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STONE DISEASE

Computerized tomography guided access for percutaneous nephrostolithotomy

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Purpose: Access for percutaneous nephrostolithotomy (PNL) using conventional fluoroscopic guidance may carry an increased risk of damage to surrounding organs in patients with renal calculi and aberrant anatomy. In these situations cross-sectional anatomical imaging may facilitate safe percutaneous access. We describe our experience with computerized tomography (CT) guided percutaneous access for such patients undergoing PNL.

Materials and Methods: Between June 2000 and December 2001, 154 patients underwent PNL at our institution. Five of these patients (3%) required a total of 6 percutaneous access tracks under CT guidance. All patients in this group had anatomical abnormalities precluding standard access to the collecting system without risk to adjacent organs. These abnormalities included a retrorenal colon in 2 and a severely distorted body habitus due to spinal dysraphism in 3.

Results: Percutaneous access was achieved without complication in all cases. At subsequent PNL 5 of the 6 renal units (83%) were rendered completely stone-free.

Conclusion: CT guided percutaneous access is infrequently required for PNL. However, there is a select group of patients with anatomical anomalies that may predictably require this procedure to facilitate safe and efficacious PNL.

Editorial Comment

Aside from bleeding, the most common cause of morbidity associated with percutaneous nephrostolithotomy (PCNL) is injury to surrounding organs. With widespread use of CT imaging for the diagnosis of renal and ureteral calculi, anatomic features associated with risky percutaneous renal access are often identified. As the same time, patients with stones who are known to be at risk for anatomic anomalies often undergo CT imaging to evaluate the anatomic relations of the kidney to facilitate fluoroscopically-guided percutaneous access. For example, if CT shows that the spleen is located quite posteriorly and underlies the upper pole of the kidney in its lateral aspect, then the percutaneous puncture can be directed more medially under fluoroscopic guidance.

Matlaga and colleagues, however, used CT guidance directly to obtain percutaneous renal access in patients at risk of injury with fluoroscopically-guided access. In doing so they reduced the chance of adjacent organ injury and increased the likelihood of satisfactory percutaneous renal access for PCNL. Although the risk of encountering a retrorenal colon, the most common cause (albeit rare) of colonic injury during PCNL, may not be sufficiently high to justify pre-operative CT imaging in all patient candidates for PCNL, those patients with known anatomic anomalies should undergo cross-sectional imaging as part of the routine preoperative planning process. For those few patients in whom percutaneous renal access cannot be safely obtained under fluoroscopic guidance, CT-guided access offers an effective means of achieving safe, optimal renal access.

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Variability of renal stone fragility in shock wave lithotripsy

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Objectives: To measure, in an in vitro study, the number of shock waves to complete comminution for 195 human stones, representing six major stone types. Not all renal calculi are easily broken with shock wave lithotripsy. Different types of stones are thought to have characteristic fragilities, and suggestions have been made in published reports of variation in the fragility within some types of stones, but few quantitative data are available.

Methods: Kidney stones classified by their dominant mineral content were broken in an unmodified Dornier HM3 lithotripter or in a research lithotripter modeled after the HM3, and the number of shock waves was counted for each stone until all fragments passed through a sieve (3-mm-round or 2-mm-square holes).

Results: The mean \pm SD number of shock waves to complete comminution was 400 \pm 333 per gram (n = 39) for uric acid; 965 \pm 900 per gram (n = 75) for calcium oxalate monohydrate; 1134 \pm 770 per gram (n = 21) for hydroxyapatite; 1138 \pm 746 per gram (n = 13) for struvite; 1681 \pm 1363 per gram (n = 23) for brushite; and 5937 \pm 6190 per gram (n = 24) for cystine. The variation for these natural stones (83% \pm 15% coefficient of variation) was greater than that for artificial (eg, gypsum-based) stones (17% \pm 8%).

Conclusions: The variability in stone fragility to shock waves is large, even within groups defined by mineral composition. Thus, knowing the major composition of a stone may not allow adequate prediction of its fragility in lithotripsy treatment. The variation in stone structure could underlie the variation in stone fragility within type, but testing of this hypothesis remains to be done.

Editorial Comment

A number of clinical series have attempted to retrospectively correlate stone composition with success of shock wave lithotripsy (SWL). However, the ability to predict stone composition preoperatively on the basis of density on plain radiographs or attenuation on CT has been disappointing. Likewise, inconsistency in stone fragmentation among stones of similar composition has further limited our ability to predict SWL outcomes.

Williams and associates evaluated a series of human stones of different compositions as well as artificial stones to assess their susceptibility to and variability of fragmentation with SWL in vitro. Although uric acid and hydroxyapatite stones required the least and struvite and cystine stones the most shock waves to comminute, the variability within each group of stones with similar composition was remarkably high, suggesting that secondary factors, such as additional mineral components or variation in internal structure, also contribute to the overall susceptibility of a stone to SWL fragmentation.

This relatively simple but important study suggests that recent attempts to determine stone composition on the basis of radiographic characteristics may provide less predictive information than previously hoped. Although some generalizations may be made about susceptibility of stones of certain compositions to SWL fragmentation, in any individual case the outcome is less certain due to the large variability in response of stones to shock waves. Thus, knowledge of stone composition in and of itself may provide insufficient evidence on which to base patient selection for SWL.

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ENDOUROLOGY & LAPAROSCOPY

Laparoscopic nephrectomy: assessment of morcellation versus intact specimen extraction on postoperative status

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J Urol. 2003; 170: 412-5

Purpose: We compared pathological evaluation and postoperative recovery in patients undergoing transperitoneal laparoscopic nephrectomy at our institution with morcellated vs intact specimen extraction.

Materials and Methods: A prospective evaluation of 57 consecutive patients undergoing radical and simple transperitoneal laparoscopic nephrectomy was reviewed. One patient was excluded from study due to transitional cell carcinoma, which was detected intraoperatively. The 33 morcellated specimens were extracted at the umbilical port and the 23 intact specimens were extracted through a midline infraumbilical incision. Data were obtained on narcotic requirements, hospital stay, complications, estimated blood loss, mass size based on preoperative imaging, specimen weight and extraction incision length.

Results: Mean incision length in the morcellated and intact specimen removal groups was 1.2 and 7.1 cm, respectively ($p < 0.001$). No significant differences in pain or recovery were noted between the 2 groups. Two cases of microscopic invasion of the perinephric adipose tissue in the intact specimen group were up staged from clinical T1 to pT3a disease. No change in patient treatment was made based on this information.

Conclusions: We did not find a significant difference in surgical time, pain or hospital stay. Only incision length was statistically significant. Postoperative recovery appeared to be similar in these 2 groups. With modern imaging modalities information on pathological stage did not alter patient treatment.

Editorial Comment

Although prospective, this study was non-randomized. The authors report that “the decision to morcellate or perform intact extraction was based solely on patient preference”. There were some differences between the groups, including patients that were older (mean age of 54.6 vs. 61.5 years, $p = 0.03$) and larger (BMI of 31.7 vs. 27.9) in the morcellated group. The mean operative time was only 11 minutes longer in the morcellated group. Unfortunately, the authors did not report the operative time for extraction separately. It would have been informative to compare the operative time after complete dissection of the kidney, to determine if the longer extraction time in the morcellated group was outweighed by the longer time to close the incision in the intact extraction group. Entrapping a specimen in the Cook LapSac is a challenging task, which the authors appropriately bemoan in their discussion section, and I would think that in most surgeon’s hands it would take longer to entrap and morcellate a specimen than to close the 7.1 cm average incision for intact extraction. That the authors of this study managed to perform morecellation in only 11 minutes longer than they took to perform intact extraction, especially given the greater BMI in the morcellated group, is a testament to their skill. The major finding of this study is the lack of benefit in terms of patient convalescence in the morcellation group, despite the smaller incision. This leaves cosmetics as being the only advantage of morcellation. There are a number of potential advantages to intact extraction. With intact extraction, pathological staging is possible. There is a growing body of evidence, however, that there is little prognostic difference between clinical T1 renal cancers that are confirmed as pT1 and those that are upstaged to pT3a. In addition, there is concern that morcellation might increase the risk of port implantation. Fortunately, there have been only 3 reported cases of port site implantation of renal cell carcinoma, and 2 of them occurred after inappropriate blind morcellation in a plastic bag. My conclusion is that port site implantation is not a significant concern with renal cell carcinoma

and that there is minimal benefit to the pathological staging provided by intact extraction. Given this, and the findings of this study, the only difference between intact extraction and morcellation is improved cosmetics in the last. As such, I prefer morcellation unless the specimen is very large (> 750 grams), in which cases I use hand-assistance (and therefore intact extraction) to simplify dissection and entrapment.

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Prospective randomized comparative study of the effectiveness and safety of electrohydraulic and electromagnetic extracorporeal shock wave lithotriptors

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Purpose: We compared the efficacy of 2 shock wave energy sources, electrohydraulic (Dornier MFL 5000, Dornier MedTech, Wessling, Germany) and electromagnetic (DLS, Dornier Lithotripter S, Dornier MedTech), for the treatment of urinary calculi.

Materials and Methods: A prospective randomized study of 694 patients with urinary stones was conducted during 12 months to compare the efficacy of the 2 machines. Entrance criteria were radiopaque single or multiple stones at any location within the kidney or the ureter, 25 mm or smaller that had not previously been treated by any means. Patients with congenital anomalies were excluded from this study with all other contraindications for extracorporeal shock wave lithotripsy. Following lithotripsy a plain abdominal film and tomograms were done 1 week after each session to determine if there were residual stones and assess the need for re-treatment. Patients were evaluated 4 weeks after lithotripsy by plane abdominal x-ray and spiral computerized tomography. Success was defined as no residual stones. Univariate and multivariate statistical analyses were performed for different variables that may have an impact on the success rate, including the type of lithotripter. Comparisons of treatment parameters, complications and success rate for both lithotriptors were done.

Results: Of 9 variables examined with univariate analysis 6 had a significant impact on the success rate. Of these 4 maintained their statistical impact on multivariate analysis. These were side, site of the stones, renal morphology and type of lithotripter. Treatment time was significantly shortened for DLS (54 ± 32.9 minutes compared to 65.7 ± 44.7 for MFL, $p < 0.001$). The re-treatment rate was lower for DLS at 34% versus 51.6% for the MFL ($p < 0.001$). The overall success rate was 85.4%. It was 88.5% for DLS compared to 82.4% for MFL ($p = 0.03$). No statistically significant difference between the lithotriptors was noted for ureteral calculi ($p > 0.05$). The success rate was higher in the DLS group for renal stones especially lower caliceal and pyelic stones ($p < 0.05$). The success rate was higher in DLS group for stones 10 mm or smaller, 92.8% versus 85.3% for MFL ($p = 0.03$). The success rate was comparable in both groups for stones larger than 10 mm (81.8% for DLS versus 77.9% for MFL, $p > 0.05$). No statistically significant difference was found in the complication rate for the groups. Steinstrasse were noted in 4% of patients treated with MFL and 3% of those treated with DLS. Subcapsular hematomas were noted in 2 patients in each group. No procedures after extracorporeal shock wave lithotripsy were needed in either group.

Conclusions: The electromagnetic lithotripter (Dornier lithotripter S) has significant clinical advantages over the electrohydraulic lithotripter (Dornier MFL 5000) in terms of treatment time, re-treatment rate and success rate, although there is no difference in the complication rate.

Editorial Comment

As nice as it would be to conclude that this study provides definitive evidence with regards to one energy source over another, as the authors would like us to believe as suggested by their stress on the energy source rather than the particular lithotripter throughout the text, it does not do that. Other differences between the lithotriptors make this conclusion invalid. The focal zone is 224 mm² in the MFL and 175 mm² in the DLS. The number of shock wave delivered was not provided. One might conclude reasonably, however, that indeed the DLS is a better machine than the MFL – primarily owing to the lower retreatment rate. Since the MFL is no longer in production, this information is not all that useful. One finding in the study that is very useful, however, is the minimal (0.6 %) rate of hematoma formation overall, despite the use of sensitive CT scans for surveillance. Other studies have suggested that hematoma formation might be more frequent with either machine, and given the sensitive radiographic assessment in this study I find this reassuring.

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IMAGING

Multidetector CT angiography for preoperative evaluation of living laparoscopic kidney donors

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Purpose: The purpose of this study was to determine the accuracy of multidetector CT (MDCT) angiography as the primary imaging technique in the evaluation of living kidney donors.

Material and Methods: Seventy-four consecutive living kidney donors (30 men, 44 women; mean age, 41.7 years) who underwent MDCT were evaluated. CT examination was performed with 120 mL of IV contrast material at an injection rate of 3 mL/sec and a pitch of 6. In every case, arterial and venous phase volumetric data sets were acquired at 25 and 55 sec, respectively. Scans were reconstructed at 1-mm intervals for three-dimensional (3D) imaging using a volume-rendering technique. Axial CT images and 3D CT angiography were evaluated prospectively by one reviewer and retrospectively by two reviewers who had no knowledge of surgical results. Surgical correlation for the location of primary and accessory renal arteries, early branching of the renal arteries, and renal vein anomalies was made.

Results: Seventy-two subjects underwent left nephrectomy, and two subjects underwent right nephrectomy because supernumerary left renal arteries were detected on preoperative CT angiography. Eighteen supernumerary renal arteries (two arteries to 16 kidneys and three arteries to one kidney) to 74 kidneys underwent nephrectomy. CT and surgical findings agreed in 93% of subjects (the average of three reviewers; range, 89–97%). Two small accessory renal arteries were missed by all three reviewers. Those arteries were diminutive and were thought to be insignificant by the surgeons. Early branching of the renal arteries was shown in 14 arteries, and CT and surgical findings agreed in 96% (the average of three reviewers; range, 93–97%). Renal vein anomalies were present in eight subjects, and CT and surgical findings agreed in 99% of the cases (range, 96–100%).

Conclusions: MDCT angiography is highly accurate for detecting vascular anomalies and providing anatomic information for laparoscopic living donor nephrectomy.

Editorial Comment

Radiological imaging plays an important role in the evaluation of potential living related kidney donors since anatomical and functional assessment of the donor kidney is mandatory. This is particularly critical when laparoscopic donor nephrectomy is performed. As we know, arterial and venous anomalies are more frequently found in the left kidney. Since this kidney is usually preferred for laparoscopic nephrectomy, the demonstration of arterial or venous anomalies is essential for the success of the surgical procedure. Single-slice helical CT angiography with advanced 3-D techniques provides detailed description of the vascular, parenchymal, and collecting system and is considerably a method with high accuracy for detecting vascular anomalies and provides anatomical information. It may be used as the primary tool for donor evaluation since additional useful information can be obtained: cortical cysts, duplex collecting system, hydronephrosis and renal stone. Recently several reports have shown high accuracy of single-slice CT angiography in demonstrating accessory arteries (78-98%), early arterial branching (89-99%), and renal / perirrenal venous anatomy (90-99%) as pointed out in this manuscript. These rates are not significantly different from those obtained with MDCT, 89-97%, 93-97% and 96-100%, respectively. The use of the recent technology of multi-slice CT known also as multi-detector CT, has several advantages over single-slice technology (better vascular opacification and higher spatial resolution) and few but important drawbacks (higher dose of ionizing radiation and potentially nephrotoxic contrast agents). In order to avoid such problems one might consider using MR angiography, which is also very important method for the preoperative evaluation of living kidney donors. Preoperative CT and MR angiography of the renal arteries in renal donors demonstrate substantial agreement and similar high rates of accuracy. MR angiography has the advantage of avoiding ionizing radiation and potentially nephrotoxic contrast agents.

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Contrast enhances color Doppler endorectal sonography of prostate: efficiency for detecting peripheral zone tumors and role for biopsy procedure

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J.Urol. 2003; 170: 69-72

Purpose: We evaluated the accuracy of contrast enhanced color Doppler endorectal ultrasound to guide biopsy for the detection of prostate cancer.

Materials and Methods: A total of 85 patients were evaluated with gray scale and color Doppler before and during intravenous injection of ultrasound contrast agent made of galactose based air micro bubbles. Our biopsy protocol was performed during contrast injection. An additional 18 directed cores were obtained based on contrast-enhanced imaging. Diagnostic efficiency with and without contrast medium injection for detecting prostate cancer was compared based on biopsy results.

Results: Cancer was identified in a total of 58 biopsy sites in 54 patients. Gray scale imaging revealed 96 abnormal hypoechoic nodules or irregular zones inside the outer gland, of which 48 were malignant on

pathological evaluation. Contrast enhanced color Doppler had higher sensitivity (93%) than unenhanced color Doppler (54%), while specificity increased only 79% to 87% for enhanced imaging. Nine of 10 isoechoic suspicious zones were depicted with enhancement, while unenhanced Doppler detected 7 of them. There was no significant difference between the intensity of enhancement and tumor Gleason scores.

Conclusions: Contrast enhanced color Doppler endorectal sonography increases the detection of prostate cancer. Improvement in sensitivity was high, while the difference in specificity was not as pertinent. It is accurate when using a common and routine application ultrasound unit. This technique is easy to perform and not time-consuming. Obtaining additional biopsy cores of suspicious enhancing foci significantly improves the detection rate of cancer.

Editorial Comment

Color Doppler ultrasound (CDUS) has already been proved to be of a great value as a complementary method for the detection of prostate cancer during transrectal guided biopsy. Although it has proven utility, unfortunately, this method is not used routinely in many centers. Some of the reasons may be explained by the fact that CDUS of the prostate requires high resolution modern equipments (with power Doppler), dedicated and experienced sonographer and appropriate control settings. The use of energy Doppler (Doppler angiography, power Doppler) is better than velocity Doppler in order to demonstrate subtle area of abnormal flow (areas with increased neovascularity). This occurs because energy Doppler is not dependent of the angle of the ultrasound beam. The use of microbubbles as an echo-contrast improves the ability of CDUS to better demonstrate the neovascularity associated with cancer. We have found that this phenomenon is particularly useful in large prostate gland (> 60 grams), prostate gland with isoechoic peripheral zone and prostate gland showing 2, 3 or more suspicious areas. Obviously 2 or 3 cores of the area with abnormal flow must be taken additionally to the cores obtained by the systematic biopsy. In our department routinely used CDUS without and with echo-contrast demonstrated respectively, 8% and 15% of cancer not seen on gray-scale US examination (isoechoic cancer) (1). The authors present a high sensitivity and specificity of the contrast enhanced CDUS (93 and 87% respectively). Other studies has been shown that Doppler angio-sonography (power Doppler) with eco-contrast increased the detection of prostate cancer from 38 % to 85% with an 80% specificity (2). There is no doubt that power Doppler ultrasound, preferably with eco-contrast should be used routinely during transrectal biopsy of the prostate. This technique is particularly helpful in normal appearance prostate gland (mainly those larger than 60 grams), prostate with more than one suspicious area and in patients with negative biopsies and rising PSA.

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UROGENITAL TRAUMA

Improvement of hemostasis in open and laparoscopically performed partial nephrectomy using a gelatin matrix-thrombin tissue sealant (FloSeal)

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Objectives: Long-term follow-up studies have demonstrated that effective local tumor control and long-term tumor-free progression rates can be achieved by nephron-sparing surgery. However, hemostasis is a major issue, and the lack of effective means of hemostasis has limited the wider use of the laparoscopic approach to nephron-sparing surgery.

Methods: Between January 2001 and April 2002, 25 patients with renal cell carcinoma were treated with partial nephrectomy using a two-component tissue sealant (FloSeal). The median age was 54 years (range 42 to 71). The follow-up time was 1 to 12 months (median 3.5). The tumor diameter ranged from 2 to 5 cm (median 2.8). Fifteen cases were performed by open retroperitoneal surgery, and 10 cases were performed laparoscopically. The two-component tissue sealant (consisting of a gelatin matrix granula component and a thrombin component) was applied after resection of the tumor and before perfusion of the kidney. The following parameters were recorded: time until complete hemostasis was achieved; decrease in postoperative hemoglobin level; postoperative bleeding; and presence or absence of a perirenal hematoma 24 hours and 10 days postoperatively by ultrasonography.

Results: After application of the tissue sealant for 1 to 2 minutes to the moist resection site, hemostasis was immediate in all cases. During the laparoscopically performed partial nephrectomies, a laparoscopic applicator was used to avoid wasting the tissue sealant within the dead space of the instrument. When reperfusion of the kidney was established, hemostasis was maintained. The decrease in postoperative hemoglobin level ranged from 0.3 to 1.2 points (median 0.7). None of the patients required blood transfusions. No postoperative bleeding occurred. The ultrasound examination 24 hours and 10 days postoperatively demonstrated the absence of a significant perirenal hematoma.

Conclusions: The two-component tissue sealant FloSeal provided immediate and durable hemostasis in open and laparoscopically performed partial nephrectomies. The tissue sealant may provide a tool to expand the possibilities of laparoscopic nephron-sparing surgery.

Editorial Comment

Major bleeding is an issue for both renal trauma surgery and partial nephrectomy. In this study, the authors validate the use of a novel thrombin hemostatic agent that works much better than any similar material from the past, for use against bleeding seen in laparoscopic partial nephrectomy. Although not specifically a trauma study, I believe that the hemostasis seen in this study could also be welcome in renal trauma surgery (renorrhaphy). In the past, few hemostatic agents had been truly helpful in stemming hemorrhage from the bleeding kidney, and intraoperative and postoperative blood loss remained a problem. Worse, during some renal trauma surgery, potentially salvageable kidneys were removed iatrogenically because of brisk bleeding. Now, the invention of highly concentrated thrombin in a gelatin matrix (FloSeal; Baxter) allows the stemming of even spurting blood, and forms a clot, which is both strong and lasting. This will surely decrease the nephrectomy rate during attempted renorrhaphy.

Company literature shows Floseal stopping bleeding from experimentally lacerated porcine heart and inferior vena cava. The clot that is formed is not pushed out by the pressure of blood, even in the heart. I have

personally validated these findings in pigs, where FloSeal stopped bleeding from stab wounds to the liver, spleen and kidney almost instantaneously, and stopped bleeding from lacerated IVC after 3 minutes of light pressure with a moist sponge. In humans, I have used FloSeal in open partial nephrectomy with identically excellent results to this paper. No renal vessels needed ligation, and no persistent or late bleeding was seen. A second application of Floseal is sometimes needed if the first application does not stop all the bleeding. Warm ischemia time is decreased to minutes, even in large partial nephrectomy cases.

In this study, Floseal was used in 25 partial nephrectomy patients as the sole means of bleeding control. 15 had open operations and 10 had laparoscopic surgery. Average time to complete hemostasis was less than 2 minutes, and no patients had postoperative bleeding. Finally, it appears that a very effective hemostatic agent is available for our everyday use.

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Effect of an institutional policy of nonoperative treatment of grades I to IV renal injuries

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Purpose: Nonoperative treatment of serious renal injuries has been advocated and yet to our knowledge the optimum level of operative treatment has not been established to date. We report a unique data set, in which patients with severe renal injuries were treated with an ultraconservative nonoperative approach during a period when urological consultation was not available at a major urban trauma center.

Materials and Methods: We retrospectively reviewed the charts of 51 patients identified with renal trauma in the Detroit Receiving Hospital trauma database from 1997 to 2001.

Results: Injuries were grades I to V in 15, 7, 11, 14 and 4 cases, respectively, and had a tendency toward serious injury. Renorrhaphy was never performed. Nephrectomy was done sparingly, only for grade V renal injuries and only in patients who were exsanguinating from the kidney. Two of the 4 patients with grade V injury died of multiple injuries, including massive head injuries. Only 2 of the patients treated nonoperatively (4%) had complications, including fever and hematuria in 1 each.

Conclusions: This data set seems to support an ultraconservative approach of limiting renal surgery to only patients with active exsanguination. The nephrectomy rate for 14 grade IV injuries, including some gunshot wounds to the kidney, was 0%. When comparing this rate with that in the literature, we would expect it to be 1 patient to as high as 10. This approach was safe and resulted in a low complication rate of 4%. Series in which more aggressive therapy for renal injuries is advocated should compare favorably to ultraconservative therapy if aggressive therapy is to continue to be widely advocated.

Editorial Comment

Most renal trauma literature is written by urologists, but at many centers the General Surgery trauma team not the urologist dictates what therapies are provided to injured patients. In some cases the trauma surgeons may elect not to consult the urology service, or they may elect to remove a briskly bleeding kidney even before urology can be notified. At our trauma center, the trauma surgeons, many of them internationally famous

names, correctly (I believe) determined that most severely injured kidneys healed without the need for surgery. Even 6 patients with gunshot wound were given a trial of conservative therapy - all of them successfully. Only those who were actively bleeding to death (in the estimation of the attending general surgeon) had renal surgery, and that was a speedy nephrectomy in all cases. In this way, these surgeons have turned classic urologic trauma teaching on its head, reducing the operative rate over that reported in previous urologic series, and most importantly decreasing the rate of nephrectomy towards 0% for Grade I-IV injuries. This series mirrors the general trend towards conservative therapy in trauma, and reports like it must be closely followed by anyone with an interest in treating renal injury. Less is turning out to be more in the field of renal trauma. While it takes more courage to observe the patient than go to the operating room, it may ultimately turn out to be the best treatment in the majority of patients.

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PATHOLOGY

Multiple measures of carcinoma extent versus perineural invasion in prostate needle biopsy tissue in prediction of pathologic stage in a screening population

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The capacity of perineural invasion by carcinoma in prostate needle biopsy tissue to independently predict pathologic stage in radical prostatectomy tissues remains uncertain. We sought to determine, in a prostate specific antigen-based screening population, the ability of needle biopsy histologic grade, tumor extent, and perineural invasion to independently predict pathologic stage and margin status in the whole prostate gland. Perineural invasion, Gleason grade, percentage Gleason pattern 4/5 carcinoma, and multiple measures of needle biopsy tumor extent, including number of positive cores, percentage of positive cores, total percentage of carcinoma, greatest percentage of carcinoma in a single core, and total carcinoma length in millimeters, were captured for 215 men from a prostate specific antigen-based screening program diagnosed with prostate cancer in a median of six procured needle biopsy cores. Pathologic stage and surgical margin status were evaluated in corresponding completely embedded radical prostatectomy specimens. A logistic regression model was used to relate the endpoints of extraprostatic extension by carcinoma and/or positive margins to needle biopsy tissue findings. In univariate analyses, total percentage of carcinoma ($p = 0.003$), greatest percentage of carcinoma in a single core ($p = 0.004$), total tumor length in millimeters ($p = 0.009$), and fraction of positive cores ($p = 0.02$) were all significantly associated with extraprostatic (pT3) carcinoma, whereas all five measures of carcinoma extent in needle biopsy tissue were related to positive margins. Correlation coefficient determinations showed that all five measures of needle biopsy carcinoma extent were highly interrelated. In multivariate analyses, total percentage of carcinoma was significantly related to pathologic T stage ($p = 0.003$) and positive margins ($p = 0.0002$). In a multivariate model with the radical prostatectomy whole gland endpoint of either pT3 disease or positive margins, fraction of positive cores ($p = 0.00001$) was the only variable with significant predictive value. Perineural invasion by carcinoma in needle biopsy tissue was detected in 11% of cases. Neither presence

nor absence of perineural carcinoma nor number nor percentage of positive nerves related to pathologic stage in univariate or multivariate analyses. Amount of carcinoma in prostate needle biopsy tissue, using multiple measurements but not perineural invasion, is a significant histologic attribute predictive of pathologic stage and margin status for men with prostate specific antigen screening detected prostatic carcinoma. Reporting of several measures of carcinoma extent in needle biopsy tissue is recommended.

Editorial Comment

The significance of perineural invasion in needle biopsies is a controversial issue. Bastacky et al. (Am J Surg Pathol. 1993; 17: 336-41) from Johns Hopkins University found perineural invasion in 20% of needle biopsies with a specificity of 96% to predict extraprostatic extension. According to these authors, measuring perineural invasion on needle biopsy helps to identify extraprostatic extension and may help in planning nerve-sparing radical prostatectomy in the decision of whether to sacrifice part or all of the neurovascular bundle on the side of the biopsy. Based on this study, in 1994, the American College of Pathologists recommended to include this finding in the pathology report.

Egan & Bostwick (Am J Surg Pathol. 1993; 17: 336-41) from Mayo Clinic found perineural invasion in 36% of needle biopsies with a specificity of 70% to predict extraprostatic extension. However, in a multivariate analysis, only pre-operative PSA, extent of tumor in the biopsy and Gleason grading were statistically significant. The authors conclude that the finding of perineural invasion in needle biopsy of prostatic carcinoma has no independent predictive value for the presence of extraprostatic extension. Accordingly, they recommend no longer routinely evaluate this finding in biopsy specimens.

The paper of this editorial comment favors the findings of Egan & Bostwick. However, the controversy is far from being settled. More studies are needed for a clear significance of perineural invasion in needle biopsies.

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Comparisons of outcome and prognostic features among histologic subtypes of renal cell carcinoma

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Am J Surg Pathol. 2003; 27: 612-24

Our objective was to compare cancer-specific survival and to examine associations with outcome among the histologic subtypes of renal cell carcinoma (RCC). We studied 2385 patients whose first surgery between 1970 and 2000 was a radical nephrectomy for sporadic, unilateral RCC. All RCC tumors were classified following the 1997 Union Internationale Contre le Cancer and American Joint Committee on Cancer guidelines. There were 1985 (83.2%) patients with clear cell, 270 (11.3%) with papillary, 102 (4.3%) with chromophobe, 6 (0.3%) with collecting duct, 5 (0.3%) with purely sarcomatoid RCC and no underlying histologic subtype, and 17 (0.7%) with RCC, not otherwise specified. Cancer-specific survival rates at 5 years for patients with clear cell, papillary, and chromophobe RCC were 68.9%, 87.4%, and 86.7%, respectively. Patients with clear cell RCC had a poorer prognosis compared with patients with papillary and chromophobe RCC ($p < 0.001$). This difference in outcome was observed even after stratifying by 1997 tumor stage and nuclear grade. There was no significant difference in cancer-specific survival between patients with papillary and chromophobe RCC ($p =$

0.918). The 1997 TNM stage, tumor size, presence of a sarcomatoid component, and nuclear grade were significantly associated with death from clear cell, papillary, and chromophobe RCC. Histologic tumor necrosis was significantly associated with death from clear cell and chromophobe RCC, but not with death from papillary RCC. Our results demonstrate that there are significant differences in outcome and associations with outcome for the different histologic subtypes of RCC, highlighting the need for accurate subtyping.

Editorial Comment

Molecular genetics had an impact on classification of renal cell tumors. The genetic alterations affect the biology of the tumor cells, in respect of proliferation, cell death, differentiation, and cell adhesion; these very properties play a role in determining both the morphology and the behavior of tumors. Most of the pathologists use classifications of renal tumors based on cytomorphologic and genetic characteristics. According to the Heidelberg classification (J Pathol. 1997; 183: 131-3) and the 1997 workshop held in Rochester, Minnesota, USA (Cancer 1997; 80: 987-9) the classification of renal cell tumors is based on these characteristics. The benign tumors are papillary adenoma (must have < 5mm in greatest diameter), oncocytoma and metanephric adenoma and the malignant tumors are conventional (clear cell) renal carcinoma, papillary renal carcinoma, chromophobe renal carcinoma, collecting duct carcinoma and unclassified cell carcinoma. Sarcomatoid carcinoma is not a particular tumor. Sarcomatoid change has been found to arise in all of the types of carcinoma in this classification, as well as in urothelial carcinoma of the renal pelvic mucosa.

The paper of this editorial comment is a timely study to make valuable this classification for the urologists. The authors studied the prognostic features among the several histologic subtypes of renal cell carcinoma. Patients with clear cell renal cell carcinoma had a poorer prognosis compared with patients with papillary and chromophobe renal cell carcinoma with no significant difference in cancer-specific survival between patients with papillary and chromophobe renal cell carcinoma. The paper also disclosed the need and importance for reporting tumor size, sarcomatoid component, grading and tumor necrosis. Tumor size, presence of a sarcomatoid component, and nuclear grade were significantly associated with death from clear cell, papillary, and chromophobe renal cell carcinoma. Histologic tumor necrosis was significantly associated with death from clear cell and chromophobe renal cell carcinoma, but not with death from papillary renal cell carcinoma.

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INVESTIGATIVE UROLOGY

Immune mechanisms in bacillus Calmette-Guerin immunotherapy for superficial bladder cancer

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J Urol. 2003; 170: 964-9

Purpose: Of all medical disciplines it is exclusively in urology in which immunotherapy for cancer has an established position today with intravesical bacillus Calmette-Guerin (BCG) against superficial bladder carcinoma recurrences. BCG is regarded as the most successful immunotherapy to date. However, the mode of action has not yet been fully elucidated. We provide a thorough overview of this complex field of research.

Materials and Methods: Rather than simply reporting all experimental data available for better understanding the involved immune mechanisms, we chose to provide comprehensively only information supported by several independent pathways of evidence.

Results: Major findings made during the last few years include systematic analyses of patient material, detailed in vitro studies and investigations in animal models, which have led to a substantially greater understanding of the mechanisms involved.

Conclusions: The efficacy of BCG is based on a complex and long lasting local immune activation. The bladder as a confined compartment, in which high local concentrations of the immunotherapy agent and effective recruitment of immune cells can be achieved, serves as an ideal target organ for this type of immunotherapy approach.

Editorial Comment

Intravesical BCG against superficial bladder carcinoma recurrences is regarded as the most successful immunotherapy to date. However, the mode of action has not been fully elucidated yet. Since the immuno-activating properties of BCG were discovered, investigations have been carried out to ascertain the functional mechanism. All investigations to date have shown that not one single functional mechanism, but a whole series of immunological phenomena are involved.

Doctors Boehle and Brandau, world leading researchers on BCG in superficial bladder carcinoma, present in this article the most recent knowledge on this form of immunotherapy. They describe the major findings made during the last few years when systematic analyses of patient material, detailed in vitro studies and investigations on animal models have led to a substantially greater understanding of the mechanisms involved. This review explains why BCG therapy is currently considered the most successful immunotherapy of solid tumors, and therefore, must be read by every urologist interested in bladder cancer.

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Racial differences in androgen receptor protein expression in men with clinically localized prostate cancer

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J Urol. 2003; 170: 990-3

Purpose: Black American men experience disproportionate mortality from prostate cancer (CaP) compared with white American men. Differences in outcome may stem from differences within the androgen axis. Since serum testosterone levels appear to be similar by race in men with CaP, we measured and compared androgen receptor (AR) protein expression in malignant and benign prostate tissue from black and white men who underwent radical prostatectomy for clinically localized CaP.

Materials and Methods: Archived radical prostatectomy specimens obtained from 25 white and 25 black men had AR protein antigen retrieved and immunostained. AR protein expression from CaP and benign tissue was assessed by 2 methods. Automated digital color video image analysis was used to measure the

percent area immunostained for AR protein and the intensity of expression (mean optical density). Visual scoring was performed to compare results with automated values.

Results: In black compared with white men malignant nuclei were 27% more likely to immunostain for AR ($p = 0.005$) and in immunopositive nuclei AR protein expression was 81% greater ($p = 0.002$). Visual scoring of malignant nuclei revealed that AR immunostaining was significantly increased in black vs white men (171 ± 40 vs 149 ± 37 , $p = 0.048$). In immunopositive benign nuclei AR protein expression was 22% greater in black than in white men ($p = 0.027$). Visual scoring of benign nuclei revealed 20% increased immunostaining in black vs white men, although this difference did not attain statistical significance ($p = 0.065$). Racial differences in AR protein expression were not explained by age, pathological grade or stage, although serum prostate specific antigen levels were higher in black men (9.7 ± 7.5 vs 15.5 ± 12.2 ng/ml, $p = 0.049$).

Conclusions: AR protein expression was 22% higher in the benign prostate and 81% higher in the CaP of black African compared with white men. CaP may occur at a younger age and progress more rapidly in black than in white men due to racial differences in androgenic stimulation of the prostate.

Editorial Comment

Although some controversies still exist, data on age adjusted deaths from CaP obtained from the Surveillance, Epidemiology, and End Results database from 1990 to 1998 in the USA revealed that Black American men have 2.3 times greater mortality from CaP than white American men. Previous works demonstrated that Black men are more frequently diagnosed with higher tumor volume, more advanced tumor stage, higher Gleason grade and higher prostate specific antigen (PSA) levels than white men are. The reasons for such findings are still not well understood.

This is the first study measuring and comparing androgen receptor (AR) protein expression in malignant and benign prostate tissue from black and white men who underwent radical prostatectomy for clinically localized CaP. The authors found that AR protein expression was 22% higher in the benign prostate and 81% higher in the CaP of black compared with white American men. Based on these findings, the authors speculated that CaP might occur at a younger age and progress more rapidly in black than in white men due to racial differences in androgenic stimulation of the prostate.

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RECONSTRUCTIVE UROLOGY

Gastrocystoplasty in patients with an areflexic low compliant bladder

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Eur Urol. 2003; 44: 260-5

Aim: This study was performed with the aim of evaluating gastrocystoplasty as a method of management of patients with an areflexic low compliant bladder.

Patients and Methods: We performed gastrocystoplasty in 30 patients (19 males and 11 females) with an areflexic low compliant bladder. The mean age of the patients was 23.4 ± 11 years (range 4-32). The etiology

of lower urinary tract dysfunction was myelodysplasia in 26 patients and spinal cord injury in 4. Twenty-three patients had normal renal function and 7 had impaired renal function (creatinine 2.0-5.0mg%). Additionally, 4 patients had an artificial urinary sphincter implanted and seven had an antireflux procedure performed.

Results: Renal function remained stable or improved in 29 patients. Postoperatively, there was a 225% increase from mean preoperative capacity and a 52% decrease from the preoperative end filling pressure. Nineteen patients voided spontaneously and 11 used clean intermittent catheterization to empty the bladder. Twenty-five patients were continent with augmentation alone, four with augmentation and artificial sphincter implantation while one remained incontinent, as sphincter implantation could not be performed due to the young age of the patient. Five patients (17%) had transient hematuria and dysuria after augmentation. There were no mortalities and complications included prolonged urinary leakage in one patient and mild gastric bleeding in another two.

Conclusion: The use of the stomach for augmenting the areflexic low compliant bladder is clearly advantageous over other tissues as it increases bladder capacity and compliance with consequent achievement of continence and preservation of upper tracts. An artificial urinary sphincter can be safely implanted in the same session. Because of its inherent fibromuscular properties, the gastric patch contributes to the force of urination resulting in better bladder emptying. Patients with impaired renal function are protected from hyperchloremic metabolic acidosis.

Editorial Comment

For a long time the areflexic low compliant urinary bladder with a dysfunctional urinary sphincter due to spinal cord trauma or congenital diseases such as myelodysplasia was treated with supravescical continent or incontinent urinary diversion. The rationale for treating patients with a supravescical diversion was to preserve renal function in the long term as well as to avoid further incontinence and its sequelae.

Ileal and colonic segments are mainly used to augment small capacity bladders with an intact sphincter. However, colo- or ileocystoplasty alone can rarely restore volitional voiding in truly neurogenic lower urinary dysfunction and may be contraindicated in patients with impaired renal function.

The authors of this paper tried to functionally restore the lower urinary tract in 30 young patients with myelodysplasia or spinal cord injury by using a pedicled gastric patch instead of an ileocolonic segment. It is remarkable that postoperatively 19/30 patients could void spontaneously with insignificant residual urine, incontinence was reduced to 1/30 patients with the help of an artificial urinary sphincter and deterioration of renal function occurred only in 1/30 patients.

Whether the good results obtained in this study are due to the better compliance, different innervation and a larger smooth muscle mass of gastric patches compared to lower intestinal segments is difficult to judge from such a small study. But it clearly shows that we successfully can and therefore should make every effort to restore function of the native lower urinary tract instead of simply doing a supravescical urinary diversion in patients with a long life expectancy knowing the long term complications and socioeconomic consequences of a stoma bag in these patients.

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Is there a role for bladder preserving strategies in the treatment of muscle-invasive bladder cancer?

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Eur Urol. 2003; 44: 57-64

Single modality bladder sparing therapy for muscle-invasive bladder cancer, including transurethral resection, systemic chemotherapy or radiotherapy have been demonstrated to result in insufficient local control of the primary tumor as well as decreased long-term survival of the patients when compared to radical cystectomy. Therefore, multimodality treatment protocols that aim at bladder preservation and involve all of the aforementioned approaches have been established. Arguments for combining systemic chemotherapy with radiation are to sensitize tumor tissue to radiotherapy and to eradicate occult metastases that have already developed in as many as 50% of patients at the time of first diagnosis. It has been shown that the clinical outcome observed with this approach approximates that after radical cystectomy. Additionally, a substantial number of patients survive with an intact bladder. However, bladder preserving approaches are costly, and require close co-operation between different clinical specialists as well as very close follow-up. The good long-term results obtained after cystectomy and creation of an orthotopic neobladder make the possible advantage of a bladder preservation strategy questionable in consideration of quality of life issues. Additionally, side effects related to bladder sparing therapy may result in an increased morbidity and mortality in those patients who in fact need to undergo surgery due to recurrent or progressive disease. Multimodality bladder sparing treatment is a therapeutic option that can be offered to the patient at centers that have a dedicated multidisciplinary team at their disposal. However, radical cystectomy remains the standard of care for muscle-invasive bladder tumors.

Editorial Comment

In the majority of cases bladder reconstruction is necessary after radical cystectomy due to bladder neoplasms. Despite the fact that the majority of both male and female patients with bladder cancer are nowadays eligible for an orthotopic bladder substitution the search for bladder preserving strategies thus avoiding any bladder reconstruction continues.

The review by Kuczyk et al. outlines the results of the more recent protocols of multimodality bladder preservation in locally advanced transitional cell cancer of the bladder. All studies lack a control group – cystectomy monotherapy – to which patients were randomly assigned. But in selected patients, 5-year survival rates with an intact bladder between 36 and 41 % was obtained. However, the multimodality strategies to achieve a complete long term response were complex, costly, cumbersome for patients and treating physicians, and required a certain infrastructure available usually only in large centers. Despite all the efforts some patients still required a salvage cystectomy, which tends to be technically more difficult and often does not allow features which might be important for the patients' future quality of life such as nerve preservation for potency, or an orthotopic neobladder with good results regarding continence. Another aspect are recurrent superficial tumors in the initially successfully treated preserved bladders which may be seen even beyond 5 years.

Surprisingly mortality in the multimodality therapy group was higher in some series than in contemporary radical cystectomy studies (up to 4 % due to chemotherapy vs. 1-2% due to perioperative mortality). A quality of life advantage in the bladder preserved patients has not been substantiated to date. In fact it may be difficult to prove in some series were patients suffer from reduced bladder capacity, severe urgency, and repeat surgery due to superficial tumor recurrences in the long term. Therefore one may conclude that cystectomy in combination with a refined technique of bladder reconstruction to date remains the best option to treat locally advanced bladder cancer. We should continue to search for ways to treat these with

bladder preserving strategies, however, only under strict protocols and only in large centers with good interdisciplinary cooperation.

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UROLOGICAL ONCOLOGY

Practical considerations in permanent brachytherapy for localized adenocarcinoma of the prostate

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Urol Clin North Am. 2003; 30: 351-62

Prostate brachytherapy has become an accepted treatment modality for localized prostate cancer. Long-term biochemical and biopsy data confirm the early positive impressions that brachytherapy is as valid a treatment option as radical prostatectomy or EBRT. Quality-of-life data also look promising, but more follow-up data are needed. Is brachytherapy as good as or perhaps better than radical prostatectomy? This question cannot be answered yet. Well-controlled, randomized studies are needed. In the meantime, the clinician will have to rely on the available published data.

Permanent interstitial brachytherapy for the management of carcinoma of the prostate gland

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J Urol. 2003; 169: 1643-1652

Purpose: We summarize the permanent prostate brachytherapy literature, including biochemical outcomes, quality of life parameters and areas of controversy.

Materials and Methods: The permanent prostate brachytherapy literature was reviewed using Medline searches to ensure completeness.

Results: Using various planning and intraoperative techniques the majority of the brachytherapy literature demonstrates durable biochemical outcomes for patients with low, intermediate and high risk features. For low risk patients there is no advantage to combining supplemental external beam radiation therapy with brachytherapy. In addition, supplemental external beam radiation therapy may not improve biochemical outcomes for patients at intermediate and high risk if the target volume consists of the prostate with a generous periprostatic margin. There is no defined role for adjuvant hormonal manipulation. Although a reliable set of pretreatment criteria to predict implant related morbidity is not available, severe urinary and rectal morbidity is rare. The incidence of brachytherapy induced erectile dysfunction is significantly greater than initially reported but the majority of patients respond favorably to sildenafil.

Conclusions: Continued refinements in brachytherapy planning and implementation techniques, postimplantation evaluation and continued elucidation of the etiology of urinary, bowel and sexual dysfunction should result in further improvements in biochemical and quality of life outcomes.

Editorial Comment

These two papers essentially cover all available knowledge on the clinical application on permanent interstitial seed brachytherapy for prostate cancer.

Next to radical prostatectomy, permanent interstitial prostate (low-dose-rate, LDR) brachytherapy has become an accepted modality for treating localized prostate cancer. These papers are very thorough and up-to-date overviews on the history, the technical aspects, the treatment results and side effects of this new therapeutic option. Based on previous ultrasound inventions in Europe, the technique was refined basically in the US and realized on biplanar linear array ultrasound probes. This tool, together with an expert technique, forms the basis of a successful brachytherapy. Furthermore, software advances for the preplanning and the procedure resulted in new programs that now can accurately monitor each seeds position and radiation contribution.

Patient selection is crucial for successful therapy and the ideal candidate has low risk prostate cancer, defined as PSA of 10 or less, Gleason score of 6 or less and clinical stage T2a or less. Patients who present with more advanced features will require additional therapy, which is also addressed in depth in the articles.

The important aspect of doses is also focussed in detail. Generally, a dose of 140 Gy can be considered as threshold, as doses of less than 140 Gy had inferior results. Doses of 140 Gy and higher had outcomes comparable to radical prostatectomies.

The treatment results of studies all over the world are given for low risk patients, and also for patients with high-risk cancer. Low risk patients treated with brachytherapy have treatment results comparable to radical prostatectomy results. High-risk patients if treated in combination with hormones and/or external radiation therapy do fairly well with still room for improvement.

Treatment morbidity and side effects are also given in detail and are clearly inferior to radical prostatectomy results. Urinary retention rates vary between 1.5 to 34%, whereas late urinary complications including stricture, incontinence, and proctitis are very rare, given the right dose and technique.

An important aspect is the results on erectile dysfunction. Here, brachytherapy clearly has an advantage over radical prostatectomy, with potency preservation rates in the seventies to nineties, if brachytherapy is given alone. These data still can be improved by edition of files.

In summary, permanent interstitial prostate cancer brachytherapy has become an accepted treatment modality for localized prostate cancer. Therapeutic validity is high and side effects are very low as compared to other curative alternatives. Therefore this technique will represent a clear option in the armamentarium of the urologic surgeon.

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FEMALE UROLOGY

Effective treatment for mixed urinary incontinence with a pubovaginal sling

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J Urol. 2003; 170 (2 Pt 1): 494-7

Purpose: We assessed the results of autologous fascia pubovaginal sling (PVS) in women with mixed incontinence using a validated outcome score and identified risk factors for failure.

Materials and Methods: A total of 131 women who received a PVS for sphincteric incontinence (SUI) confirmed by history, physical examination and/or videourodynamic study (VUDS) were identified from a database during the accrual dates 1995 to 2001. Patients with a urethral diverticulum, neoplasm or urinary fistula were excluded. Patients with SUI who also complained of urinary urge incontinence (UII) and/or had detrusor instability that reproduced incontinence symptoms during VUDS were diagnosed with mixed incontinence (MUI). Patients completed a urological questionnaire, 24-hour voiding diary, pad test, VUDS and cystoscopy preoperatively. The diagnosis of SUI and UII was further confirmed by physician interview. In patients with MUI detrusor overactivity was classified according to urodynamic criteria. At least 1 year postoperatively the validated Urinary Incontinence Outcome Score (UIOS) was calculated from a 24-hour diary, pad test and questionnaire, and outcomes in patients with SUI and those with MUI were compared. The study was powered a priori to detect a 20% difference in outcome score. Cured patients (UIOS 0) were compared with those who were not cured (UIOS 1 or greater) and univariate analysis was applied to identify the correlates of failed PVS.

Results: Of the 131 patients evaluated 33 with a diverticulum or fistula were excluded and 98 underwent PVS. Patient age was 45 to 84 years (median 66). Followup was 1 to 7 years (median 3). A total of 46 patients (48.5%) had simple SUI and 52 (51.5%) had MUI. Two patients were lost to followup (2%) and the procedure was presumed to have failed. There were no differences in age, hormone status, previous surgery or pelvic organ prolapse between patients with SUI and MUI. The cure/improved rate was 97% in 44 SUI cases and 93% in 47 MUI cases, which was a nonsignificant difference ($p = 0.33$). Analysis of the MUI group showed that patients who were cured and not cured had similar age, parity, urethral angle, bladder capacity, leak point pressure and pad tests. Patients with MUI who were cured had a higher number of voids in 24 hours on preoperative voiding diary (12 vs 8, $p = 0.01$), while those who were improved or in whom treatment failed had a greater number of urgency (5.6 vs 4.1, $p < 0.05$) and UII (5.1 vs 3.0, $p < 0.01$) episodes. Univariate analysis of MUI cases showed that an increasing number of preoperative urgency and urge incontinence episodes correlated directly with PVS failure ($r = 0.33$, $p = 0.038$ and $r = 0.35$, $p = 0.048$, respectively). In contrast, an increasing number of voids correlated with successful PVS ($r = 0.4$, $p = 0.01$).

Conclusions: Women with SUI and concurrent urge incontinence or detrusor instability have a successful PVS outcome at a rate comparable to that in women with simple SUI, in contrast to our previous findings. Increasing episodes of urgency and urge incontinence on the preoperative voiding diary correlated directly with surgical failure, while voiding frequently was associated with cure.

Editorial Comment

The authors review 131 patients who underwent an autologous rectus fascial pubovaginal sling performed by the same surgeon. Pre-operatively, the patients completed a urologic questionnaire, 24 hour voiding diary, pad test, video urodynamics and cystoscopy. One year postoperatively the patients completed a 24 hour voiding diary, pad test, questionnaire and physical examination with a full bladder. In addition, they completed a validated urinary incontinence outcome score (UIOS) (1). The treatment outcome in patients with the preoperative diagnosis of stress urinary incontinence was compared to the outcome in patients with preoperatively diagnosed mixed urinary incontinence.

This is a very elegant and well written paper. It offers multiple points to ponder for those surgeons treating urinary incontinence. The data the paper presents is very fair, unbiased and clear. The use of the Urinary Incontinence Outcome Score draws very firm lines between what is considered a cure, improved, and a failure (1). I use this outcome score as well when analyzing data and urge the reader to consider using it in his practice. One of the true highlights of this paper is in the discussion section, especially reviewing the outcome

data presented and pondering whether a selection bias may have been found in the authors of this paper in view of their impressive previous research into this population group. The caveats they extend to the reader for the use of a pubovaginal sling with mixed urinary incontinence should be strongly reviewed and considered.

Reference

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Preoperative urodynamic evaluation may predict voiding dysfunction in women undergoing pubovaginal sling

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J Urol. 2003; 169: 2234-7

Purpose: We determine which urodynamic parameters can best predict postoperative voiding dysfunction following pubovaginal sling surgery.

Materials and Methods: The records of 98 consecutive women who had undergone pubovaginal sling surgery with allograft fascia lata between July 1998 and July 2000 were reviewed. Urodynamic and follow-up data were sufficient for evaluation for 73 patients. Urodynamic and clinical parameters were correlated with urinary retention, time to return of efficient voiding and development of post-operative urgency symptoms.

Results: Average time to return of efficient voiding was 3.92 days (median 3). Of 21 women who voided without a detrusor contraction, urinary retention developed in 4 (23%) versus 0 of 48 who voided with detrusor contraction ($p = 0.007$). Urinary retention was defined as the need to perform even occasional self-catheterization. All 4 women with urinary retention had a detrusor pressure of greater than 12 cm H₂O (0 in 3, 4 in 1). None of the women with a detrusor pressure of greater than 12 cm H₂O had urinary retention ($p = 0.047$). The presence of Valsalva voiding in women without detrusor contraction did not affect the incidence of urinary retention (11.1%) compared to those who did not demonstrate Valsalva voiding (5.1%) ($p = 0.603$). Peak flow rate, detrusor instability on preoperative urodynamics and post-void residual urine volume were not associated with postoperative urinary retention. Finally, post-void residual urine volume predicted delayed return to normal voiding ($p = 0.001$). There were no other urodynamic parameters that were significantly associated with urinary retention, delayed return to normal voiding or postoperative urgency symptoms including peak flow rate, capacity or compliance.

Conclusions: Women who void without or with a weak detrusor contraction are most likely to have urinary retention postoperatively. Therefore, we conclude that preoperative urodynamic evaluation may be used to counsel women regarding the risk of urinary retention following the pubovaginal sling procedure.

Editorial Comment

The authors review the urodynamic parameters and follow-up data on 73 patients who had undergone pubovaginal sling with allograft fascia lata. They characterized post-operative dysfunctional voiding patterns as urinary retention, delayed return to normal voiding and de novo urgency. The urodynamic patterns analyzed

to define post-operative dysfunctional voiding patterns included detrusor voiding pressure at maximum flow rate, detrusor instability, peak flow rate, post-void residual, cystometric bladder capacity and bladder compliance. Out of the 73 post-operative women reviewed, 4 women were in urinary retention and 9 different women took greater than 7 days to resume their post-operative voiding. The 4 women in urinary retention all voided without a detrusor contraction. One of those women voided with Valsalva maneuvers while the other three in urinary retention voided without a Valsalva maneuver. Of the 7 women who were noted to void by Valsalva maneuver, one had a delayed return to efficient voiding. Three patients developed de novo urgency and one of the three had detrusor instability on pre-operative urodynamics while two did not.

This paper is quite notable with regard to emphasizing the importance of pre-operative urodynamic evaluation prior to an anti-incontinence procedure and to commenting on the post-operative voiding function of Valsalva voiders. Many times with a physical examination and history consistent with stress urinary incontinence, surgeons will question the need to put patients through a urodynamic testing. The value of a urodynamic testing denoted by this article would include characterizing the woman's voiding pattern with regards to the use of a detrusor contraction or not, in addition to documenting detrusor instability. Preparation for potential post-operative difficulties is of immeasurable value in the field of voiding dysfunction. However, as stated by this paper, most women who void without a detrusor contraction will not have urinary retention after an anti-incontinence operation such as a sling. Perhaps these patients do normally void with a detrusor contraction but that the urodynamic study was unable to identify or characterize same thus obscuring the true voiding difficulties of patients who void without a detrusor contraction and who undergo a suburethral sling.

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PEDIATRIC UROLOGY

Antibiotics and surgery for vesicoureteric reflux: a meta-analysis of randomised controlled trials

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Arch Dis Child. 2003; 88: 688-94

Aims: To evaluate the benefits and harms of treatments for vesicoureteric reflux in children.

Methods: Meta-analyses of randomised controlled trials using a random effects model. Main outcome measures were incidence of urinary tract infection (UTI), new or progressive renal damage, renal growth, hypertension, and glomerular filtration rate.

Results: Eight trials involving 859 evaluable children comparing long term antibiotics with surgical correction of reflux (VUR) and antibiotics (seven trials) and antibiotics compared with no treatment (one trial) were identified. Risk of UTI by 1-2 and 5 years was not significantly different between surgical and medical groups (relative risk (RR) by 2 years 1.07; 95% confidence interval (CI) 0.55 to 2.09, RR by 5 years 0.99; 95% CI 0.79 to 1.26). Combined treatment resulted in a 60% reduction in febrile UTI by 5 years (RR 0.43; 95% CI 0.27 to 0.70) but no concomitant significant reduction in risk of new or progressive renal damage at 5 years (RR 1.05; 95% CI 0.85 to 1.29). In one small study no significant differences in risk for UTI or renal damage were found between antibiotic prophylaxis and no treatment.

Conclusion: It is uncertain whether the identification and treatment of children with VUR confers clinically important benefit. The additional benefit of surgery over antibiotics alone is small at best. Assuming a UTI rate of 20% for children with VUR on antibiotics for five years, nine reimplantations would be required to prevent one febrile UTI, with no reduction in the number of children developing any UTI or renal damage.

Editorial Comment

This paper reviews randomized controlled trials of children with vesicoureteral reflux. Only eight trials were felt to be adequate for analysis. Nonetheless, the conclusion that the authors reach is that there are few differences in the results of antibiotic treatment vs. surgical treatment. Indeed, the only difference demonstrated was a 60% reduction in febrile UTI at 5 years. The authors calculate that 9 to 17 children would require antireflux surgery to prevent one UTI during the five-year follow-up. If indeed there is limited benefit, the authors intimate that even voiding cystourethrograms (VCUG) may not be needed. All children could be treated with antibiotics. Furthermore, the only study that reviews the results of no antibiotic treatment for patients with reflux showed no significant differences between groups. If this data holds up, it is conceivable that no VCUG would be needed in these children and no antibiotics would be necessary except for treatment of acute UTI.

On the other hand, the paper also documents the weaknesses in those trials. The studies all have significant problems. Even accounting for the weaknesses of the studies of medical vs. surgical management, it is likely that longer follow-up would show an even larger difference in febrile UTIs. Similarly, longer follow-up might well show benefits of antibiotic use in children with reflux, as the single study reported had only 29 children and 14 months of follow-up. It seems that the main point of this manuscript is that more studies are needed to obtain scientific data that enable optimal decision-making.

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Treatment of vesico-ureteric reflux: a new algorithm based on parental preference

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Objective: To assess parental preference (acknowledged in treatment guidelines as important when choosing therapy) about treatments for vesico-ureteric reflux (VUR, commonly associated with urinary tract infection and which can cause long-term renal damage if left untreated), as at present there is no definitive treatment for VUR of moderate severity (grade III).

Subjects and Methods: The parents of 100 children with grade III reflux (38 boys and 62 girls, mean age 4 years, range 1-15) were provided with detailed information about the three treatment options available for treating VUR (antibiotic prophylaxis, open surgery and endoscopic treatment), including the mode of action, cure rate and possible complications, and the practical advantages and disadvantages. They were then presented with a questionnaire asking them to choose their preferred treatment.

Results: Most parents preferred endoscopic treatment (80%), rather than antibiotic prophylaxis (5%) or open surgery (2%); 13% could not decide among the three options and endoscopic treatment was recommended.

Conclusion: Given the strong preference for endoscopic treatment we propose a new algorithm for treating VUR; endoscopic treatment would be considered as the first option for persistent VUR, except in severe cases where open surgery would still be recommended.

Editorial Comment

The authors examine parental preferences in choices of treatment for vesicoureteral reflux. Using 100 families of children with Grade III/V reflux as a test group, the authors presented information on 3 treatment options (antimicrobial therapy, open surgery and endoscopic injection). 80% chose endoscopic therapy vs. only 2% for open surgery and 5% for antimicrobial therapy!

The parental choices in this case are striking. On the other hand, the choices are based primarily on the counseling. In particular, the account of open surgery described a hospitalization of 7-10 days and a follow-up voiding cistourethrogram (VCUG). In our hospital, the majority of patients go home the next day after antireflux surgery and VCUG are only done if patients have persistent hydronephrosis or UTI. This difference in practice may make an enormous difference in parental choice. Nonetheless, it is important to recognize the emotional appeal of endoscopic therapy.

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