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UROLOGICAL SURVEY

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STONE DISEASE

The Learning Curve in the Training of Percutaneous Nephrolithotomy

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Objectives: To investigate the learning curve in the training of percutaneous nephrolithotomy (PCNL).
Methods: A total of 104 PCNL cases were included in this evaluation to define the learning curve of a surgeon with no previous experience at performing solo PCNL. Two parameters of expertise were reviewed, namely the operation and fluoroscopic screening times. The operation time was calculated as the beginning of access with the needle until the nephrostomy tube was placed and secured. PCNL procedures were analyzed in seven sets of 15 cases regarding the operation and fluoroscopy times, stone size, stone clearance rate, blood transfusion rate, and estimated blood loss.
Results: The mean operation time was 2.4 h for the first 15 patients. It decreased to a mean of 1.5 h for cases 46 through 60. No further decrease in the operation time was observed after case 60. The fluoroscopic screening time was a peak of 17.5 min in the first 15 cases, whereas it dropped to a mean of 8.9 min for cases 46 through 60. The decline in the mean fluoroscopy screening time continued in cases 61 to 104, but the decline was not significant. There was no significant difference in stone size, stone clearance rate, blood transfusion rate, and estimated blood loss among each set of cases.
Conclusions: This study suggests that the surgical competence in PCNL can be reached after 60 cases. PCNL and fluoroscopy times drop to a steady-state level after performing 60 procedures.

Editorial Comment

It is important first to note that this study reflects the learning curve for only one surgeon, and one would anticipate a range of learning curves dependent on prior experience with other procedures that require the Seldinger technique and fluoroscopic guidance and certainly innate skills might play a role. If safety is the primary outcome, then the transfusion rate suggests that after 15 cases, competency is achieved. If efficiency is the primary outcome, then the fluoroscopic time and operative time suggests that after 60 cases, competency is achieved. However, if stone-free results are the bar to judge competency, it appears that more experience is needed. The authors report only a 75% stone-free rate, though a liberal definition of 3 mm residual fragments or less was utilized. In addition, one should note that though 17% of patients had staghorn calculi and more had upper calyceal stones, only 4% of patients had an upper calyceal puncture. Defining the learning curve for an intercostal puncture may require another study!

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Antegrade Pyelography versus Unenhanced Multidetector CT in the Assessment of Urinary-Tract Stones after Percutaneous Nephrostomy Insertion: A Prospective Blinded Study

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Background and Purpose: In patients with a percutaneous nephrostomy tube (PCN) inserted for symptomatic stone disease, antegrade pyelography is an accepted modality to assess the collecting system and residual stone status prior to PCN removal. Recently, unenhanced multidetector CT (UMDCT) has shown its superiority for the assessment of urinary-tract stones. Comparison of UMDCT with antegrade pyelography has never been done; hence, our aim was to compare the two methods for the assessment of urinary stones in patients with a PCN.

Patients and Methods: Between July 2004 and July 2005, we prospectively imaged 49 consecutive patients with known urinary-tract stone disease who had PCN (27 men and 22 women; average age 57 +/- 20 years; range 4-88 years). All patients underwent UMDCT and antegrade pyelography within 24 hours. Both examinations were prospectively and blindly evaluated by two attending radiologists for the presence, location, and size of urinary-tract stones.

Results: According to the findings of both imaging modalities, 18 patients were stone free, and 31 patients had urinary stones. In 20 of the latter 31 patients (64.5%), the urinary stones were diagnosed only by UMDCT. Antegrade pyelography missed renal as well as ureteral stones, with a significant mean size (5.1 x 6.2 mm, and 6 x 5.3 mm, respectively). Antegrade pyelography missed radiolucent (8/20) as well as radiopaque (12/20) stones. In 11 of the 31 patients (35.5%), urinary stones were diagnosed by both UMDCT and antegrade pyelography. The average size of these renal stones was 6 x 11 mm, and the mean ureteral stone size was 11 x 13 mm. In 64% (7/11), the stones were radiolucent and in 36% (4/11) radiopaque. There was no patient in whom urinary stones were diagnosed by antegrade pyelography but missed by UMDCT.

Conclusions: Unenhanced multidetector CT is more accurate than antegrade pyelography via a PCN for the assessment of urinary-tract stones, with the advantage of reducing the risks of contrast injection side effects.

Editorial Comment

Resolution of stones on antegrade nephrostogram may be dependent on the patient's body mass index and the density of the stone composition. It would be helpful to re-evaluate the relative accuracy of antegrade nephrostogram stratified by these two parameters – one might hypothesize that the Hounsfield units on the CT prior to placement of the percutaneous nephrostomy tube might predict whether reimaging with antegrade nephrostogram would be useful. Similarly, stone location may be an important variable – stones in the ureter or in the pelvis close to the retention coil may be more difficult to discern on CT compared to calyceal stones.

It is important to note that the antegrade nephrostogram performed in this study utilized fluoroscopy. Antegrade nephrostograms that incorporate tomograms prior to instillation of contrast might have a higher sensitivity for stone detection. Though the authors state that sensitivity of a stone-protocol CT scan is 100% with a nephrostomy tube in place, they did not repeat the CT scan after nephrostomy tube removal in those patients thought to be stone-free. It is possible that some stones were "masked" by the presence of the nephrostomy tube.

It is important to note that antegrade nephrostogram will at times be an important post-operative study, specifically if one is evaluating for urinary extravasation, adequate positioning of the nephrostomy tube, residual ureteral obstruction unrelated to calculus, or adequacy of access for a second-look procedure.

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ENDOUROLOGY & LAPAROSCOPY

Complications of Laparoscopic Surgery for Urological Cancer: A Single Institution Analysis

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Purpose: We determined the incidence of and risk factors for perioperative complications associated with laparoscopic oncological surgery for urological malignancy.
Materials and Methods: All records of patients undergoing laparoscopic surgery for urological malignancy at a tertiary care institution from April 1997 through January 2006 were reviewed. Relevant demographic and perioperative data during and within 6 weeks of surgery were evaluated retrospectively. Various factors were analyzed to estimate risk of a perioperative complication such as the Charlson Comorbidity Index, American Society of Anesthesiologists score, European Scoring System for laparoscopic urological operations and surgeon experience. Logistic regression was used to identify independent risk factors for perioperative complications.
Results: A total of 1,867 laparoscopic oncological surgeries were performed, including radical or partial nephrectomy, nephroureterectomy, radical prostatectomy and radical cystectomy. Perioperative complications occurred in 12.4% of patients, including 3.5% intraoperatively and 8.9% postoperatively. Intraoperative (2.3%) and postoperative hemorrhage (2.7%) accounted for 40% of all perioperative complications. All cause perioperative mortality occurred in 8 patients (0.4%). On multivariate analysis radical cystectomy (adjusted OR 4.9, $p < 0.001$), partial nephrectomy (adjusted OR 2.4, $p < 0.001$), length of surgery greater than 4 hours (adjusted OR 2.5, $p < 0.001$) and preoperative serum creatinine greater than 1.5 mg/dL (adjusted OR 2.1, $p = 0.04$) were independent risk factors for perioperative complications. Comparing the periods of 1997 to 2000 vs. 2001 to 2005, despite a significant increase in technical complexity of procedures (European Scoring System 9.8 vs. 60.6, $p < 0.001$), the incidence of complications tended to decrease (17.3% vs. 12.5%, $p = 0.3$).
Conclusions: In appropriately selected patients laparoscopic urological oncological surgery is safe. These data on perioperative complications could possibly serve as a reference benchmark for practicing urologists.

Editorial Comment

Since the first laparoscopic surgery in urology was performed in 1990, questions about the efficiency and safety of this minimally invasive technique have been challenged, particularly in the urological oncologic field. The strength of this manuscript is the large experience with complex oncological procedures performed laparoscopically in a single institution. The complication rates are comparable to open technique even when the complexity of the cases increased. The authors should be congratulated for the improvement of minimally invasive surgery in Urological oncology benefiting patients with good clinical outcome.

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Imperative Indications for Conservative Management of Upper Tract Transitional Cell Carcinoma

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Purpose: We report our experience with patients with imperative indications for endoscopic treatment for upper tract transitional cell carcinoma.
Materials and Methods: Between 1983 and 2004 we identified 37 patients with a solitary kidney, bilateral disease or preoperative creatinine greater than 2.0 mg/dL who underwent endoscopic treatment for localized upper tract transitional cell carcinoma. A retrospective chart review was performed.
Results: Of the 37 patients 32 had a solitary kidney, 3 had bilateral disease and 2 had preoperative creatinine greater than 2.0 mg/dL. Median age at diagnosis was 75 years (range 56 to 88). Bladder cytology was positive or atypical in 15 of 31 patients (48%). Tumors were grade 1 to 3 in 2, 13 and 7 patients, respectively, and diagnosed visually in 15. At a median followup of 2.7 years for survivors 23 patients (62%) had a total of 56 upper tract transitional cell carcinoma recurrences. Grade and stage progression occurred in 3 and 3 patients, respectively. Ten of the 23 patients who experienced upper tract recurrence died of transitional cell carcinoma. Overall kidney preservation was achieved in 24 of the 32 patients (75%) with a solitary kidney. At last followup 24 patients had died, including 11 (29.7%) of transitional cell carcinoma, at a median of 2.9 years. Cancer specific survival at 5 years for this cohort was 49.3%.
Conclusions: Our results indicate that upper tract tumor recurrence occurs in a majority of patients with imperative indications for endoscopic treatment, underscoring the need for frequent surveillance. While most kidneys can be preserved, cancer specific death is common.

Editorial Comment

Transitional Cell Carcinoma (TCC) of the Upper Tract is one of the most challenges diseases, especially when involves solitary kidneys. The development of digital imaging may have improved the diagnosis of the TCC in the upper tract, as well as, the treatment of small burden disease with laser technology. The treatment of adjuvant intra-collecting system therapy with BCG or other agents was not expanded in this article due to the small number of patients. It will be helpful to establish a multi-center trial to define the role of conservative endoscopic therapy with adjuvant intra-collecting system chemotherapy agents for upper tract TCC.

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IMAGING

Comparison of Effective Radiation Doses in Patients Undergoing Unenhanced MDCT and Excretory Urography for Acute Flank Pain

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Objective: The purpose of this study was to measure and compare the effective radiation dose in patients undergoing unenhanced MDCT and excretory urography for acute flank pain, and to explore technical and practical factors affecting the effective dose.
Subjects and Methods: One hundred nineteen patients with acute flank pain were included. All patients were examined using both MDCT and excretory urography. CT involved one acquisition from the upper kidney margin to the symphysis pubis. The only protocol variation was in the tube current (mAs), which was made according to patient body mass. The excretory urography protocol consisted of three images, with more when supplementary images were needed. Effective radiation doses were computer-simulated using dosimetry programs for CT and conventional radiography, based on Norwegian Radiological Protection Board dose data sets. Mean and SDs of measured patient doses were calculated and compared. Further analyses of dose variations in body mass categories (body mass index) were conducted, as were analyses concerning the number of images taken.
Results: The mean effective doses were 7.7 mSv with MDCT and 3.63 mSv with excretory urography. The effective dose varied both in and between techniques but could be predicted. Radiation risk decreased significantly with increased patient weight. Conclusion: The average effective dose with MDCT was more than double that with excretory urography. However, the appropriate dose could be strongly predicted by the patient's body mass index and by procedure. An optimum low-dose protocol should be considered before initiating unenhanced MDCT for ureteral colic in order to minimize the radiation-induced cancer risk and to secure adequate image quality.

Editorial Comment

In many institutions, nonenhanced computed tomography has largely supplanted intravenous urography as the primary modality for evaluation of patients suspected of having urolithiasis. As we know, nonenhanced multidetector CT (MDCT) examination, on average, doubled the effective radiation dose to the patient when compared with intravenous urography (if a total of 5 films are obtained). This is particularly important to the young female patients due the direct radiation exposure to the gonads. Some young female patients might present with chronic episodes of urolithiasis, and therefore will be submitted to multiple radiologic examinations during their lifetime The aim of this study was to use commercially available software to evaluate effective radiation doses between different radiologic examination procedures and to explore the relationship between technical and practical factors that could affect the effective radiation dose, both during and between the chosen imaging procedures.

The authors presents an interesting observation; they found that a significantly wide dose range of effective doses with both MDCT and excretory urography, mainly influenced by body size (BMI). Patients of normal weight were exposed to a significantly higher radiation risk with MDCT than with excretory urography when compared with the other weight categories. The mAs with both excretory urography and CT varied considerably according to BMI. With excretory urography, an exponential variation in BMI might be expected from the automatic exposure control system (photo timing). However, with MDCT, the mAs varied as a consequence of subjective considerations. This was possibly caused by operator attempts to avoid an increased noise level for patients with high BMI. Recently, several studies has been show that low-dose MDCT protocols, which delivers radiation dose comparable to those of excretory urography are appropriate for the diagnosis of ureteral stones, and that it provides excellent intraobserver and interobserver agreement and does not obscure alternative diagnosis. Nowadays it is imperative to adapt technical parameters of MDCT on the basis of clinical indication. It is not acceptable to use protocols based on subjective considerations and thus delivering increased radiation risk for patients of normal weight. Based on the authors' conclusion we should keep in mind that BMI should also be taken into consideration because it is too a risk predictor. As a rule, unenhanced optimized low-

dose CT should be used routinely in clinical practice and we must pursue in the development of optimized low-dose MDCT protocols.

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The Utility of Magnetic Resonance Imaging and Spectroscopy for Predicting Insignificant Prostate Cancer: an Initial Analysis

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Objective: To design new models that combine clinical variables and biopsy data with magnetic resonance imaging (MRI) and MR spectroscopic imaging (MRSI) data, and assess their value in predicting the probability of insignificant prostate cancer.
Patients and Methods: In all, 220 patients (cT stage T1c or T2a, prostate-specific antigen level < 20 ng/mL, biopsy Gleason score 6) had MRI/MRSI before surgery and met the inclusion criteria for the study. The probability of insignificant cancer was recorded retrospectively and separately for MRI and combined MRI/MRSI on a 0-3 scale (0, definitely insignificant; - 3, definitely significant). Insignificant cancer was defined from surgical pathology as organ-confined cancer of </= 0.5 cm (3) with no poorly differentiated elements. The accuracy of predicting insignificant prostate cancer was assessed using areas under receiver operating characteristic curves (AUCs), for previously reported clinical models and for newly generated MR models combining clinical variables, and biopsy data with MRI data (MRI model) and MRI/MRSI data (MRI/MRSI model).
Results: At pathology, 41% of patients had insignificant cancer; both MRI (AUC 0.803) and MRI/MRSI (AUC 0.854) models incorporating clinical, biopsy and MR data performed significantly better than the basic (AUC 0.574) and more comprehensive medium (AUC 0.726) clinical models. The P values for the differences between the models were: base vs. medium model, < 0.001; base vs. MRI model, < 0.001; base vs. MRI/MRSI model, < 0.001; medium vs. MRI model, < 0.018; medium vs. MRI/MRSI model, < 0.001.
Conclusions: The new MRI and MRI/MRSI models performed better than the clinical models for predicting the probability of insignificant prostate cancer. After appropriate validation, the new MRI and MRI/MRSI models might help in counseling patients who are considering choosing deferred therapy.

Editorial Comment

Insignificant prostate cancer defined as pathologically organ-confined cancer with a total volume of ≤ 0.5 cm 3 and no poorly differentiated component (Gleason grade 4 or 5) on histology is not infrequent but patients with this cancer are very difficult to identify clinically. The authors presented their pioneering work emphasizing that after appropriate validation this new magnetic resonance imaging (MRI) and MRI / magnetic resonance spectroscopic imaging (MRSI) models, might improve the overall accuracy of clinical models in predicting the likelihood of insignificant prostate cancer .Information obtained with conventional MRI and with magnetic resonance spectroscopic imaging were combined with clinical variables and biopsy results in order to build this new clinical nomogram. Both MRI models and the MRI/MRSI model were more accurate than the

clinical models for discriminating insignificant prostate cancer from significant prostate cancer. Since MRSI is more specific than conventional MRI for identification of prostate cancer, one could expect that the MRI/MRSI model was the most discriminating (area under the curve 0.854) and performed significantly better than MRI model alone and other clinical models. As pointed out by the authors the major limitation of the model is that they are vulnerable to upgrading of the biopsy Gleason grade after radical prostatectomy; 26% of the patients of this series had their Gleason scores upgraded. This was particularly important in 7% of the patients of this series. The authors emphasizes that their goal was not produce MRI models ready for clinical use, but rather to test the feasibility of creating such models. In our institution, we already started a prospective clinical study in order to validate this MRI/MRSI model.

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UROGENITAL TRAUMA

Blunt Renal Trauma: Comparison of Contrast-Enhanced CT and Angiographic Findings and the Usefulness of Transcatheter Arterial Embolization

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Background: The purpose of this study was to evaluate the role of contrast-enhanced CT and the usefulness of superselective embolization therapy in the management of arterial damage in patients with severe blunt renal trauma.
Patients and Methods: Nine cases of severe renal trauma were evaluated. In all cases, we compared contrast-enhanced CT findings with angiographic findings, and performed transcatheter arterial embolization (TAE) in six of them with microcoils and gelatin sponge particles. Morphological changes in the kidney and site of infarction after TAE were evaluated on follow-up CT Chronological changes in blood biochemistry findings after injury, degree of anemia and renal function were investigated. Adverse effects or complications such as duration of hematuria, fever, abdominal pain, renovascular hypertension and abscess formation were also evaluated.
Results: The CT finding of extravasation was a reliable sign of active bleeding and useful for determining the indication of TAE. In all cases, bleeding was effectively controlled with superselective embolization. There was minimal procedure-related loss of renal tissue. None of the patients developed abscess, hypertension or other complications.
Conclusions: In blunt renal injury, contrast-enhanced CT was useful for diagnosing arterial hemorrhage. Arterial bleeding may produce massive hematoma and TAE was a useful treatment for such cases. By using selective TAE for a bleeding artery, it was possible to minimize renal parenchymal damage, with complications of TAE rarely seen.

Editorial Comment

The use of transcatheeter arterial embolization is a useful tool when managing renal traumatic injuries. There are typically two situations where embolization is needed, in the acute setting bleed and in a delayed bleed (usually 10-14 days after initial injury). In the acute setting, on the arterial phase images of the CT there is a characteristic "blush" (as in splenic trauma), which suggests a significant arterial injury. While we speak of the retroperitoneum as a confined space that can hold up to 4 to 8 units of blood, the tamponade effect is typically applicable to significant venous bleeding and not arterial injuries. Most major trauma centers are lucky to have a skilled vascular and intervential radiologist who can perform a super selective branch of the renal artery embolization. In the delayed setting, bleeding usually occurs 7 to 14 days after the initial injury. It is at this time that the hematoma starts to lyse and thus releases the tamponade effect. It is also the time it usually takes for a pseudoaneurysm to occur. While AAST Grade V real injuries are life threatening arterial injuries that warrant exploration, all lesser degrees of renal injuries usually do not cause hemodynamic instability and can thus be managed expectantly. With lesser degree renal injuries, the cause for hypotension is typically from associated intra-abdominal injuries and not the kidney injury itself. The reasons for such hemodynamic stability is that fracture lines in the shattered kidney are typically radial in fashion and parallel to the interlobar arteries, and not through them. This is why the kidney can often seem to be broken into multiple pieces yet the parenchyma still be bright, with intravenous contrast on the nephrographic phase images. As to the infarcted parenchyma after embolization, when the segment of parenchyma is large (usually more than 25%) the patient will often have "post-infraction" spiking fevers and a white count for 2 to 3 days, which resolve spontaneously. I have had the same experience as the authors as to complications after embolization. I have not seen a single case of abscess or sustained hypertension. While episodes of transient hypertension are not uncommon, prolonged hypertension is exceedingly rare (less then 1% overall).

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Single Kidney and Sports Participation: Perception versus Reality

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Objectives: Physician opinions and practice patterns regarding the participation of children and adolescents with single, normal kidneys in contact/collision sports are widely varied. We hypothesize that limitation of participation from play based only on the presence of a single kidney is not supported by available data. We sought to determine recommendations of pediatric nephrologists regarding the participation of patients with single, normal kidneys in contact/collision sports and review the literature to determine the rate of sports-related kidney injury compared with other organs.
Methods: Members of the American Society of Pediatric Nephrology were surveyed regarding their recommendations for participation of patients with single, normal kidneys in contact/collision sports. Medical and sports literature databases were searched to determine sports-related kidney, brain, spinal cord, and cardiac injury rates and the sports associated with kidney injury.
Results: Sixty-two percent of respondents would not allow contact/collision sports participation. Eighty-six percent of respondents barred participation in American football, whereas only 5% barred cycling. Most cited

traumatic loss of function as the reason for discouraging participation. The literature search found an incidence of catastrophic sports-related kidney injury of 0.4 per 1 million children per year from all sports. Cycling was the most common cause of sports-related kidney injury causing > 3 times the kidney injuries as football. American football alone accounted for 0.9 to 5.3 fatal brain injuries and 4.9 to 7.3 irreversible spinal cord injuries per 1 million players per year. Commotio cordis causes 2.1 to 9.2 deaths per year.
Conclusions: Most pediatric nephrologists prohibit contact/collision sports participation by athletes with a single kidney, particularly football. The available evidence suggests that cycling is far more likely to cause kidney injury. In addition, kidney injury from sports is much less common than catastrophic brain, spinal cord, or cardiac injury. Restricting participation of patients with a single, normal kidney from contact/collision sports is unwarranted.

Editorial Comment

Recommendations for patients who have a solitary kidney and participation in organized sports and so-called alternative extreme sports is controversial. Admittedly, children are more likely than adults to sustain renal injury from blunt abdominal trauma due to kidney relative size and lack of peri-renal fat and lack of bone and rib ossification. In general, patients with two normal kidneys and injury to one kidney in an accident or sports related event, I typically tell these patients to limit their activity to non strenuous activities and no lifting greater then 20 pounds for 1 to 3 months (1 month for non contact sports and 3 months for contact sports, such as football). The recommendation of the American Academy of Pediatrics Committee on Sports Medicine and Fitness is that children with a solitary kidney should not play team contact sports. However, what is the true incidence of high-grade renal injuries broken down by type of sport?

Johnson et al. (1) noted that high-grade injuries and renal loss in children occurred as a result of motor vehicle accidents, pedestrian versus motor vehicle and falls. No kidneys were lost to contact sports. Sledding, skiing and rollerblading resulted in kidney loss. Brown et al. (2) noted that all high-grade renal injuries resulted from bicycle accidents and none from team sports. It appears, therefore, that activities like bicycling, motorcross, skiing and the like, entail much higher speed and momentum then contact sports. Thus the mechanism of injury is much more severe with such activities then with contact sports, and helps to explain why high-grade injuries are rare with team sports (such as soccer and football). In conclusion, we feel that recommendations about participation in team sports and a solitary kidney appear to be overly protective and need to be re-evaluated with a metanalysis. However, non-team sports such as sledding, skiing, biking, atving and motorcross are risky activities for the solitary kidney child.

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PATHOLOGY

Updated Nomogram to Predict Pathologic Stage of Prostate Cancer Given Prostate-Specific Antigen Level, Clinical Stage, and Biopsy Gleason Score (Partin Tables) Based on Cases from 2000 to 2005

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Objectives: To update the 2001 "Partin tables" with a contemporary patient cohort and revised variable categorization, correcting for the effects of stage migration.
Methods: We analyzed 5730 men treated with prostatectomy (without neoadjuvant therapy) between 2000 and 2005 at the Johns Hopkins Hospital. Average age was 57 years. Multivariable logistic regression was used to estimate the probability of organ-confined disease, extraprostatic extension, seminal vesicle involvement, or lymph node involvement. Predictor variables included preoperative prostate-specific antigen (PSA) level (0 to 2.5, 2.6 to 4.0, 4.1 to 6.0, 6.1 to 10.0, and greater than 10.0 ng/mL), clinical stage (T1c, T2a, and T2b/T2c), and biopsy Gleason score (5 to 6, 3 + 4 = 7, 4 + 3 = 7, or 8 to 10). Bootstrap resampling was used to generate 95% confidence intervals for predicted probabilities.
Results: Seventy-seven percent of patients had T1c, 76% had Gleason score 5 to 6, 80% had a PSA level between 2.5 and 10.0 ng/mL, and 73% had organ-confined disease. Nomograms were developed for the predicted probability of pathologically organ-confined disease, extraprostatic extension, seminal vesicle invasion, or lymph node involvement. The risk of non-organ-confined disease increased with increases in any individual prognostic factor. The dramatic decrease in clinical stage T2c compared with the patient series used in the previous models resulted in T2b and T2c being combined as a single predictor in the nomogram.
Conclusions: These updated "Partin tables" were generated to reflect trends in presentation and pathologic stage for men diagnosed with clinically localized prostate cancer at our institution. Clinicians and patients can use these nomograms to help make important decisions regarding management of prostate cancer.

Editorial Comment

It is worth noting in this updated nomogram that Gleason score 7 has been stratified to 3+4=7 and 4+3=7. Tumors with a Gleason score of 7 have a significantly worse prognosis than those with a Gleason score of 6. Given the adverse prognosis associated with Gleason pattern 4, one would expect that whether a tumor is Gleason score 3+4 or 4+3 would influence prognosis (1). This issue has been controversial in the literature, however, most of the studies have shown that Gleason score 4+3 has a worse prognosis than Gleason score 3+4 (2,3). Recently we evaluated the biochemical (PSA) progression following radical prostatectomy in 300 patients according to Gleason score 3+4 and 4+3 in the surgical specimens. Of the total of 300 patients, 140/300 (46.6%) patients were Gleason score 3+4=7 and 37/300 (12.3%) patients Gleason score 4+3=7. The 4-year biochemical (PSA) progression-free survival rate with Gleason score 3+4 and Gleason score 4+3 was 60% and 30%, respectively (log-rank, p=0.046).

Another topic in the updated nomogram relates to clinical stage. According to the authors the dramatic decrease in clinical stage T2c compared with the present series used in the previous models resulted in T2b and T2c being combined as a single predictor in the nomogram. According to the 2002 TNM classification of malignant tumors, T2b involves more than half of one lobe, but not both lobes. Some studies did not found this stage in surgical specimens. Eichelberger & Cheng (4) question the existence of a true pathologic stage pT2b tumor. They studied 369 prostate cancer patients treated by radical prostatectomy. Prostate cancers were multifocal in

312 cases (85%). The majority of the specimens were pathologic stage pT2 (276, or 75%). Using the 2002 TNM staging criteria, 54 (15%) of the tumors were stage pT2a, 222 (60%) were pT2c, 75 (20%) were pT3a, and 18 (5%) were pT3b. No pathologic stage pT2b tumors were identified. The findings of Quintal et al. (5) using a point-count method for evaluating tumor extension, are in accordance with Eichelberger and Cheng (3). No tumor pathologic stage pT2b was found and the frequency of the stages in Quintal's series is very similar to theirs: stage pT2a, 28 (12.50%); pT2c, 138 (61.61%); pT3a, 30 (13.39%); and, pT3b 28 (12.50%).

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Basal Cell Carcinoma of the Prostate: A Clinicopathologic Study of 29 Cases

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We studied 29 cases of basal cell carcinoma of the prostate including what others call adenoid cystic carcinoma of the prostate. Patients' age ranged from 42 to 89 (mean 69) years. The most common methods of diagnosis was transurethral resection (TURP) (n=29) and needle biopsy (n=9). In 28/29 cases, slides were reviewed and 24 (86%) cases showed more than 1 pattern: adenoid cysticlike (AC-P) pattern and small solid nests with peripheral palisading were the most predominant patterns, each seen in 18 cases (64%). Other patterns included: basal cell hyperplasialike in 9 cases (32%); small tubules occasionally lined by a hyaline rim in 9 cases (32%), with 4 of these cases also demonstrating intermingling cords of cells; and large solid nests in 8 cases (28.5%), 5 of which had central necrosis. Fourteen cases of small nests and tubules were centrally lined by eosinophilic cells. Desmoplasia was noted in 20 (71%) cases. Infiltration around benign glands was seen in 10 (36%) cases, with predominantly small nests and AC-P. Invasion of thick muscle bundles of the bladder neck was seen in 10 of 21 TURP cases. Perineural invasion was noted in 3 cases with AC-P and 1 case of small basaloid nests. Perineural and vascular invasion was seen in 2 basal cell carcinomas with large basaloid nests.

Mitoses ranged from 0 to 60/10 hpf (mean=4). bcl2 was diffusely positive in 22/24 (92%) cases. Ki67 ranged from 2% to 80% (mean=23%). Ki67 > or =20% was seen in 13 (56.5%) cases, including all patterns except small solid nests. Basal cell markers (HMWCK, p63) either: (1) highlighted multiple layers of cells in 15/25 (60%) cases with sparing of the inner most luminal layer; (2) labeled just the outermost layers in 6/25 (24%) cases; or (3) reacted with only a few scattered cells in 4/25 (16%) cases (3 with large solid nests with central necrosis, 1 with tubules and cords). Seven patients had RP with: 5/7 showing extraprostatic extension with 1/5 also showing seminal vesicle involvement and 2/5 also with a positive margin; 1/7 having organ confined disease; and 1/7 showing no residual disease. An additional 11 cases showed extraprostatic extension on TURP with bladder neck invasion (n=10) or periprostatic adipose tissue invasion (n=1). Of 29 (65.5%) cases, 19 had follow-up > 1 year with a mean of 4.3 years (1 to 19 y). Of 19 (77%) cases, 14 had no evidence of disease after 1 to 19 (mean 5.8) years. Of 19 patients, 4 locally recurred with 2 after TURP, 1 after enucleation, and 1 after RP. Metastases developed in 4/29 patients: 1 in lung, 1 in lung and liver, 1 in lung, bone and liver, 1 in penile urethra. Basal cell carcinomas are rare tumors with a broad morphologic spectrum. These tumors predominantly show an indolent course with local infiltrative behavior. A small subset behaves aggressively with local recurrences and distant metastases. The most common morphology among those with an aggressive behavior is large solid nests more often with central necrosis, high Ki67%, and less staining with basal cell markers.

Editorial Comment

Basal and stem cells comprise the proliferative compartment of the prostatic acinus. There is a spectrum of basal cell lesions including typical hyperplasia, atypical hyperplasia, adenoma, and carcinoma (or adenoid cystic carcinoma). The latter is a rare tumor initially considered with an indolent biologic potential (1). In 2003, Iczkowski et al. (2) published the largest series at that time calling attention to the potential aggressiveness of this tumor requiring ablative therapy. From a total of 19 patients, 54 (21%) developed metastases.

Ali and Epstein's is the largest series so far of basal cell carcinoma (or adenoid cystic carcinoma) of the prostate. Of a total of 29, 19 patients had follow-up >1 year: 14 patients had no evidence of disease after 1 to 19 (mean 5.8 years); 4 locally recurred and 4 developed metastases.

The authors conclude that these tumors predominantly show an indolent course with local infiltrative behavior. A small subset behaves aggressively with local and distant metastases. The most common morphology among those with aggressive behavior is large solid nests more often central necrosis, high Ki67%, and less staining with basal cell markers.

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INVESTIGATIVE UROLOGY

The Complex Structure of the Smooth Muscle Layer of Spermatic Veins and Its Potential Role in the Development of Varicocele Testis

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Eur Urol. 2007; 51: 1402-9; discussion 1410

Objectives: Varicocele, a dilatation of the pampiniform venous plexus, is considered to cause male infertility. The exact mechanism of varicocele development is not clarified yet. This study focused on the structure of varicocele veins, compared with normal spermatic veins, and its potential role in varicocele development.
Methods: Morphologic and immunohistochemical studies using antibodies against vWF and neurofilament-200 (NF-200) were performed on spermatic vein fragments of 20 varicocele patients and 40 normal spermatic cords. Casting preparation of veins was performed on five normal spermatic cords.
Results: Casting preparation frequently revealed circular constrictions of normal spermatic vein lumina. Histologic evaluation showed a strong longitudinal smooth muscle layer in the adventitia of large veins in addition to the circularly organised tunica media. Serial sections showed smooth muscle fibres branching from the outer longitudinal into the inner circular layer. Immunostaining for vWF revealed high vascularisation of this outer layer. Interestingly, the number of nerve fibres marked by NF-200 immunostaining was considerably higher in large veins compared to the testicular artery. The longitudinal smooth muscle layer was significantly degraded in the presence of varicocele grades I and II, and did not even exist in varicocele grade III. Correspondingly, the number of vasa vasorum and nerve fibres was reduced in varicocele veins.
Conclusions: Our data show a complex smooth muscle organisation of spermatic veins, which serves the basis for a contractile mechanism, providing an effective blood transport through pampiniform plexus. This mechanism is obviously damaged in the varicocele. Molecular processes behind this impairment remain to be clarified.

Editorial Comment

The authors of this interesting and original study aimed to assess whether there are anatomic and structural differences between normal spermatic veins and varicocele veins, and whether these differences might serve as a basis for an explanation of the development of varicocele.

They demonstrated by the first time that the anatomic structure of the large spermatic veins of the pampiniform plexus is composed of a strong longitudinal smooth muscle layer in the tunica adventitia with oblique muscle fibers that reach the inner circular smooth muscle layer of the tunica media. The authors proposed that this assemblage of muscle layers could lead to a mechanism of peristaltic venous transportation. This contractile function apparently is disturbed in varicocele by morphological changes of the venous wall that may lead to impairment of blood venous return, promoting the development of varicocele.

The take home message of this paper is that the morphologic changes of the venous wall of spermatic cord veins, including a degeneration of the outer smooth muscle layer, lead to an impairment of the contractile function and blood return of the veins, promoting the development of varicocele testis.

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An Electron Microscopic Examination of the Intravesical Ureter in Children with Primary Vesico-Ureteric Reflux

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BJU Int. 2007; 99: 1127-31

Objective: To determine the structure of the intravesical distal ureteric wall of patients with primary vesico-ureteric reflux (VUR), and to compare the findings with previous reports.
Materials and Methods: Specimens of the distal intravesical ureteric segments were taken surgically from children undergoing ureteric reimplantation surgery for primary VUR. There were 24 distal intravesical ureteric specimens from 15 children (nine female and six male). Ultra-thin sections were cut from the specimens and examined with a transmission electron microscope.
Results: The appearance of the muscular layers of the specimens of different grades differed markedly. There were intercellular oedematous areas in the muscular layer in specimens from patients with grade 2 and 3 VUR. In specimens from grade 4 VUR there were also intracytoplasmic vacuoles in the smooth muscle cells. The most marked and striking changes were in the specimens from children with grade 5 VUR, in which there were large intercellular oedematous areas and prominent large intracytoplasmic vacuoles.
Conclusion: Refluxing ureters differ from normal ureters in having disorganized smooth muscle fibres and altered smooth muscle cell structure, leading to incompetence of the valve mechanism. Although we cannot confirm that these pathological changes in the smooth muscle layer of the intravesical ureteric wall are caused by VUR we conclude that, with increasing degrees of reflux, the degree of smooth muscle damage increases, and that the rate of spontaneous resolution decreases.

Editorial Comment

The authors taken specimens of intravesical distal ureteric segments surgically removed from children undergoing ureteric reimplantation due to primary vesicoureteral reflux (VUR) of different degrees. They studied by histological methods and for the first time by transmission electron microscopy (TEM), the structure and structural changes of the specimens. The results were compared with controls and with the grades of VUR.

The authors found no marked differences in the morphology of the tunica adventitia, and no pathology was detected. The structure and distribution of collagen fibers, fibrocytes and fibroblasts in the adventitia were similar in all specimens. The transitional epithelial cells were closely arranged in the tunica mucosa and the submucosa contained collagen fibers, fibrocytes and fibroblasts in variable proportions. Further, the morphology of the lamina propria and the tunica mucosa were similar in all specimens, and no ultrastructural change or pathology was detected.

On the other hand, the findings demonstrated that the appearance of the muscular layers of the specimens differed markedly with VUR grade. The distribution of intracytoplasmic vacuoles in smooth muscle cells and intercellular edema are clearly shown by semi-quantitative methods. Intercellular edema was sparse in specimens of grade 2–3 VUR, moderate in specimens of grade 4 and common in specimens of grade 5. Intracytoplasmic vacuoles were absent in specimens of grade 2–3 VUR, sparse in grade 4 and common in grade 5.

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RECONSTRUCTIVE UROLOGY

Artificial Urinary Sphincters Placed After Posterior Urethral Distraction Injuries in Children are at Risk for Erosion

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J Urol. 2007, 178: 1813-1815

Purpose: Management for posterior urethral disruption and concurrent bladder neck incompetence is controversial. Some groups recommend treatment with a Mitrofanoff catheterizable stoma, while others advocate urethral reconstruction with delayed placement of an artificial urinary sphincter. We report our experience with the latter strategy.
Materials and Methods: We reviewed the records of all patients with the above injury who were treated with end-to-end urethroplasty followed by delayed bladder neck artificial urinary sphincter placement from 1986 to 2006.
Results: Five patients had videourodynamic evidence of bladder neck incompetence coexisting with traumatic posterior urethral disruption. The etiology of bladder neck incompetence in all 5 patients was a known longitudinal tear through the bladder neck that occurred at the time of trauma. Each patient underwent end-to-end urethroplasty. Six to 12 months later the patients had persistent incontinence. Bladder function and urethral patency were documented by urodynamic, radiographic and endoscopic studies. A bladder neck artificial urinary sphincter was subsequently placed. Each operation was technically demanding due to fibrosis in the pelvis and around the bladder neck. All patients were initially continent but erosion of the artificial urinary sphincter into the bladder neck in 4, and the bladder neck and rectum in 1 occurred at a mean of 3 years (range 6 months to 8 years).
Conclusions: Placement of a bladder neck artificial urinary sphincter for managing urinary incontinence due to concurrent posterior urethral disruption and bladder neck incompetence is difficult and it risks delayed erosion. In this patient population we would strongly consider urinary diversion with a Mitrofanoff catheterizable stoma.

Editorial Comment

Stress urinary incontinence as a result of urethral injury occurs in approximately 10% of pelvic trauma cases. Urinary stress incontinence usually only occurs in those boys with posterior urethral disruption and an additional rabdosphincter injury. The primarily reconstructive approach with the placement of a suprapubic catheter secures healing but does not give any guarantee for functionality. Two possibilities occur after the removal of the transurethral catheter: incontinence or stricture. The incidence of urinary stress incontinence is lower compared to stricture development. The two major questions that occur are, when and which surgical approach to offer the pediatric patient, who suffers from stress urinary incontinence. Ashley & Husmann reported in their group of five patients to place an artificial sphincter 6-12 months after the reconstructive approach, which might be still too early regarding the extensive surgical approach and the not ideal position for the cuff of an AMS 800. In addition, the treated males were on average 11-year-old, who are still growing. This is most probably due to a consequence of one or all of the three mentioned arguments' failure.

Because of surgery for the after effects of the injury, the approach is sometimes invasive resulting in scars and poor vascularization. Secondly, especially the cuff around the bladder neck / prostate might cause not only obstruction but – due to the poor tissue quality with reduced vascularization – result in erosion in those patients in the follow-up because they are still growing. This might be an explanation of the average explantation time of 3 years (6 months to 6 years) after the implantation.

If an artificial urinary sphincter is at all considered in children and adults, it should be placed through the penoscrotal approach to the bulbar urethra (1). It is easier to access and the tissue is in most cases untouched,

which supports the healing and makes the whole approach less invasive. In the follow-up, an age-adapted cuff size exchange is easier to be performed. Some might argue that the smallest cuff might still be too big for the bulbar urethra, but local tissue or acellular matrices can be placed in-between the urethra and the cuff. This tissue or matrix protects the urethra and the cuff, avoiding erosions. The authors are correct that the approach to perform the Mitrofanoff catheterizable stoma in these patients is a very elegant way, too and an artificial urinary sphincter with an age-adapted cuff size is the second best choice beside the Mitrofanoff catheterizable stoma.

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Autologous Myoblasts and Fibroblasts versus Collagen for Treatment of Stress Urinary Incontinence in Women: A Randomised Controlled Trial

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Lancet. 2007 Jun 30;369(9580):2179-86

Background: Preclinical studies have suggested that transurethral injections of autologous myoblasts can aid in regeneration of the rhabdosphincter, and fibroblasts in reconstruction of the urethral submucosa. We aimed to compare the effectiveness and tolerability of ultrasonography-guided injections of autologous cells with those of endoscopic injections of collagen for stress incontinence.
Methods: Between 2002 and 2004, we recruited 63 eligible women with urinary stress incontinence. 42 of these women were randomly assigned to receive transurethral ultrasonography-guided injections of autologous myoblasts and fibroblasts, and 21 to receive conventional endoscopic injections of collagen. The first primary outcome measure was an incontinence score (range 0-6) based on a 24-hour voiding diary, a 24-hour pad test, and a patient questionnaire. The other primary outcome measures were contractility of the rhabdosphincter and thickness of both the urethra and rhabdosphincter. Analysis was by intention to treat. This trial is registered with Controlled-Trials.com, number CCT-NAPN-16630.
Findings: At 12-months' follow-up, 38 of the 42 women injected with autologous cells were completely continent, compared with two of the 21 patients given conventional treatment with collagen. The median incontinence score decreased from a baseline of 6.0 (IQR 6.0-6.0; where 6 represents complete incontinence), to 0 (0-0) for patients treated with autologous cells, and 6.0 (3.5-6.0) for patients treated with collagen ($p<0.0001$). Ultrasonographic measurements showed that the mean thickness of the rhabdosphincter increased from a baseline of 2.13 mm (SD 0.39) for all patients to 3.38 mm (0.26) for patients treated with autologous cells and 2.32 mm (0.44) for patients treated with collagen ($p<0.0001$). Contractility of the rhabdosphincter increased from a baseline of 0.58 mm (SD 0.32) to 1.56 mm (0.28) for patients treated with autologous cells and 0.67 mm (0.51) for

controls ($p<0.0001$). The change in the thickness of the urethra after treatment was not significantly different between treatment groups. No adverse effects were recorded in any of the 63 patients.
Interpretation: Long-term postoperative results and data from multicentre trials with larger numbers of patients are needed to assess whether injection of autologous cells into the rhabdosphincter and the urethra could become a standard treatment for urinary incontinence.

Editorial Comment

In recent years, the knowledge and awareness for female stress urinary incontinence has grown with the result that a wide range of different treatment options has become available. Treatment options improved with the increased knowledge of pelvic floor dysfunction and surgical options became less invasive by the year.

Obtaining autologous myoblasts of skeletal muscle-biopsies, cultivating them and transplanting them after differentiation into the external urethral sphincter herald a new era of incontinence therapy. In the current study of Strasser et al., 42 patients were treated by a transurethral, ultrasound-guided injection of myoblasts and fibroblasts. The control group of 21 patients received collagen in the conventional method.

After a mean follow-up of 12 months, urinary continence and improvement of the urethral rhabdosphincter was evaluated with questionnaires, voiding diaries, pad tests, transurethral ultrasonograpy and electromyography. Out of those treated with autologous myoblasts and fibroblasts, over 90% were completely dry, whereas in the control group, a success rate of only 9% was recorded.

Currently, experience with this new incontinence treatment comes from a single center, which has started to collaborate with others in order to verify the presented striking results. In addition to some doubts about the allocation concealment and ascertainment bias, it might be important which way the “material” is injected. The ultrasound-guided application might be more precise and effective than the classic visual-judged injections. The number of deposits needed to ensure good filling as well as coaptation of the urethral wall and thus compression of the urethral lumen, which must still be proven.

The presented results, the development of the clinical pathways of this procedure and new sources of stem cells to be transplanted might be one of the most important achievements in reconstructive urology of the last decade. By presenting a minimal invasive technique with a precise application into the location for a physiological function, a treatment option to regenerate sphincter function and to prevent urinary incontinence at an early stage becomes feasible.

Additional stem cell sources (1), which can be harvested easier and may be even true omnipotent stem cells in order to better reconstruct a rhabdosphincter are currently tested experimentally and might offer the possibility to treat high grade stress urinary incontinence.

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UROLOGICAL ONCOLOGY

Perioperative Complications of Radical Cystectomy in a Contemporary Series

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Eur Urol. 2007; 51: 397-401

Objectives: Radical cystectomy is the preferred standard treatment for patients with muscle-invasive bladder cancer. With improvements in intra- and perioperative care lower complication rates have been reported. We retrospectively evaluated our series of patients who underwent radical cystectomy for advanced bladder cancer for perioperative complications as well as operative time, postoperative hospital stay and transfusion rates.
Patients and Methods: Between April 1993 and August 2005, 516 radical cystectomies were performed for muscle infiltrating transitional cell carcinoma and other types of neoplastic diseases of the bladder at our institution. The average age was 66.3 yr (31-89).
Results: The perioperative mortality rate was 0.8%. A total of 141 patients (27.3%) developed at least one perioperative complication. The most frequent medical complications were subileus in 20 (3.9%) patients, deep venous thrombosis in 24 (4.7%), and enterocolitis in 10 (1.9%). Surgical complications included pelvic lymphoceles in 42 (8.1%) patients, wound dehiscence in 46 (8.9%), pelvic hematoma in 4 (0.8%), peritonitis in 4 (0.8%) and small bowel obstruction in 4 (0.8%). The total early reoperation rate was 6.2%. Operative time, postoperative hospital stay and average number of blood units transfused decreased over the period 1993-2005.
Conclusions: Radical cystectomy today is a procedure with an acceptable rate of perioperative morbidity and mortality. Improvements in surgical technique and anaesthesia as well as increased quality of perioperative care in recent years have resulted in reduced morbidity and shorter hospital stay.

Editorial Comment

This article focuses on the complications of a large cystectomy series of a so-called high-volume center with around 40 cystectomies annually. The complication rate in this series, which is very identical to other large volume series, is roughly around 30%, mortality at 1%. Interestingly, median operative time for ileal conduits was 5.7 hours and for neobladders 6.5 hours.

Patients should be counseled about these realistic data before surgery.

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Natural History of Biochemical Recurrence after Radical Prostatectomy: Risk Assessment for Secondary Therapy

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Eur Urol. 2007; 51: 1175-84

Purpose: A persistently elevated or rising serum level of prostate-specific antigen (PSA) after radical prostatectomy is indicative of recurrent prostate cancer. The natural history of PSA-defined biochemical recurrence (BCR) is

highly variable. While a rising PSA level universally antedates metastatic progression and prostate cancer-specific mortality (PCSM), it is not a surrogate for these endpoints. Thus, the management of patients with BCR is controversial.
Methods: A literature review was conducted to determine the incidence and natural history of BCR, prognostic factors for clinical progression (CP), and the available evidence supporting local or systemic salvage therapy for these patients.
Results: BCR is best defined as two successive PSA levels > or =0.4 ng/ml, as this correlates most accurately with CP. PSA doubling time (PSA-DT) and prostatectomy Gleason score are the variables that best predict the development of distant metastasis and PCSM. Prognostic models based on these and other variables are useful for assessing the need for salvage therapy and the anticipated outcome following local salvage therapy. A treatment algorithm for managing patients with post-prostatectomy BCR was devised.
Conclusions: Management of patients with BCR after prostatectomy continues to be a complex and challenging issue. Improved methods for risk stratification allow for identification of patients who require treatment. Furthermore, these methods aid in determination of the pattern of disease recurrence, thereby guiding treatment modality. Randomized trials are essential to determine the value of local or systemic salvage therapy strategies in this patient population.

Editorial Comment
The percentage of biochemical recurrence after radical prostatectomy (RP) in several large series varies between 15% and 33% with a median time to failure between 2 and 3.5 years. This article gives a straightforward summary of several published trials on this patient group. Several definitions of failure are discussed and an overview on the results of different series is given. Interestingly, only two of seven trials showed a benefit of early hormone therapy in recurrent prostate cancer. Based on these data, a meaningful treatment algorithm is provided.

Article focuses on the complications of a large cystectomy series of a so-called high-volume center with around 40 cystectomies annually. The complication rate in this series, which is very identical to other large volume series, is roughly around 30%, mortality at 1%. Interestingly, median operative time for ileal conduits was 5.7 hours and for neobladders 6.5 hours .

Patients should be counseled about these realistic data before surgery.

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NEUROUROLOGY & FEMALE UROLOGY

Correlation of Bladder Base Elevation with Pelvic Floor Hypertonicity in Women with Lower Urinary Tract Symptoms

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Neurourol Urodyn. 2007;26:502-6

Aims: To determine whether the bladder base elevation as revealed by cystogram under fluoroscopy is associated with pelvic floor hypertonicity or bladder outlet obstruction (BOO) in women.
Methods: Sixty-two women who were referred to our videourodynamic laboratory for assessment of lower urinary tract symptoms (LUTS) were included in this retrospective analysis. Thirty-one of these women with bladder base elevation-revealed by cystogram under fluoroscopy during videourodynamic study-served as the experimental group, and another group of 31 women without bladder base elevation served as control. None of the patients had neuropathy, previous pelvic surgery or chronic urinary retention. The clinical symptoms, urodynamic diagnosis, and parameters were compared between the two groups.
Results: The mean voiding pressure (Pdet. Qmax) and postvoid residual (PVR) were significantly greater, and maximum flow rate (Qmax) and voided volume were significantly lower in the bladder base elevation group. When a Pdet. Qmax of >or=35 cm H2O combined with a Qmax of <or=15 ml/sec in pressure flow study was used to diagnose BOO, significantly more patients in the bladder base elevation group had BOO than controls (51.6% vs. 9.7%, P=0.0003). Pelvic floor muscle electromyogram (EMG) was dyscoordinated during the voiding phase in 18 (58.1%) and 9 (29%) of the patients with and without bladder base elevation, respectively (P=0.0212).
Conclusion: Women with LUTS and bladder base elevation revealed in the filling phase of videourodynamic study had significantly higher voiding pressure and incidence of dyscoordinated pelvic floor EMG activities during voiding, suggesting a higher incidence of BOO and pelvic floor hypertonicity. Copyright (c) 2007 Wiley-Liss, Inc.

Editorial Comment

The authors in this study highlight another potential advantage of radiographic imaging of the bladder during the evaluation of urinary incontinence. They noted that female patients with lower urinary tract symptoms and fluoroscopic bladder base elevation would exhibit higher voiding pressures and abnormal pelvic floor EMG activity. Though this study population did not have any additional radiographic imaging of the pelvis to preclude a mass effect causing the elevation of the bladder base, it was noted that the bladder base did descend during the voiding phase in all patients except for those who had evidence of bladder outlet obstruction. It would be of interest to see if patients who have iatrogenic induced bladder base elevation on radiographic imaging from surgical repair of the anterior compartment will have the same degree of voiding dysfunction as noted by these patients. The value of fluoroscopy in the evaluation of female lower urinary tract symptoms has already been highlighted in the literature (1).

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Pelvis Architecture and Urinary Incontinence in Women.

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Eur Urol. 2007; 52:239-44.

Objectives: To examine anatomic features in the pelvic bones and muscles in women with urinary incontinence (UI).
Material and Methods: Between October 2005 and January 2006, 212 consecutive women underwent pelvic computerized tomography in our center. Preceding the examination, all women completed a clinical and demographic questionnaire including detailed questions about UI. Several anatomic parameters using multiplanar reformation and three-dimensional techniques (volume rendering) were examined. We specifically evaluated different bony parameters, pelvic floor muscle angles, densities, and cross-sectional areas. Ninety-three women (46.5%) had UI; the remaining women served as the control group. A logistic regression model was used to evaluate risk factors for UI.
Results: The mean age was 55.5 yr (range: 19-90). Women who suffered from UI were older (60.97 vs. 50.77 yr, $p<0.0001$), had higher body mass index (27.65 vs. 25.49, $p<0.01$), had more previous hysterectomies (21.5% vs. 6.5%, $p<0.005$), underwent more pelvic irradiation (9.7% vs. 1.8%, $p<0.05$), and had more diabetes mellitus (31.2% vs. 13.1%, $p<0.005$). Patient's age and previous hysterectomy were found to be the major clinical risk factors for UI (OR: 1.029, $p=0.002$; OR: 2.94, $p=0.024$, respectively). Logistic regression analysis on all clinical and morphologic variables yielded the following risk factors: pelvic-inlet diameter (OR: 1.216, $p<0.0001$), pelvic-inlet anterior-posterior diameter (OR: 1.109, $p=0.003$), pelvic-outlet diameter (OR: 1.077, $p=0.011$) and transverse perineal muscle cross-section diameter (OR: 0.773, $p<0.0001$).
Conclusions: Pelvic inlet and outlet dimensions are major risk factors for developing UI in women. These findings may lead to a better comprehension of the pathophysiology of UI in women.

Editorial Comment

The authors present a very interesting review noting that pelvic inlet and outlet diameters were significantly larger in the incontinent women of their study group than those who were continent. That these increased diameters were congenital or from maturational changes remained unanswered. Perhaps the etiology is unimportant; and in addition, continence rates also depend on the pelvic muscle mass present as noted in this paper. This presentation raises the thought that perhaps the hormonally induced relaxation of the pelvic ligaments and the subsequent increased pelvic diameter associated with childbirth may be the significant contributor to the transient urinary incontinence of pregnancy.

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PEDIATRIC UROLOGY

Recurrent Urinary Tract Infections in Children: Risk Factors and Association with Prophylactic Antimicrobials.

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Context: The evidence regarding risk factors for recurrent urinary tract infection (UTI) and the risks and benefits of antimicrobial prophylaxis in children is scant.
Objectives: To identify risk factors for recurrent UTI in a pediatric primary care cohort, to determine the association between antimicrobial prophylaxis and recurrent UTI, and to identify the risk factors for resistance among recurrent UTIs.
Design, Patients and Setting: From a network of 27 primary care pediatric practices in urban, suburban, and semirural areas spanning 3 states, a cohort of children aged 6 years or younger who were diagnosed with first UTI between July 1, 2001, and May 31, 2006, was assembled. Time-to-event analysis was used to determine risk factors for recurrent UTI and the association between antimicrobial prophylaxis and recurrent UTI, and a nested case-control study was performed among children with recurrent UTI to identify risk factors for resistant infections.
Main Outcome Measures: Time to recurrent UTI and antimicrobial resistance of recurrent UTI pathogens.
RESULTS: Among 74 974 children in the network, 611 (0.007 per person-year) had a first UTI and 83 (0.12 per person-year after first UTI) had a recurrent UTI. In multivariable Cox time-to-event models, factors associated with increased risk of recurrent UTI included white race (0.17 per person-year; hazard ratio [HR], 1.97; 95% confidence interval [CI], 1.22-3.16), age 3 to 4 years (0.22 per person-year; HR, 2.75; 95% CI, 1.37-5.51), age 4 to 5 years (0.19 per person-year; HR, 2.47; 95% CI, 1.19-5.12), and grade 4 to 5 vesicoureteral reflux (0.60 per person-year; HR, 4.38; 95% CI, 1.26-15.29). Sex and grade 1 to 3 vesicoureteral reflux were not associated with risk of recurrence. Antimicrobial prophylaxis was not associated with decreased risk of recurrent UTI (HR, 1.01; 95% CI, 0.50-2.02), even after adjusting for propensity to receive prophylaxis, but was a risk factor for antibimicrobial resistance among children with recurrent UTI (HR, 7.50; 95% CI, 1.60-35.17).
Conclusion: Among the children in this study, antimicrobial prophylaxis was not associated with decreased risk of recurrent UTI, but was associated with increased risk of resistant infections.

Editorial Comment

This is a very large network of 27 primary care pediatric practices using a common electronic health record attempting to identify: the risk factors for recurrent UTI's in pediatrics, the association between prophylactic antimicrobials and recurrent UTI's and the risk factors for resistance of recurrent UTI's in patients six years or younger

This is a retrospective study and the authors tried to review data on their patients that were outside their health care network and laboratory and x-ray data were reviewed manually. There was a 5% random sampling of the actual charts to validate the study. Patients had to have at least two clinic visits in the health network. Positive cultures were defined at 50,000 colony forming units and these were all catheterized specimens and they excluded voided or bagged urine specimens. Patients were excluded that had significant other comorbidities. It is important to note that a resistant culture was defined as a pathogen, resistant to "any" antimicrobial. They reviewed VCUG's that were performed on their patients and did a highly credible job of analyzing the statistics.

They had a total of 74,974 patients six years or under who had at least two clinic visits. Six-hundred sixty-six of them had a confirmed UTI and 611 were in the study group. There was a 13.6% recurrence rate resulting in 12% recurrence per year. 61% of the recurrences were due to a pathogen with antimicrobial resistance. 88.9% with a first UTI were female and 65.5% of all patients did not undergo a VCUG even though under two years of age the American Academy of Pediatrics recommends the VCUG to be performed. 58% of the children under two years-of-age in the study had a VCUG performed. Antimicrobial prophylaxis considered as a time-varying covariate had no significant effect on the risk of recurrent urinary tract infection in a multivariate analysis. Conversely exposure to prophylactic antimicrobials significantly increased the likelihood of resistant infections.

Their data showed the cumulative incidence from 0-6 years of having a first UTI was 4.2% and the rate of recurrence per year was 12%. Their conclusions were that Caucasians from three to five years of age with Grade IV-V vesicoureteral reflux were associated with increased risk of recurrent urinary tract infection. Sex of the patient and Grade I-III vesicoureteral reflux were not associated with increased risk of recurrence. An antimicrobial prophylaxis was not associated with lower risk of recurrent UTI but prophylaxis was associated with increased risk of resistant infections.

Electronic medical record data from insurance networks have significant study difficulties especially with missed results from outside the network and with a large group of physicians treating a large group of patients, the patterns of care may vary significantly. Noted in this study was the absence of VCUG in nearly ? of patients in spite of the recommendations of the American Academy of Pediatrics to do so. Also all patients had catheterized specimens and yet most physicians would accept a clean-catch negative specimen or a clean-catch single organ positive specimen. Antibiotic exposure is difficult to judge especially since patients may have had antibiotics for different etiologies prior to joining the network and having their first UTI.

One of my biggest concerns about the data is the definition of antibiotic resistance as the pathogen having resistance to any of the antibiotics tested for sensitivity. It almost seems unusual in my practice to have urine cultures that are pan-sensitive, even in first time UTI patients on an outpatient basis. A second large concern was no attempt to ask questions about bladder or bowel function and it is well-known that constipation and voiding dysfunction have a large impact on vesicoureteral reflux and urinary tract infection occurrences and this is a significant oversight in their study. This study still has produced provocative data and should be read and studied because of its wide circulation.

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Is Antibiotic Prophylaxis Necessary in Infants with Obstructive Hydronephrosis?

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Purpose: We investigated the relationship between the level of obstruction of the upper urinary tract and the risk and onset of urinary tract infection in infants with severe obstructive hydronephrosis to determine the need for antibiotic prophylaxis.

Materials and Methods: A total of 105 patients were prenatally diagnosed with severe hydronephrosis (Society for Fetal Urology grade III or IV) due to upper urinary tract obstruction between 1994 and 2004. Of these patients 75 had ureteropelvic junction obstruction and 30 had lower ureteral obstruction. We retrospectively evaluated the clinical course and incidence of urinary tract infection during the first 12 months postnatally without antibiotic prophylaxis.
Results: The incidence of overall urinary tract infection during followup was 36.2% (38 of 105 patients), and it demonstrated a higher trend with lower ureteral obstruction than with ureteropelvic junction obstruction (50% vs 30.7%, p=0.063). Most cases of urinary tract infection (92.8%) occurred before age 6 months, with a mean age at onset of 2.6 months. Of 105 patients 77 (73.3%) underwent corrective surgery at a mean age of 3.8 months. The incidence of urinary tract infection before surgical correction was 33.8% at a mean age of 2.1 months. The incidence of urinary tract infection in surgical cases was significantly higher with lower ureteral obstruction than with ureteropelvic junction obstruction (54.2% vs 24.5%, p=0.011).
Conclusions: Urinary tract infection in infants with severe obstructive hydronephrosis has a high incidence, occurs before age 6 months and is more common with lower ureteral obstruction than with ureteropelvic junction obstruction. These findings indicate that infants with severe hydronephrosis due to obstruction of the upper urinary tract should receive antibiotic prophylaxis.

Editorial Comment

105 congenital hydronephroses due to upper urinary tract blockages were evaluated during a ten year period. 99 were unilateral and six were bilateral. Forty-seven had SFU Grade III hydronephrosis and 58 had Grade IV. None of the 82 males were circumcised. All patients were followed without prophylactic antibiotics. Seventy-five had ureteropelvic junction obstruction and 30 patients had lower urinary tract obstruction, 18 of which had ureterovesical junction obstruction. There were 10 ureteroceles and 2 ectopic ureters. Surgery was performed if a UTI occurred, or when there was an increased anterior and posterior pelvis diameter or an increased drainage time with worsening obstructive curve or decreasing relative renal function less than 40.

The overall incidence of UTI during follow up was 36.2% (38/105 patients), 50% of the lower urinary tract obstructions and 30.7% of the upper urinary tract obstructions had a UTI. 92.8% of these infections occur before six months of age with a mean age of onset of 2.6 months. Of the 105 patients, 77 underwent corrective surgery at a mean age of 3.8 months. Their data suggested that there is a higher risk of infection for obstructions near the bladder and they recommended prophylactic antibiotics for infants with SFU Grade III and IV obstruction during observation periods.

This is a higher rate of infection than is sometimes reported and a much higher surgery rate at earlier ages than is usually recommended. For ureteropelvic junction obstructions, half of the patients will resolve spontaneously by waiting 18 months or more. It is surprising that their patients either had infections or other indications for surgery by a mean age of 3.8 months. This probably indicates that this is a highly selective group of patients but still suggests that prophylactic antibiotics may be required.

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