualties, the range of pulse rates between those with no blood loss or shock compared to those with moderate and severe blood loss / shock were quite similar. Just as in the more modern series, the overlap made tachycardia nearly useless as a universally-reliable indicator of even the most severe bleeding. Although heart rate should not be completely ignored in the trauma patient, it must be realized that if the heart rate does not correlate with other signs of blood loss, further investigation is warranted. As a single determinant of blood loss, tachycardia is simply not very useful.

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Validity of computerized tomography in blunt renal trauma

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J Urol. 2003;170: 2475-9

Purpose: Improved imaging techniques and new therapeutic possibilities require rethinking the indication for laparotomy with regard to blunt renal trauma. Refined classification systems would facilitate the decision relating to therapy but they are based on knowledge of the imaging accuracy of computerized tomography (CT). We evaluated the validity of the CT depiction of renal injuries.

Materials and Methods: A total of 42 porcine kidneys were subjected to traumatization of various degrees. They then underwent CT examination and were subsequently cross-dissected into slices 3 mm thick. The comparative evaluation involved 2,080 CT images and 1,819 macroscopic sectional views, which showed 3,521 and 3,778 individual lesions, respectively.

Results: Using CT the overall extent of injury in renal trauma was only slightly overrated at an average of 15% higher than that seen on macroscopy. Simple linear lesions tended to be over assessed and parenchymal destruction tended to be under assessed. Central lesions were depicted more frequently than peripheral lesions. CT of medullary lesions and parenchymal detachment was not feasible.

Conclusions: CT of the kidney enables the distinction of different kinds of lesions and their localization well. Pelvic structures or vessels can imitate linear lesions. However, this imaging procedure can be used as a basis for refining categorization systems for blunt renal trauma. It can also be used to obtain a large quantity of lesion data for biomechanical investigations.

Editorial Comment

Computed tomography (CT) is the undisputed state of the art when it comes to evaluating renal injuries. However, despite wide use, and a number of clinical studies supporting its accuracy, few experimental studies

have been published which evaluate the accuracy of CT scanning in renal trauma. Although this study has some shortcomings inherent in the use of animals (experimental model of renal injury may or may not model human injuries well, pig kidneys may not be identical to human kidneys, etc.) it is a valuable experimental look at the correlation between CT imaging and known renal injuries.

In this study, 42 pig kidneys underwent experimental injury and over 2,000 CT images of the kidneys were compared to macroscopic sections of the injured renal units. They concluded: 1) CT overestimates the degree of injury (as scored by the authors own scoring system) by only 15%, 2) Parenchymal disruption is slightly overestimated because of the confounding appearance of normal renal tissue such as blood vessels.

The authors made no attempt to model vascular injury or penetrating injury. Also, they did not attempt to validate CT in evaluating renal trauma in line that corresponded to the 5-part American Association for the Surgery of Trauma (AAST) Organ Injury Severity Scale for the Kidney. However, this study appears to lend experimental support to the common clinical practice of using CT to accurately determine the extent of blunt renal injury.

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PATHOLOGY

Visual estimate of percent of carcinoma predicts recurrence after radical prostatectomy

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J Urol. 2003; 170: 1194-8

Purpose: Tumor volume is an important prognosticator for predicting prostate cancer recurrence following radical prostatectomy (RP). We assessed the ability of the visual estimate of the percent of carcinoma (VEPC) to predict recurrence.

Methods and Materials: As performed by 1 surgeon (MSS), 1,114 men underwent radical prostatectomy between 1992 and February 2002. Patients who had less than 12 months of followup, who underwent salvage RP or in whom VEPC was not assessed in the pathology specimen were excluded. VEPC and other clinical variables were analyzed. We performed univariate analysis using the Kaplan-Meier log rank test. Multivariate analysis using Cox proportional hazards regression was performed.

Results: A total of 692 patients with a mean age of 61 +/- 7 years met the criteria for this analysis. Mean followup was 52 +/- 30 months. Of the patients 17% had biochemical recurrence. Mean VEPC was 25% and 13% in those with and without recurrence, respectively. On univariate analysis all variables were significant predictors of recurrence. However, multivariate analysis showed that the only significant predictors of recurrence were patient age, initial prostate specific antigen 10 ng/ml or greater, RP Gleason 8 to 10, extraprostatic extension, seminal vesicle involvement and VEPC. Based on disease-free survival curves patients were stratified into 3 broad groups, namely low, intermediate and high volume. The HR for biochemical recurrence was 2.1 for the intermediate VEPC group (9.1% to 20%) and 2.7 for the high VEPC group (greater than 20%). In the reference group it was less than 9% (low volume).

Conclusions: VEPC is a simple and inexpensive method that is an independent predictor of recurrence after RP.

Editorial Comment

One of the most controversial aspects of the pathologic assessment of radical prostatectomy specimens is the measurement of the tumor volume. Nevertheless, as yet, there are no defined standards for reporting the cancer volume in prostatectomy specimens. Some institutions have calculated the tumor volume accurately, using computer-assisted image analysis systems. Because this method is not feasible for the routine clinical practice, other investigators have proposed alternative simpler means for measuring tumor volume, including the diameter of largest tumor focus, the number of tumor foci, the number of involved blocks, the percentage of blocks involved, the use of a 3.0 mm squares grid, or naked eye examination of the glass slides after the pathologist had circled all microscopically identifiable foci of carcinoma with a marking pen (pathologist's percentage estimate). Recently, we proposed for estimating tumor volume a simple point-count method accessible to all general pathologists working in routine pathology laboratories (*Int Braz J Urol.* 2003; 29: 113-120).

In the present study, tumor volume was an independent predictor of recurrence after radical prostatectomy. Epstein et al. (*J Urol.* 1993; 149: 1478-1481) analyzed 185 men who underwent radical retropubic prostatectomy for clinical stage B adenocarcinoma of the prostate. Although tumor volume predicted progression, in a stepwise regression analysis it did not provide independent prognostic information. The authors conclude that although an accurate preoperative assessment of tumor volume remains desirable for the management of patients with prostate cancer, the study demonstrated that measurement of tumor volume in radical prostatectomy specimens need not be performed as part of the routine pathological analysis of radical prostatectomy specimens, since it does not provide additional information beyond that of Gleason score and the status of capsular margins.

In a recent paper to be presented in the USCAP meeting in Vancouver and to be published as an abstract in the January (2004) issue of *Modern Pathology*, we studied 123 patients submitted to radical prostatectomy for clinical stages T1c or T2. Using the point-count method for estimating tumor volume, we concluded that shorter time to progression following radical prostatectomy correlated with preoperative PSA and Gleason score but not with tumor extension.

In a paper addressing prognostic factors in prostate cancer by the College of American Pathologists (*Arch Pathol Lab Med.* 2000; 124: 995-1000), tumor volume was considered category II, that is, needs confirmation.

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Collecting duct carcinoma of the kidney: a clinicopathological study of 9 cases

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J Urol. 2003; 170: 1138-40

Purpose: Collecting duct carcinoma (CDC) of the kidney is a rare variant that is associated with an extremely poor prognosis. We report our experience with this variety of cancer in the last 9 years.

Materials and Methods: From 1993 to 2002, 9 patients with CDC were treated at our institution. The diagnosis of CDC was made by a nephrectomy specimen in 8 cases and by renal biopsy in 1. Tumor characteristics, and patient treatment and outcome are reported.

Results: At presentation 1 T1N0M0, 1 T3N0M0, 3 T3N+M0 and 4 T3N+M+ tumors were seen. Mean followup was 13.6 months. Five patients received no complementary treatment. The patient with the T1N0M0

tumor remained free of disease 13 months after nephrectomy and the one with T3N0M0 tumor remained free of disease at 17 months. A patient with a T3N+M+ tumor experienced progression at 1 month, local recurrence at 17 months and was then lost to followup. The 2 other patients with T3N+M0 and T3N+M+ disease, respectively, progressed rapidly and were lost to followup after 5 months. One patient with a T3N+M0 neoplasm received immunotherapy and died after 24 months, while the other with T3N+M0 disease was treated with oral prednisolone and died after 5 months. Finally, 2 patients with T3N+M+ disease received chemotherapy, consisting of 1,250 mg/m² gemcitabine on days 1 and 8, and 70 mg/m² cisplatin on day 1. Each patient achieved an objective response after 3 chemotherapy cycles and remained disease-free 27 and 9 months after nephrectomy, respectively.

Conclusions: CDC is an aggressive variety of kidney neoplasm that is often associated with nodal and visceral metastases at presentation. Our data suggest that combined gemcitabine and cisplatin chemotherapy may be the best therapeutic option for patients with this tumor.

Editorial Comment

Collecting duct carcinoma accounts for approximately 1 per cent of renal cell neoplasms. In spite of its rarity is considered one of the most aggressive variants of renal tumors. No consistent pattern of genetic abnormalities has been established. The morphologic features are characterized by irregular tubules reminiscent of the Bellini collecting ducts set in a desmoplastic stroma. An affinity for the Ulex europaeus lectin supports a collecting duct origin for this tumor.

A differential diagnosis is with renal urothelial carcinoma with glandular differentiation. Favors this latter diagnosis squamous differentiation and dysplastic epithelium or in situ carcinoma in the pelvic urothelium. Another differential diagnosis is the recently described low-grade mucinous and spindle cell carcinoma of the kidney (Mod Pathol. 2002; 15: 182A). Microscopically, it shows tubular structures reminiscent of the thin segment of the loop of Henle. It is a tumor with good prognosis and a striking female preponderance. The immunohistochemistry displays proximal and distal nephronic markers.

A variant of collecting duct carcinoma is the medullary carcinoma of the kidney. This variant was described by Davis, Mostofi and Sesterhen (Am J Surg Pathol. 1995; 19: 1-11) which is believed to arise from the collecting ducts of the renal medulla and is associated with sickle cell trait. The authors coined this tumor as the seventh sickle cell nephropathy. The other 6 are hematuria, papillary necrosis, nephrotic syndrome, renal infarction, inability to concentrate urine and pyelonephritis.

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INVESTIGATIVE UROLOGY

Analysis of the modifications in the composition of bladder glycosaminoglycan and collagen as a consequence of changes in sex hormones associated with puberty or oophorectomy in female rats

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J Urol. 2003;170: 2512-6

Purpose: The effects of female sex hormones on rat vesical extracellular matrix were evaluated by analyzing glycosaminoglycan (GAG) and collagen composition under different hormonal conditions.

Materials and Methods: Bladders were obtained from Wistar rats, including young prepubertal females at age 30 days (YF), and adult intact females (AF), adult oophorectomized females (AOF), adult males and adult sham operated females at age 120 days. Oophorectomy and sham operation were performed at age 30 days. Bladders were analyzed for total GAG and collagen concentration per mg dry tissue and for the contents of GAG species, as determined by agarose electrophoresis and reported as the percent of total sulfated GAG.

Results: Collagen concentration in AF (54.80 +/- 4.60 microg/mg) was different from that in YF (34.52 +/- 5.29 microg/mg, $p < 0.001$) and AOF (63.25 +/- 3.51 microg/mg, $p < 0.001$). GAG concentration in AF (0.71 +/- 0.18 microg/mg) was different from that in YF (0.45 +/- 0.07 microg/mg, $p < 0.001$) and males (0.46 +/- 0.10 microg/mg, $p < 0.001$). The GAG species detected were dermatan sulfate and heparan sulfate. Dermatan sulfate content in AF (90.9% +/- 2.8%) was different from that in YF (86.6% +/- 2.4%, $p < 0.005$), AOF (87.9% +/- 2.1%, $p < 0.005$) and males (87.7% +/- 4.7%, $p < 0.005$). Heparan sulfate content in AF was 9.1% +/- 2.8%, which differed from that in YF (13.4% +/- 2.4%, $p < 0.025$) and AOF (11.2% +/- 2.9%, $p < 0.025$).

Conclusions: Extracellular matrix of the female rat bladder undergoes marked remodeling during normal growth up to early adulthood with important consequences for vesical viscoelastic properties. Also, oophorectomy performed at a prepubertal age may lead to greater vesical wall stiffness.

Editorial Comment

Sex hormones have been shown to variously affect the synthesis of extracellular matrix (ECM) molecules by mesenchymal cells such as fibroblasts and smooth muscles cells, both in vivo and in vitro. This effect is exerted on several tissues and organs and has, in many cases, a normal regulatory role. The ECM may also undergo abnormal modifications, and these have been implicated with many diseases, including urinary tract disorders. In the present study, the effects of female sex hormones on the biochemical composition of vesical glycosaminoglycans (GAG) and collagen in rats under different hormonal conditions were evaluated.

The results show that variations in the plasma levels of female sex hormones parallel different changes in the ECM composition of the rat bladder wall. During the normal growth of the female rat from a pre-pubertal age to early adulthood, there are marked increases in both total GAG and collagen concentrations, together with a small increase in dermatan sulfate and a more important decrease in heparan sulfate. Compared to the intact adult females, the bladders from oophorectomized adult females had a slightly higher collagen concentration but presented no change in total GAG, whereas the dermatan sulfate and heparan sulfate contents were decreased and increased, respectively, which may lead to greater vesical wall stiffness. Bladders from adult males differ from those of females of comparable age in that they have less total GAG, and hence a higher collagen: GAG ratio, and slightly less dermatan sulfate. In conclusion, this work demonstrates that the ECM of the female rat bladder undergoes a marked remodeling during normal growth up, which can lead to important consequences for vesical viscoelastic properties.

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Experimental varicocele induces testicular germ cell apoptosis in the rat

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J Urol. 2004; 171: 501-3

Purpose: We evaluated the impact of experimentally created varicocele on ipsilateral and contralateral testicular germ cells in the rat.

Materials and Methods: Experimental left varicocele was created by partial ligation of the left renal vein in 17 adult male Sprague-Dawley rats. An additional 5 rats that underwent laparotomy and renal vein handling without ligation served as sham surgical controls. Five rats that underwent no surgical or other intervention served as a control group. Rats were sacrificed 7 (5), 14 (5) or 28 (7) days following varicocele creation. Germ cell apoptosis was quantified using a TUNEL assay. The results of this assay are expressed as the number of apoptotic germ cell nuclei per seminiferous tubular cross section. The presence of apoptosis was confirmed by cellular ultrastructure evaluation using transmission electron microscopy.

Results: Control and sham animals were found to have a mean of 0.05 and 0.15 apoptotic germ cells per seminiferous tubular cross section, respectively. Rats sacrificed 7, 14 and 28 days after varicocele creation were found to have 0.15, 0.23 and 0.27 apoptotic germ cells per tubule in the ipsilateral testis, and 0.14, 0.16 and 0.17 apoptotic germ cells per tubule in the contralateral testis, respectively. Compared with control animals a statistically significant increase in the number of apoptotic germ cells per tubular cross section was noted 14 days following varicocele creation in the ipsilateral testis ($p < 0.05$).

Conclusions: The creation of experimental varicocele generated an increase in germ cell apoptosis in the ipsilateral testis at 14 days compared with control animals.

Editorial Comment

Until now, a precise relationship between varicocele and infertility is yet to be clarified. The present study analyzed the testicular germ cell apoptosis in the rat as consequence of experimentally induced varicocele.

The authors used an established animal model for the creation of testicular varicocele for assessing the time impact of such a lesion on germ cell apoptosis. The findings confirmed that the normal Sprague-Dawley rat demonstrates low levels of germ cell apoptosis (0.05 apoptotic germ cells per tubular cross section). Also, the animals subjected to laparotomy without partial ligation of the renal vein demonstrated germ cell apoptosis that was not statistically different from that in normal controls. On the other hand, rats that underwent experimental varicocele creation showed significantly increased levels of germ cell apoptosis in the ipsilateral testis 14 days following varicocele creation.

Although the animal model of varicocele clearly differs from the clinical varicocele seen in humans, the findings of the present study indicate that experimental varicocele creation in the rat generates a time dependent increase in germ cell apoptosis in the ipsilateral testis. These findings may be the explanation of the mechanism by which varicocele exerts a pathological influence on testicular function in a clinical setting.

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RECONSTRUCTIVE UROLOGY

Flap technology for reconstructions of urogenital organs

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Curr Opin Urol. 2003; 13: 483-8

Purpose of Review: The purpose of this review is to summarize the different reconstructive options for urogenital indications. The development of various flap techniques to restore congenital and acquired urogenital defects is presented.

Recent Findings: Various reconstructive techniques have been demonstrated recently. On the basis of the reconstructive requirements, two main techniques can be defined: the standard local or regional flap technique (pedicled flap) and the more sophisticated microvascular free flap technique. Free tissue transplantation (transfer) is a procedure that involves microvascular transplantation of a flap (a fasciocutaneous, muscle or composite flap) in one stage from a donor site in the body to a distant recipient site. The viability of the transplanted flap is maintained by microvascular anastomosis between the flap's vessels (at least one artery and one vein) and recipient vessels. Re-innervation and functioning muscle contraction is achieved by suturing the vessels and a motor nerve in the recipient area to a motor nerve of a free transplanted muscle. After regeneration of the nerve and re-innervation of the transplanted muscle, a functioning free transplanted muscle offers enough contractile capacity and strength to replace the function of the missing muscles at the recipient site. The technique of microvascular free tissue transfer necessitates extensive experience in microvascular technique and this approach could be efficiently applied in cooperation with other specialists. Recent studies show the development and clinical application of these new surgical techniques in urology (e.g. in the treatment of bladder acontractility using innervated free latissimus dorsi muscle and in the use of a free microvascular fillet lower leg flap for the reconstruction of a large pelvic-floor defect).

Summary: Various reconstructive requirements define the techniques for reconstruction. The main principle is to obtain optimal anatomical and functional reconstruction with minimal donor site morbidity. Depending on the etiology of the defect, different reconstructive options are available to optimize the reconstructive result. Optimal reconstruction might best be achieved by adopting an interdisciplinary approach in which the primary objective is to provide the best possible outcome for each patient. This review presents the main indications for and principles of flap selection according to the reconstructive requirements.

Editorial Comment

In reconstructive urology as in many other areas indications and possibilities can be considerably improved by co-operation with other disciplines. The current paper written by an expert plastic surgeon published in an urological journal shows how sophisticated flap techniques can be used in urologic surgery.

Another important aspect is the fact that pre-fabrication as seen by these authors is an alternative for reconstruction of segments in the urinary tract. Contrary to tissue engineering, where the organ is primarily generated in the laboratory to be implanted into the body later on, the pre-fabrication technique composes organs with one or several different flaps in the body itself and transplants or transposes the finished "product" to the desired location when it is ready to use. When we look at the many open questions and problems that need to be solved in tissue engineering before we can apply it on a large scale in urology, pre-fabrication may be a way for a broader clinical use in the nearer future.

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Improved sphincter contractility after allogenic muscle-derived progenitor cell injection into the denervated rat urethra

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Urology. 2003; 62: 958-63

Objectives: To study the physiologic outcome of allogenic transplant of muscle-derived progenitor cells (MDPCs) in the denervated female rat urethra.

Methods: MDPCs were isolated from muscle biopsies of normal 6-week-old Sprague-Dawley rats and purified using the preplate technique. Sciatic nerve-transected rats were used as a model of stress urinary incontinence. The experimental group was divided into three subgroups: control, denervated plus 20 microL saline injection, and denervated plus allogenic MDPCs (1 to 1.5 10^6 cells) injection. Two weeks after injection, urethral muscle strips were prepared and underwent electrical field stimulation. The pharmacologic effects of d-tubocurarine, phentolamine, and tetrodotoxin on the urethral strips were assessed by contractions induced by electrical field stimulation. The urethral tissues also underwent immunohistochemical staining for fast myosin heavy chain and CD4-activated lymphocytes.

Results: Urethral denervation resulted in a significant decrease of the maximal fast-twitch muscle contraction amplitude to only 8.77% of the normal urethra and partial impairment of smooth muscle contractility. Injection of MDPCs into the denervated sphincter significantly improved the fast-twitch muscle contraction amplitude to 87.02% of normal animals. Immunohistochemistry revealed a large amount of new skeletal muscle fiber formation at the injection site of the urethra with minimal inflammation. CD4 staining showed minimal lymphocyte infiltration around the MDPC injection sites.

Conclusions: Urethral denervation resulted in near-total abolishment of the skeletal muscle and partial impairment of smooth muscle contractility. Allogenic MDPCs survived 2 weeks in sciatic nerve-transected urethra with minimal inflammation. This is the first report of the restoration of deficient urethral sphincter function through muscle-derived progenitor cell tissue engineering. MDPC-mediated cellular urethral myoplasty warrants additional investigation as a new method to treat stress urinary incontinence.

Editorial Comment

The idea to enhance urinary sphincter function by injecting in vitro cultivated cells into a dysfunctional sphincter is fascinating. This group as well as others has presented experimental work showing the possible benefit of such a procedure. The authors are the first ones to provide a peer reviewed paper on the outcome of injecting in vitro cultivated progenitor muscle cells. This work is remarkable with regards to two aspects. Apart from an improvement of urethral sphincter function by muscle-derived progenitor cell injection, it also demonstrates the effect of urethral denervation. This denervation resulted not only in a near total loss of function of the skeletal muscle (i.e. rhabdosphincter) but also in a partial impairment of smooth muscle contractility. This confirms clinical findings that autonomic nerve preservation may also have a beneficial effect on urinary continence.

An improvement in sphincter tonus by injecting autologous muscle derived progenitor cell injection has been demonstrated previously by another group (Strasser et al., *Eur Urol.* 2003; 43: A 350). This work was carried out in pigs, which in many ways have more similarity to the clinical situation than rats. However, no peer reviewed published manuscript exists yet.

As it seems we are entering a new period with regards to the treatment of stress urinary incontinence. Instead of just injecting bulking agents or passively closing the urethra with a silicone cuff, we may be able to restore or improve remnant insufficient rhabdosphincter function.

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UROLOGICAL ONCOLOGY

Fluid intake and the risk of tumor recurrence in patients with superficial bladder cancer

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J Urol. 2003; 170: 1777-80

Purpose: High fluid intake has been associated with a decreased risk of bladder cancer development in men. We evaluated whether higher fluid intake can impact tumor recurrence rates in patients with superficial bladder cancer.

Materials and Methods: We conducted a prospective single institution analysis of fluid intake in 267 consecutive patients with superficial bladder cancer undergoing routine bladder cancer surveillance between January 1998 and December 2001. Fluid intake questionnaires, urine cytology and physical examination were routinely performed at each surveillance cystoscopy. Cytological and histological recurrences were recorded. All patients had a minimum followup of 2 years.

Results: No relationship between fluid intake and tumor recurrence was demonstrated. Average daily fluid intake was 2,654 ml daily, which was well within the highest protective level (more than 2,531 ml) previously reported. However, multivariate analysis failed to show a protective effect against recurrence at any level of fluid intake. Increasing age correlated with decreased fluid intake (Pearson's correlation coefficient -0.19, $p = 0.0015$), but did not increase the risk of recurrence ($p = 0.59$). Single fluid intake data correlated with the average of additional fluid intakes (median 5 per patient) in the same patient (Pearson's correlation coefficient, 0.45, $p < 0.0001$). Of the study population 123 patients (46%) experienced 1 or more tumor recurrences (range 0 to 11) within a median followup of 2.6 years.

Conclusions: Our prospective study of fluid intake in patients with superficial bladder cancer at risk for recurrence did not find any association between daily fluid intake levels and tumor recurrence.

Editorial Comment

After having diagnosed and treated his superficial bladder cancer appropriately, the urologist used to urge the patient to "drink a lot". However, under scientific conditions, this advice did not prove to be well founded. The authors conducted a prospective study in 267 consecutive patients, and their results told that fluid intake was not correlated with tumor recurrences. However when looking into the data given in this paper, the difference between all the patients with regard to fluid intake was not high, the overall 24-hour fluid intake being 2.5 L. Fluid intake of those with no recurrences was 2,550 mL and those with recurrences was 2,640 mL. These data in mind it is highly unlikely, even if fluid intake had an impact on tumor recurrences, that a difference of 100 mL per day might be the relevant quantity to have such enormous impact.

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Radiotherapy for men with isolated increase in serum prostate specific antigen after radical prostatectomy

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J Urol. 2003; 170: 1833-7

Purpose: In this retrospective study we determined the results of salvage external beam radiation therapy (RT) to the prostate bed for isolated increase of serum prostate specific antigen (PSA) after radical prostatectomy.

Materials and Methods: A total of 60 patients underwent RT for PSA failure after radical prostatectomy from 1993 to 1999. Median followup was 51 months. Biochemical disease-free survival (bDFS) with a serum PSA of 0.3 ng/mL or less was estimated using the Kaplan-Meier method. Potential prognostic factors were evaluated for significant associations with bDFS.

Results: Median PSA before RT was 0.69 ng/ml. Median radiation dose was 64.8 Gy. The 5-year actuarial bDFS was 45%. There were 32 patients with a minimum followup of 4 years (median 73 months) who experienced a 5-year bDFS rate of 43%. PSA before RT ($p = 0.016$), RT dose ($p = 0.026$), surgical margin involvement ($p = 0.017$) and Gleason score ($p = 0.018$) were identified as prognostic factors for bDFS. A significant association with bDFS was present at 5 years of 65%, 34% and 0% for PSA before RT less than 0.6, 0.6 to 1.2, and greater than 1.2 ng/ml, respectively ($p = 0.036$). Patients with PSA before RT less than 0.6 ng/ml and total RT dose greater than 64.8 Gy had improved bDFS at 5 years compared to all others (77% vs. 32%, $p = 0.04$). Of 60 patients 3 (5%) experienced chronic grade 3 toxicity.

Conclusions: Optimal benefit from salvage RT was achieved in patients with a PSA less than 0.6 ng/ml and doses of RT greater than 64.8 Gy. Early treatment with a sufficiently high dose of RT maximizes the potential for salvage.

Editorial Comment

This paper defines the timing and indication for adjuvant radiotherapy after biochemical tumor recurrences following radical prostatectomy. In conclusion, patients do better if treated at an PSA below 0.69 ng/ml, with a local dose of at least 64.8 Gy, with Gleason scores below 7, and, interestingly, with positive surgical margins. A possible explanation for the latter fact is that patients with positive surgical margins have a higher likelihood of localized microscopic residual disease in the prostate bed. An increasing PSA would more easily indicate local progression of that microscopic disease, whereas increasing PSA in the margin negative group may indicate undetectable distant disease that would not be treated effectively with radiotherapy to the prostate bed. Altogether the results support an earlier the better approach to postoperative radiotherapy.

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Health related quality of life patterns in patients treated with interstitial prostate brachytherapy for localized prostate cancer—data from CaPSURE

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J Urol. 2003; 170: 1822-7

Purpose: We measured the impact brachytherapy monotherapy (BMT) has on general and disease specific health related quality of life (HRQOL) compared to patients treated with radical prostatectomy (RP).

Materials and Methods: We studied 419 men with newly diagnosed prostate cancer who enrolled in CaPSURE (Cancer of the Prostate Strategic Urological Research Endeavor) database whose primary treatment was brachytherapy monotherapy (92) or radical prostatectomy (327). The validated RAND 36-Item Health Survey and the UCLA Prostate Cancer Index were used to measure HRQOL before treatment and at 6-month intervals during the first 2 years after treatment.

Results: Patients treated with BMT or RP did not differ greatly in general HRQOL after treatment. Both treatment groups showed early functional impairment in most general domains with scores returning to or approaching baseline in most domains 18 to 24 months after treatment. Patients treated with BMT had significantly higher urinary function scores at 0 to 6 months after treatment (84.5, SD 18.7) than patients treated with RP (63.3, SD 26.6). Urinary bother scores at 0 to 6 months after treatment were not significantly different between patients treated with BMT (67.7, SD 31.2) and those treated with RP (67.4, SD 29.1). Both treatment groups had decreases in sexual function that did not return to pretreatment levels.

Conclusions: Overall BMT and RP are well tolerated procedures that cause mild changes in general HRQOL. Disease specific HRQOL patterns are different in patients treated with BMT or RP. Baseline and serial HRQOL measurements after treatment can provide valuable information regarding expected quality of life outcome after treatment for localized prostate cancer.

Editorial Comment

This paper nicely reflects the clinically well known pattern of side effects of interstitial brachytherapy in relation to radical prostatectomy. Patients treated with radical prostatectomy had urinary function change scores greater than 15 points below baseline at all time intervals after treatment, when differences of 5-10 points are thought to represent a clinically significant change. The worst change score difference was 0-6 months after treatment (28.8 points below base line values). Significant change score differences between the two groups of patients were detected at all time intervals after treatment ($p < 0.003$). With brachytherapy, significant bowel function change score differences were detected 0-12 month after treatment (3.8 – 13.6 points below baseline values). By 18 months after treatment, no significant change score difference was detected in patients with brachytherapy.

Significant group change score differences were detected at each time interval for both sexual domains, namely sexual function and bother ($p < 0.02$). Bowel impairment differences between patients treated with brachytherapy or radical operative therapy were evident after the first post treatment evaluations only.

In summary, these data clearly show the advantage, at least on a short term basis within the first 2 years, with regard to side effects of brachytherapy over radical prostatectomy. With the good long-term results available now in the literature with regard to the therapeutic outcome, brachytherapy indeed represents a valuable alternative of treatment for localized prostate cancer.

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FEMALE UROLOGY

Perioperative complications: the first 140 polypropylene pubovaginal slings

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J Urol. 2003; 170: 1918-21

Purpose: Two widely used tensionless mid urethral slings currently available are the SPARC polypropylene sling (American Medical Systems, Minneapolis, Minnesota) and the TVT (tensionless vaginal tape, Ethicon, New Brunswick, New Jersey). As with the TVT system, the SPARC has been suggested as an outpatient procedure. We present the early complications of our first 140 slings, based on which we recommend that observation of all patients overnight following the SPARC sling be considered.

Materials and Methods: We retrospectively reviewed the charts of the first 140 patients who received the SPARC polypropylene pubovaginal sling at our institution to evaluate for early complications requiring intervention. Because we wished to evaluate for occult bleeding, we checked the hematocrit on postoperative day 1 in the last 57 patients regardless of blood loss in the operating room.

Results: A total of 6 patients required intervention in the early postoperative period, including transfusion in 4 immediately postoperatively for retropubic bleeding. One patient had presented with pelvic pain and vaginal bleeding 1 week postoperatively and was found to have a large retropubic hematoma that required percutaneous drainage. The final patient was discharged home on postoperative day 1 in stable condition but presented on postoperative day 4 with drainage from a suprapubic incision. She had a perforation through a loop of small bowel that required resection of a short segment of the bowel and removal of the sling. The mean decrease in hematocrit from preoperative to postoperative day 1 was 7.1% (range 1% to 14%) despite a mean intraoperative blood loss in this group of 170 cc (range less than 50 to 700 cc).

Conclusions: We recommend caution with any patient who receives a sling that requires passage of needles through the retropubic space, which can result in occult retropubic bleeding, and dilation of the tract. While visceral injury is exceedingly rare, it must be discussed as a possible risk of the surgery. We continue to advocate SPARC as an excellent sling option but we caution surgeons of the potential complications and urge careful postoperative monitoring. We recommend that SPARC not routinely be considered as an outpatient procedure.

Editorial Comment

The authors retrospectively reviewed the charts of 140 patients who underwent a polypropylene suburethral pubovaginal sling using the SPARC device. The patients' charts were examined and notations were made regarding the rate of post-operative hemorrhage with or without transfusion as well as bowel injury. Based on the review the authors recommend overnight observation after this surgery secondary to potential complications and discourage its performance as an outpatient procedure.

This is another article from two outstanding urologists describing their experience with the SPARC procedure and potential complications of same (1). I feel the paper is excellent and warrants close reading by the interested urologic surgeon. The only shortcoming of the paper I could detect was that though the title claims this paper to be peri-operative complications, the descriptions were fairly limited to that of bleeding and potentially catastrophic bowel injury. Because of the wealth of their experience, the authors have the potential to describe all the complications associated with this specific procedure including dyspareunia, tape erosions, urinary retention, persistent incontinence, as well as anesthetic complications of pneumonia, throat/tracheal irritation etc.

The authors do describe the SPARC being potentially different from the TVT operation secondary to the SPARC system using a "finger guided delivery of the smaller needles from top to bottom". This is somewhat

different from some of the previous descriptions of the operation, which describe a shifting type maneuver of the needle once it perforates the rectus fascia with the needle, then exiting the anterior vaginal epithelium as opposed to a complete finger guided delivery that is done with a formal opening of the urethral pelvic ligament. It may have been of interest to hear the authors' thoughts on whether the bowel injury could have been avoided if the urethral pelvic ligament had been opened and adhesion swept off the back of the pubic bone prior to the passage of the suture ligature carriers. Nevertheless, the authors should be commended in that the paper is excellent for its emphasis to the urologic surgeon that just because one may do an operation as an outpatient, it may not necessarily be the safest route of therapy and that in this specific type of operation overnight stay may be warranted secondary to potential post-operative hemorrhage or bowel injury.

Reference

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The natural history of hydronephrosis after radical hysterectomy with no intraoperatively recognizable injury to the ureter: a prospective study

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Objective: To investigate, in a prospective study, the natural history of hydronephrosis of the urinary tract after radical hysterectomy.

Patients and Methods: From December 1997 to March 2001, 34 patients with localized cervical cancer underwent radical hysterectomy by one gynaecologist, with no intraoperatively identifiable injury to the ureter. Intravenous urography was used routinely before and at 2 and 4 weeks after surgery. The degree of hydronephrosis was graded I - IV.

Results: Urography before surgery showed no abnormal finding in any of the patients, except in one with a unilateral duplex kidney. Hydronephrosis was found in 10 units in the upper tract (grade II in eight, III in one and IV in one) in seven patients (21%) 2 weeks after surgery (one right, three left and three bilateral). All the ureteric narrowing was in the distal ureter. The hydronephrosis disappeared in four units in three patients, but became worse in two units in two patients with bilateral pathology in the fourth week. At 3 months after surgery no hydronephrosis had deteriorated and the hydronephrosis in all units had disappeared by 6 months. The presence of hydronephrosis was significantly correlated with pathological stage and age ($P < 0.05$).

Conclusion: Hydronephrosis was detected after radical hysterectomy even with no intraoperatively recognizable injury to the ureter, but in most the hydronephrosis improved spontaneously and needed no ureteric stenting or surgical intervention.

Editorial Comment

The authors perform a prospective study on the natural history of hydronephrosis after radical hysterectomy. The population was limited to patients who had undergone radical hysterectomy by a single

gynecologist with no intraoperative injury to the ureter. The patients were followed by radiographic imaging using intravenous urography preoperatively then again at 2 and 4 weeks postoperatively. Findings included the presence of hydronephrosis in 10 renal units out of the 34 patients who were included in the study. There was no serial increase in any noted hydronephrosis at the 3 month postoperative check-up and there was radiographic resolution all affected kidneys by 6 months. The value of this study lies in its assisting the urologist in understanding the natural history of incidental hydronephrosis after hysterectomy. Many times the consulting urologist noting this radiographic finding must make the diagnostic and clinical decision to perform ureteric stenting versus percutaneous nephrostomy tube or allow for watchful waiting. This study emboldens those urologists who wish to follow an asymptomatic patient conservatively. The authors should be commended on their study. The paper's value may have been potentially increased if a comment could have been made on whether the patients had undergone cystourethroscopy after intravenous indigo carmine injection during the operation (1) to delineate ureteral patency; in addition, a description of the postoperative urinalysis and serum creatinine in all patients postoperatively with special emphasis on the patients with abnormal radiographic findings and a brief commentary on the patient's symptoms and clinical examination would have been enlightening. One wonders based on this study, what the rate of incidental and clinically significant post operative hydronephrosis would be in patients with patent ureters checked intraoperatively with intravenous indigo carmine.

Reference

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PEDIATRIC UROLOGY

One hundred percent patient and kidney allograft survival with simultaneous liver and kidney transplantation in infants with primary hyperoxaluria: a single-center experience

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Background: Combined liver-kidney transplantation is the definitive treatment for end-stage renal disease caused by primary hyperoxaluria type I (PH1). The infantile form is characterized by renal failure early in life, advanced systemic oxalosis, and a formidable mortality rate. Although others have reported on overall results of transplantation for PH1 covering a wide age spectrum, none has specifically addressed the high-risk infantile form of the disease.

Methods: Six infants with PH1 underwent simultaneous liver-kidney transplantation at our center between May 1994 and August 1998. Diagnosis was made at 5.2 +/- 3.3 months of age, they were on dialysis for 11.8 +/- 2.3 months, and they underwent transplantation at 14.8 +/- 3.0 months of age when they weighed 10.6 +/- 1.7 kg.

Results: At a mean follow-up of 6.4 +/- 1.7 years (range, 3.9 - 8.1 years), we report 100% patient and kidney allograft survival. There were no cases of acute tubular necrosis. Long-term kidney allograft function remained stable in all patients, with serum creatinine values of less than 1.1 mg/dL and a mean creatinine clearance of 99 mL/min/1.73 m² at follow-up. Those who received combined hemodialysis and peritoneal

dialysis pretransplant had lower posttransplant urinary oxalate values than those receiving peritoneal dialysis alone. There was improvement in growth and psychomotor and mental developmental scores after transplantation.

Conclusions: Combined liver-kidney transplantation for the infantile presentation of PH1 is associated with excellent outcome when the approach includes early diagnosis and early combined transplantation, aggressive pretransplant dialysis, and avoidance of posttransplant renal dysfunction.

Editorial Comment

The authors report their experience with a rare but physiologically important disease. Primary hyperoxaluria is a severe, life-threatening disease that results in systemic oxalosis and early renal failure. Treatment of the neonatal renal failure has involved various regimens of "hyperdialysis" along with renal transplantation, as the total body oxalate stores are so high that immediately after successful renal transplantation, severe hyperoxaluria results. Because the enzyme deficiency responsible for the condition is in the liver primarily, renal transplantation alone does not solve the basic problem long-term. Hence, some have advocated combined liver and kidney transplantation, that, when combined with a regimen of "hyperdialysis" preoperatively should be curative.

The authors present their experience with 6 cases in which the infants underwent liver-kidney transplant at a mean age of 15 months. All patients have survived with good renal function at a mean follow-up of 6.4 years. Though this approach is still experimental, the authors demonstrate a remarkable result in children who otherwise would have an extremely high mortality.

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Long-term outcome of laparoscopically managed nonpalpable testes

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Purpose: We evaluated laparoscopic diagnostic findings in 108 impalpable testes, and analyzed the success rate and long-term outcome of either direct laparoscopic orchiopexy or the 2-stage Fowler-Stephens procedure.

Materials and Methods: A total of 84 children with 108 impalpable testes and a mean age of 1.9 years underwent laparoscopy between 1992 and September 2000. Long-term outcome with regard to viability and location of the testes was evaluated. Results: Of the 108 testes 72 were located intra-abdominally, of which 28 were managed by direct laparoscopic orchiopexy, 29 were managed by a 2-stage laparoscopic Fowler-Stephens procedure and 15 were vanishing. The remaining 36 testes were inguinally located during exploration and orchiopexy, except for 5 vanishing testes. In all cases the operation proceeded as planned. After a mean followup of 6.2 years all laparoscopically managed testicles were in a normal scrotal position with normal perfusion as revealed by color flow Doppler sonography. Two testicles became atrophic after a 2-stage Fowler-Stephens procedure. Morbidity was low in all children. Conclusions: The laparoscopic approach allows not only diagnosis, but also adequate therapy regardless of whether direct orchiopexy or a 2-stage procedure is performed. Our long-term results clearly demonstrate that even in the patients undergoing the 2-stage procedure the laparoscopic approach is safe and efficient, and leads to excellent results concerning viability of the affected

testicles. Progress and experience gained during recent years are encouraging in continuing laparoscopic procedures in children.

Editorial Comment

The management of nonpalpable testes has changed dramatically in the past 10 years. Currently in most centers, diagnostic laparoscopy is the procedure of choice. This has been demonstrated clearly to be the procedure of choice for localization of high testes. In some cases, the diagnosis of “vanishing” testes can be made and this is sufficient to avoid further operative intervention. In others the visualization of the exact position of the testis will determine the operative plan. In some cases an inguinal approach is sufficient, but in others an abdominal approach is needed. Based on advances in laparoscopic techniques, most intraabdominal testes can be brought down with using laparoscopic dissection, as either a single- or a two-staged procedure. However the literature is short on long-term results of these procedures.

The authors report their experience with laparoscopic management of 84 children with 108 nonpalpable testes. Ultimately 28 underwent a single-stage laparoscopic orchiopexy and 29 underwent a 2-stage laparoscopic Fowler-Stephens type of orchiopexy. The results at a mean follow-up of 6.2 years are reported. Of the children who underwent the single-stage procedures, all had testes in a normal scrotal position with normal perfusion by Doppler ultrasound. Of those undergoing the two-stage procedure, two had atrophic testes. Although these results are less good, these procedures were, of course, done in a more difficult population with testes that were no doubt higher than the others were. Overall the surgical results are excellent and they were achieved with a minimum of morbidity.

On the other hand, it must be said that the authors use “long-term” loosely. For example, what will the adult testicular size be? Will the epididymis in these patients allow normal sperm development and transport? Will the vas function normally? What will the sperm counts/fertility be? What will the incidence of neoplasia be? What we need in pediatric urology are data that are truly “long-term”.

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