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## UROLOGICAL SURVEY

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## STONE DISEASE

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### **Evaluation of optimal color for stent identification in a hemorrhagic environment**

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**Introduction:** The endoscopic deployment and extraction of endoluminal stents, such as ureteral stents, is commonplace in contemporary medical management of many diseases. In a hemorrhagic environment, endoscopic identification of a stent can be challenging. To date, no study has evaluated the optimal color for endoscopic stent identification.

**Methods:** Eight different colored stents were placed in a simulated bladder model. Each stent color was evaluated in saline and three progressively more concentrated bloody environments. A flexible cystoscope was used to make 15-second video clips of the stents in each environment. Participants viewed the videos in a random sequence. Participants were asked to identify the color of each stent, and rate the identification on a 10-point scale. Logistic regression models were used to model the relationship between identification, stent color, environment, and experience.

**Results:** Forty-seven participants reviewed the videos. In clear and mildly bloody environments, blue stents had the highest identification ( $p < 0.06$ ,  $p = 0.001$ , respectively). In moderately bloody environments, yellow stents had the highest identification ( $p < 0.01$ ), whereas silver stents had the highest identification in severely bloody settings ( $p = 0.004$ ). Blue and green stents were identified most commonly and received the highest identification scores in all environments. Level of training and experience with endoscopy were not significantly associated with the correct response rate.

**Conclusions:** This study demonstrates that the color of a stent plays an important role in endoscopic identification. Our results suggest that blue and green colors offer superior visibility in both clear and hemorrhagic environments.

### **Editorial Comment**

The authors have identified an issue that may be a critical consideration for devices utilized in endoscopic, laparoscopic and robotic procedures. For example, identification of color in a hemorrhagic environment would be important for such instruments as laser fiber coatings and aiming beams, laparoscopic clips and staplers, suction tips, and vascular clamps. As such, this work paves the way for further evaluations of a wide variety of instrumentation in an endoscopic and laparoscopic environment that utilizes fiberoptic or digital imaging technology.

This study suggests that if a stent is being placed at the end of a procedure associated with significant bleeding, one should consider the use of a yellow or silver stent to minimize the risk of inadvertently advancing the stent beyond the ureteral orifice. Otherwise, blue and green lets the stent be seen.

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**Hemostatic sandwich to control percutaneous nephrolithotomy tract bleeding**

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J Endourol. 2010; 24: 1415-9.

**Background and Purpose:** Significant bleeding necessitating use of a tamponade balloon, embolization, or renal exploration is a rare but catastrophic complication after percutaneous nephrolithotomy (PCNL). The purpose of this study is to review the success of a novel, minimally invasive technique for controlling percutaneous tract bleeding that is refractory to conventional measures.

**Materials and Methods:** A retrospective review was performed on four patients with refractory tract hemorrhage that was managed with a novel gelatin matrix hemostatic sandwich technique. In this technique, a 5F angiographic reentry catheter was placed through the kidney into the bladder and a 22F Councill-tip catheter balloon was passed over this catheter and positioned so that the inflated balloon would occlude the inner surface of the nephrostomy tract. Next, a 16F Councill-tip catheter was placed over a second wire so that the uninflated balloon was just underneath the skin surface. Gelatin matrix hemostatic sealant was then injected to fill the tract. Inflation of the outer balloon completely sealed the tract, completing the hemostatic sandwich.

**Results:** This technique was successfully applied to four patients with tract bleeding that would not stop with pressure or a conventional nephrostomy tube alone. The average estimated blood loss was 562 mL, and three of four patients avoided transfusion. All postoperative hemoglobin values stabilized within 2 days of surgery. There were no major or minor complications after use of this technique. No patients needed angioembolization or renal exploration.

**Conclusions:** This novel hemostatic sandwich technique should be considered as an option for the control of refractory tract hemorrhage after PCNL.

**Editorial Comment**

The authors describe a novel technique for acute control of post-PCNL hemorrhage. One of the potential challenges for this technique would be the ability to maintain sufficient tension/traction on the inner balloon to avoid inadvertent seepage of the hemostatic agent into the collecting system. One might propose that the sandwich balloon technique might be sufficient to tamponade the bleeding without the need for hemostatic adjuncts instilled into the tract. However, the authors hypothesize that in addition to activating the final step of the clotting cascade, the gelatin matrix hemostatic sealant (GMHS) swells up to 20% after application, thereby augmenting the tamponade pressure within the tract. One might question whether 5 cc of GMHS is the optimal volume. Amplatz sheaths range in length from 16-30 cm, so the volume of the parenchyma displaced by a 30F sheath would range from 12-24 cc.

The authors note that superselective angioembolization can lead to loss of up to 15% of the renal parenchyma, thus novel techniques such as these are important adjuncts to the PCNL armamentarium. The authors emphasize the need for close hemodynamic monitoring for any signs of persistent bleeding in the perioperative period.

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**The learning curve for laparoscopic radical prostatectomy: an international multicenter study**

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J Urol. 2010; 184: 2291-6

**Purpose:** It is not yet possible to estimate the number of cases required for a beginner to become expert in laparoscopic radical prostatectomy. We estimated the learning curve of laparoscopic radical prostatectomy for positive surgical margins compared to a published learning curve for open radical prostatectomy.

**Materials and Methods:** We reviewed records from 8,544 consecutive patients with prostate cancer treated laparoscopically by 51 surgeons at 14 academic institutions in Europe and the United States. The probability of a positive surgical margin was calculated as a function of surgeon experience with adjustment for pathological stage, Gleason score and prostate specific antigen. A second model incorporated prior experience with open radical prostatectomy and surgeon generation.

**Results:** Positive surgical margins occurred in 1,862 patients (22%). There was an apparent improvement in surgical margin rates up to a plateau at 200 to 250 surgeries. Changes in margin rates once this plateau was reached were relatively minimal relative to the CIs. The absolute risk difference for 10 vs 250 prior surgeries was 4.8% (95% CI 1.5, 8.5). Neither surgeon generation nor prior open radical prostatectomy experience was statistically significant when added to the model. The rate of decrease in positive surgical margins was more rapid in the open vs laparoscopic learning curve.

**Conclusions:** The learning curve for surgical margins after laparoscopic radical prostatectomy plateaus at approximately 200 to 250 cases. Prior open experience and surgeon generation do not improve the margin rate, suggesting that the rate is primarily a function of specifically laparoscopic training and experience.

**Editorial Comment**

This multi-institutional study redefined some of the end points to measure improvement of learning curve for laparoscopic radical prostatectomy (LRP).

The authors reported previously biochemical recurrence as measurement of surgical technique improvement. The current study focused on positive surgical margins (PSM) rates to determine the effects of changes in technique or training. This study estimated the overall PSM rate among patients treated with LRP without robotic assistance at North American and European institutions, and estimated the learning curve using PSMs as an end point. In addition, it was evaluated the effects of prior open experience and whether first generation surgeons had results different from those of the second generation who benefitted from experience. The authors compared the laparoscopic radical prostatectomy (RP) learning curve for PSMs to that of open RP, and examined the margins learning curve in light of the learning curve for biochemical recurrence.

PSMs were reported in 1,862 patients (22%) of this multicenter series. The learning curve for PSMs after LRP, although fairly similar to that of the open technique, appears to be slower. SM rates improve with increasing surgeon experience until a plateau at around 200 to 250 cases. Prior open experience and surgeon

generation do not improve margin rates, suggesting that these are primarily a function of specifically laparoscopic experience.

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### **Does prior abdominal surgery influence outcomes or complications of robotic-assisted laparoscopic radical prostatectomy?**

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*Urology. 2010; 76: 1125-9*

**Objectives:** To determine whether robotic-assisted laparoscopic radical prostatectomy (RALP) in patients with prior abdominal surgery is associated with increased operating times, positive surgical margins, or complications.

**Methods:** An institutional review board-approved retrospective review of a prospective, prostatectomy database was performed. Patients undergoing surgery between January 1, 2004, and February 29, 2008 were included. Transition from open retropubic prostatectomy to RALP took place through 2004, at which point all surgical candidates were offered RALP, regardless of prior surgical history. Learning curves from all surgeons were included. Patients with prior abdominal surgery were compared with those patients without prior surgery with respect to total operating time, robotic-assist time, surgical margin positivity, and rate of complications.

**Results:** A total of 1083 patients underwent RALP between January 1, 2004, and February 29, 2008, at our institution; of these, 839 had sufficient data available for analysis. In all, 251 (29.9%) patients had prior abdominal surgery, whereas 588 (70.1%) had no prior abdominal surgery. Total operating times were 209 and 204 minutes ( $P = .20$ ), robotic console times were 165 and 163 minutes ( $P = .59$ ), and surgical margin positivity was 21.1% and 27.2% ( $P = .08$ ) for patients with and without prior abdominal surgery, respectively. The incidence of complications was 14.3% and 17.3% for patients with and without prior abdominal surgery ( $P = .33$ ).

**Conclusions:** Prior abdominal surgery was not associated with a statistically significant increase in overall operating time, robotic assist time, margin positivity, or incidence of complications in patients undergoing RALP. Robotic prostatectomy can be safely and satisfactorily performed in patients who have had a wide variety of prior abdominal surgery types.

### **Editorial Comment**

The authors presented complications of 839 men that underwent robotic-assisted laparoscopic radical prostatectomy. Approximately 1/3 of patients (251) had prior abdominal surgery, whereas 588 (70.1%) had no prior abdominal surgery. When these 2 groups were studied, operating times, robotic console times, and positive surgical margin were not significantly different for patients with and without prior abdominal surgery. Moreover, the incidence of complications was 14.3% and 17.3% for patients with and without prior abdominal

surgery ( $p = 0.33$ ). This study confirmed a well known data in other surgical specialties, including ours own, that previous abdominal surgery does not increase the morbidity of laparoscopic procedures. The pivotal issue of surgical techniques always point out to the surgeons' experience with particular surgical technique.

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## IMAGING

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### **Ultrasound assessment of intravesical prostatic protrusion and detrusor wall thickness--new standards for noninvasive bladder outlet obstruction diagnosis?**

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J Urol. 2010; 183: 2270-4

**Purpose:** We evaluated the accuracy of detrusor wall thickness and intravesical prostatic protrusion, and the association of each test to diagnose bladder prostatic obstruction in patients with lower urinary tract symptoms. **Materials and Methods:** We enrolled in the study 100 consecutive patients with lower urinary tract symptoms due to benign prostatic hyperplasia. Baseline parameters were International Prostate Symptom Score, prostate volume, urinary flow rate, intravesical prostatic protrusion, detrusor wall thickness, Schaefer obstruction class, minimal urethral opening pressure and the urethral resistance algorithm bladder outlet obstruction index. A ROC curve was produced to calculate AUC and evaluate the diagnostic performance of intravesical prostatic protrusion, detrusor wall thickness and prostate volume for bladder prostatic obstruction.

**Results:** We noted a highly significant correlation between intravesical prostatic protrusion and the bladder outlet obstruction index (Spearman's  $\rho = 0.49$ ,  $p = 0.001$ ), and Schaefer obstruction class (Spearman's  $\rho = 0.51$ ,  $p = 0.001$ ). A highly significant correlation was also observed for detrusor wall thickness and the bladder outlet obstruction index (Spearman's  $\rho = 0.57$ ,  $p = 0.001$ ), detrusor wall thickness and Schaefer obstruction class (Spearman's  $\rho = 0.432$ ,  $p = 0.02$ ). On multivariate analysis intravesical prostatic protrusion and detrusor wall thickness were the only parameters associated with bladder prostatic obstruction ( $p = 0.015$ ). The AUC for intravesical prostatic protrusion was 0.835 (95% CI 0.756-0.915) and for detrusor wall thickness it was 0.845 (95% CI 0.78-0.91). The association of intravesical prostatic protrusion and detrusor wall thickness produced the best diagnostic accuracy (87%) when the 2 tests were done consecutively.

**Conclusions:** Suprapubic ultrasound of detrusor wall thickness and intravesical prostatic protrusion is a simple, noninvasive, accurate system to assess bladder prostatic obstruction in patients with lower urinary tract symptoms due to benign prostatic hyperplasia.

### **Editorial Comment**

Recently attempts have been made to provide noninvasive tests for the assessment of bladder outlet obstruction (BOO). Since prostate volume and post void residual urine are not accurate parameters in predict-

ing BOO, the positive predict value of others sonographic measurements such detrusor wall thickness (DWT), bladder weight and intravesical prostatic protrusion (IPP) has been investigated. In this study the authors evaluated a group of 100 patients with lower urinary tract symptoms due to benign prostatic hyperplasia. They found that the AUC for IPP was 0.835 with a cutoff of 12 mm having 0.65 sensitivity and 0.77 specificity and 88% positive predictive value. The AUC for DWT was 0.845 and at a 6 mm cutoff they noted 0.73 sensitivity and 0.82 specificity. Patients with 1 of the 2 tests positive (IPP 12 mm or more, or DWT 7 mm or more) have an approximately 90% chance of bladder prostatic obstruction on pressure flow study. In the evaluation of IPP, the authors excluded men with a median lobe, which may cause ball valve type of obstruction and can be easily determined by suprapubic US in the sagittal plane. Special attention was given to the role of protrusion of lateral lobes into the bladder. Radiologists and urologists, who perform urological ultrasound, should be aware of the technical aspects of how to obtain these measurements. The estimative of DWT, is yet the only one of these two parameters which has been recommended by the “American College of Radiology 2008 - Appropriateness Criteria”, requires adequate maximum bladder volume, adequate place of the transducer for bladder wall measurement and optimized ultrasound transducer frequency.

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### **Renal cell carcinoma: diffusion-weighted MR imaging for subtype differentiation at 3.0 T**

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Radiology. 2010; 257: 135-43

**Purpose:** To assess the usefulness of apparent diffusion coefficients (ADCs) for characterizing renal cell carcinoma (RCC) subtypes at 3.0 T.

**Materials and Methods:** The Institutional Review Board approved this retrospective study, and informed consent was waived. Eighty-three patients underwent diffusion-weighted (DW) magnetic resonance (MR) imaging of 85 renal masses. In each patient, precontrast single-shot spin-echo echo-planar DW imaging was performed with b values of 0 and 500 and 0 and 800 sec/mm<sup>2</sup> by using a 3.0-T MR imaging system. Differences in ADCs between the RCC lesions and uninvolved renal parenchyma were tested by using a paired-samples t test. One-way analysis of variance was used to compare ADCs of the various RCC subtypes. Receiver operating characteristic (ROC) curve analysis was used to test the ability of ADCs in differentiating clear cell from non-clear cell RCCs.

**Results:** Pathologic diagnoses of the 85 tumors (median diameter, 4.4 cm) in the 83 patients (54 men, 29 women; age range, 23-75 years; mean age, 49.4 years) were clear cell RCC for 49 tumors, papillary RCC for 22 tumors, and chromophobic RCC for 14 tumors. With b values of 0 and 500 sec/mm<sup>2</sup>, clear cell RCCs showed a significantly higher mean ADC ( $1.849 \times 10^{-3}$  mm<sup>2</sup>/sec) than papillary ( $1.087 \times 10^{-3}$  mm<sup>2</sup>/sec) and chromophobic ( $1.307 \times 10^{-3}$  mm<sup>2</sup>/sec) RCCs ( $P < .001$ ); however, the difference between papillary and chromophobic RCCs was not significant ( $P = .068$ ). With b values of 0 and 800 sec/mm<sup>2</sup>, clear cell RCC showed the largest mean ADC ( $1.698 \times 10^{-3}$  mm<sup>2</sup>/sec) of the three subtypes, and the difference between each pair of

subtypes was significant ( $P < .001$ ). ADCs obtained with b values of 0 and 800 sec/mm<sup>2</sup> were more effective for distinguishing clear cell from non-clear cell RCC (area under the ROC curve, 0.973): A threshold value of  $1.281 \times 10^{-3}$  mm<sup>2</sup>/sec permitted distinction with high sensitivity (95.9%) and specificity (94.4%).

Conclusion: DW imaging with b values of 0 and 800 sec/mm<sup>2</sup> allows sensitive and specific differentiation of clear cell, papillary, and chromophobic RCCs, suggesting that DW imaging may be useful in the preoperative characterization of RCC.

### Editorial Comment

Diffusion-weighted imaging (DWI) is a magnetic resonance technique where the contrast between tissues derives from the regional differences in the mobility of water molecules. The diffusion data can be presented as signal intensity on pure DWI or as an image map of the apparent diffusion coefficient (ADC). Calculation of the ADC requires 2 or more acquisitions with different diffusion weightings (“b values”). A low ADC corresponds to high signal intensity in pure DWI (restricted diffusion usually found in more compact tissues), and a high ADC to low signal intensity on pure DWI (found in less compact tissue). The authors of this study evaluated with DWI 85 tumors (49 clear cells RCC, 22 papillary RCC and 14 chromophobic RCC. ADCs obtained with b values of 0 and 800 sec/mm<sup>2</sup>, were more effective for distinguishing clear cell from non-clear cell RCC (area under the ROC curve, 0.973), and for distinguishing RCC sub types.

DWI has also been shown to be useful to distinguish benign from malignant renal tumors (1). Statistically significant differences exist between the ADC values of normal kidney, renal carcinomas, renal angiomyolipomas and renal cysts when the “b value” is the same. In our opinion however further studies are necessary to confirm the reported higher accuracy in distinguishing benign from malignant renal tumors and in distinguishing RCC subtypes. Until now, there is no consensus regarding which are the best “b values” for renal masses characterization. Do we need just a pair of b values (example: 0 and 800 sec/mm<sup>2</sup>) or do we need a multi-b-values technique (example: b values of 0, 50, 100, 300, 500, 800, 1000, etc) in order to obtain a discriminatory characteristic curve of ADC values?. Another point to consider is that in the majority of situations, radiologists use only visual assessment of DWI; in other words normal or benign, less compact tissues, usually present as an area with lower signal intensity on DWI and with higher ADC values. Contrary, tumoral compact tissue, due its restricted diffusion, appears as an area with higher signal intensity on DWI and lower ADC values. However in our preliminary experience we have been seen benign angiomyolipoma with lower ADC values than RCC.

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## PATHOLOGY

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**Skeletal muscle involvement by limited Gleason score 6 adenocarcinoma of the prostate on needle biopsy is not associated with adverse findings at radical prostatectomy**

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J Urol. 2010; 184: 2308-12

**Purpose:** Skeletal muscle involvement by prostate cancer is considered to be ambiguous for extraprostatic extension when it is found at the apex, where benign prostatic glands naturally blend with the skeletal muscle of the rhabdosphincter. We investigated the significance of skeletal muscle involvement by cancer in needle biopsies in predicting adverse outcomes at radical prostatectomy.

**Materials and Methods:** From 2000 to 2009, we retrospectively identified 40 cases with Gleason score 6 adenocarcinoma involving up to 20% of 1 core, with skeletal muscle involvement. Outcomes of radical prostatectomy were compared with a control group of 82 cases with the same parameters without skeletal muscle involvement from the same period.

**Results:** In radical prostatectomy specimens Gleason score greater than 6, extraprostatic extension and positive margins were found in 15.0%, 7.5% and 12.5% of patients in the study group, compared to 20.7%, 11.0% and 4.9% of patients in the control group, respectively. No statistically significant differences were found between cases with or without skeletal muscle involvement on needle biopsy. The apical margin was the only positive margin in 4 of 5 study group cases with positive margins. In contrast, positive margins were randomly distributed in the control group.

**Conclusions:** Limited cancer involvement of skeletal muscle in biopsy specimens should not be used as a contraindication for radical prostatectomy for otherwise resectable prostate cancer as most patients have organ confined disease and negative margins. However, care must be taken during division of the dorsal vein complex to avoid a positive margin on the anterior apex of the prostate.

**Editorial Comment**

The histology of normal prostate glands consists of epithelial cells and stromal cells. The epithelial cells are: a) urothelial (transitional cells) in the distal portion of the ducts; b) secretory and basal cells in ducts and acini; and c) endocrine cells. In the compartment of the basal cells are located prostate stem cells. By asymmetric division these cells have the ability to self-renew and give rise intermediate (or transiently amplifying cells) that rapidly regenerate and give rise to fully differentiated secretory cells (1). In some pathologic conditions, like prostatic atrophy, it is considered that the secretory compartment presents only intermediate (or transiently amplifying cells) (2).

The stromal cells are smooth muscle cells, fibroblasts, nerves, and endothelial cells. In cases of adenocarcinoma of the prostate with stromal reaction (desmoplasia) the stroma shows myofibroblasts (3).

In the most distal (apical) portion of the prostate gland, skeletal fibers of the urogenital diaphragm extend into the prostate. The pathologist must be aware of this fact in order to avoid misinterpret neoplastic acini among skeletal muscle cells as extraprostatic extension.

The study from Johns Hopkins showed that limited cancer involvement of skeletal muscle in biopsy specimens should not be used as a contraindication for radical prostatectomy for otherwise resectable prostate cancer as most patients have organ confined disease and negative margins. However, as an alert to the surgeon,

care must be taken during division of the dorsal vein complex to avoid a positive margin on the anterior apex of the prostate.

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#### **The plasmacytoid carcinoma of the bladder - rare variant of aggressive urothelial carcinoma**

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*Int J Cancer*. 2010; 28. [Epub ahead of print]

The WHO classification of 2004 defines new histological and molecular variants of urothelial carcinoma. However there are limited data available on the clinico-pathological characteristics or prognosis of these variants. We present histopathological, molecular and clinical data of 32 plasmacytoid carcinomas of the bladder (PUC) showing that PUC is a high-grade tumor with molecular features of aggressive urothelial carcinoma, usually diagnosed in advanced pathological stage (64% pT3, 23% pT4) showing metastases in 60 % of the patients. Average survival of our cohort of PUC treated with radical cystectomy and adjuvant chemotherapy was lower than what is typically seen for comparable conventional urothelial carcinomas. 87% of the PUCs showed a negative or strongly reduced membranous staining of E-cadherin. Beta-catenin staining was negative in 22.5% and 16.7% of the remaining tumors showed nuclear accumulation. Aberrant CK20 expression (negative or > 10% of cells stained) and negative CK7 staining was found in 100% and 22.6%, respectively. 97% revealed positive staining for PAN-CK. CD138 was positive in 78 %, whereas MUM-1 expression was negative in all cases. Multi-target fluorescence in situ hybridization showed all PUCs to be highly aneuploid and polysomic. Deletions on chromosome 9p21 seem to play an important role in this variant. FGFR3 and PIK3CA mutation analyses yielded no mutations in any of the PUCs analyzed. TP53 mutation analysis showed mutations in 29%. In summary, PUC is a aggressive variant of bladder cancer with molecular features of advanced bladder cancer and evidence of WNT pathway activation in some of the cases.

#### **Editorial Comment**

The great majority of urinary bladder neoplasms derive from the urothelial (transitional) cells. Tumors originating from the mesenchymal cells are rare. The most common tumors are benign or malignant conventional urothelial neoplasms.

The World Health Organization has expanded the microscopic forms of urothelial carcinomas to include several unusual histological variants. The importance of the recognition of these unusual forms is related to: a) different prognosis; b) different therapeutic approach; and, c) the possibility of misinterpretation by the pathologist.

An important example is the small cell carcinoma with neuroendocrine differentiation. The importance of an accurate diagnosis of this variant of urothelial carcinoma is its response to newer chemotherapy protocols. The histological variants of urothelial carcinoma includes: nested variant, urothelial carcinoma with small tubules, microcystic urothelial carcinoma, micropapillary variant, lymphepithelioma-like, sarcomatoid carcinoma (carcinosarcoma), small cell carcinoma, plasmacytoid carcinoma, urothelial carcinoma with rhabdoid features, urothelial carcinoma with clear cytoplasm (glycogen-rich), urothelial carcinoma with trophoblastic differentiation, urothelial carcinoma with unusual stromal reactions, osteoclast-rich undifferentiated carcinoma, and giant cell carcinoma (1).

The study by Keck et al. based on a large series of plasmacytoid carcinoma showed that this tumor is an aggressive variant of bladder cancer with molecular features of advanced bladder cancer and evidence of WNT pathway activation in some of the cases.

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## RECONSTRUCTIVE UROLOGY

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### **Volar onlay urethroplasty for reconstruction of female urethra in recurrent stricture disease**

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**Objective:** To report our experience with a new and simple method of urethral repair with a volar onlay of free labium minus graft. Strictures of the female urethra are rare, and it is well accepted that the therapeutic options of dilation and urethrotomy are not lasting solutions as a result of their high recurrence rates. However, there is no consensus regarding the best way to reconstruct the female urethra in the case of stricture disease.

**Patients and Methods:** Four consecutive female patients with a long lasting history of recurrent urethral strictures underwent open urethroplasty with a volar situated free split thickness epidermal graft from the labium minus. The surgical technique is described and a short-term follow-up is presented.

Results: Operating time was 40–140 min (mean 105 min), and the graft measured between  $2 \times 1.5$  cm and  $3 \times 2.5$  cm. Follow-up time was 11–19 months. Maximum urinary flow rate could be improved from a baseline of 9.4–11.2 mL/s (preoperatively, after intermittent use of dilation) to 19–23 mL/s. Postvoid residual urine volume was 0–50 mL preoperatively and no postvoid residual urine volume postoperatively. Urinary catheters were removed after 21 days. Urinary stress incontinence did not occur postoperatively. There were found no complications related to the graft donor site.

Conclusions: The reported data concerning a new therapeutic approach for the treatment of recurrent female urethral stricture show that a volar onlay urethroplasty represents a feasible, safe and simple surgical method. Larger series with long-term follow-up are needed for further evaluation.

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### **Vaginal flap urethroplasty for wide female stricture disease**

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Purpose: As in men, female urethral stricture disease is often treated with repeat urethral dilation or internal urethrotomy but not always with good results. In nonresponsive cases surgical treatment may be useful but only a few cases are reported in the literature. We present our single institution experience with urethral reconstruction in 6 patients using an alternative vaginal inlay flap technique inspired by the Orandi technique.

Materials and Methods: We treated 6 women with urethral stricture. In 5 patients stricture involved the entire middle and distal urethra, and in 1 it also involved the proximal urethra with bilateral hydronephrosis. Patients underwent urethral reconstruction using a vaginal flap with a lateral vascular pedicle that maintains the vascular axis. The flap was partially de-epithelialized to favor tissue cicatrix formation where the sutures are placed and avoid fistula formation.

Results: Mean followup was 70.8 months. Normal micturition was achieved after catheter removal in all patients. Post-void residual urine was measured postoperatively in 3 patients. One patient had significant post-void residual urine and required intermittent self-catheterization. The remaining 5 patients required no additional treatment.

Conclusions: Using the vaginal wall to reconstruct large segments of the female urethra is simple and appears to have good results. Our technique preserves the vascular axis of the flap and protects the sutures. More contributions to the existing literature are needed before any further conclusions can be drawn.

### **Editorial Comment**

Repair of female urethral stricture disease is difficult. First, the disease is less common than male urethral stricture disease making the surgeon less familiar with the technique. Second, the shorter urethra and proximity to the vaginal mucosa allows for little margin of error. Perhaps the multitude of surgical approaches described attests to the quest to find a universally acceptable approach. Dividing the urethra along its volar aspect (the vaginal rather than clitoral body side) is preferable for many reasons. First, it avoids the majority of the sphincter fibers. These fibers follow an omega shape and are more prominent on the clitoral side. Second, a volar dissection is familiar to most urologists as the dissection for most anti-incontinence procedures is done in this area. Third, it avoids dissection of the urethra off the clitoral bodies – a dissection unfamiliar to urologists.

These two articles present descriptions of modifications of the volar urethroplasty in women. In Gozzi et al, the authors describe a suburethral incision followed by dissection of the vaginal flap off the urethra, a

volar urethrotomy and excision of all scarred tissue. A labia minora graft is then harvested, thinned, and grafted ventrally, using the periurethral tissue as a graft bed. The vaginal flap is closed. In contrast, the Simonato et al group describes an approach that borrows heavily from the Orandi urethroplasty well-known in reconstruction of penile urethral stricture disease. A laterally-based vaginal flap is created and the middle portion is de-epithelialized. This essentially creates a medially located island flap which is then rolled onto the ventral urethrotomy. The remaining (lateral) vaginal flap is closed over the urethra.

Both of these approaches are attractive in the fact that they use a volar approach and borrow from reconstructive principles used in male urethral stricture surgery. Both approaches are most appropriate in the distal to middle third of the urethra. The proximal third remains a higher risk area due to the deeper dissection and the prominence of bladder neck sphincter fibers. Small patient numbers and limited follow-up may limit the external validity of the results of these two series.

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## UROLOGICAL ONCOLOGY

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### **Clinical outcome in a contemporary series of restaged patients with clinical T1 bladder cancer**

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*Eur. Urol. 2009; 56: 903-910*

**Objectives:** To evaluate the indications for early and deferred cystectomy and to report the impact of this tailored approach on survival.

**Design, Setting, and Participants:** We retrospectively studied 523 patients seen at our institution who were initially diagnosed with T1 disease between 1990 and 2007.

**Measurements:** Variables analyzed included age, gender, multifocality, multifocal T1 disease, carcinoma in situ, grade, recurrence rate, and restaging status. End points were overall and disease-specific survival.

**Results and Limitations:** A restaging transurethral resection (TUR) was performed in 523 patients. Of the patients who underwent restaging, 106 (20%) were upstaged to muscle-invasive disease and 417 patients were considered true clinical T1 (cT1); 84 of the latter group underwent immediate cystectomy. The median follow-up for survivors was 4.3 yr. The cumulative incidence of disease-specific death at 5 yr was 8% (95% confidence interval [CI], 5-13%), 10% (95% CI, 5-17%), and 44% (95% CI, 35-56%) for those restaged with lower than T1, T1, and T2 disease, respectively. Immediate cystectomy was more likely in patients with cT1 disease at restaging than in those with disease lower than cT1, but there were no other obvious differences in clinical characteristics between those with and without immediate cystectomy. Survival was not statistically different for patients who underwent an immediate cystectomy versus those who were maintained on surveillance with deferred cystectomy if deemed appropriate. Of 333 patients who did not undergo immediate cystectomy, 59 had a deferred cystectomy, and the likelihood of deferred cystectomy was greater in those with T1 disease on restaging TUR (hazard ratio: 2.40; 95% CI, 1.43-4.01; p=0.001).

Conclusions: Restaging TUR should be performed in patients diagnosed with cT1 bladder cancer to improve staging accuracy. Patients with T1 disease on restaging are at higher risk of progression and should be considered for early cystectomy.

### Editorial Comment

The timing of cystectomy in T1 bladder cancer is a matter of debate since years. Here, the authors from a tertiary referral center present their series of 523 patients and analyze variables which may help with the decision to remain conservatively, or proceed with radical surgical therapy. Interestingly, re-TUR was performed in all patients and yielded a high rate of 20% upstaging to muscle-invasive disease. If true T1 was considered, the disease-specific mortality at 5 years was 10%, with no survival differences between those patients undergoing early cystectomy versus those with no or deferred cystectomy. Clearly, these data support an initial conservative approach in select patient with true pT1. In any case, a re-TUR is mandatory.

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### **Outcome predictors of radical prostatectomy in patients with prostate-specific antigen greater than 20 ng/ml: A European multi-institutional study of 712 patients**

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*Eur. Urol. 58: 1-7, 2010*

Background: Prostate cancer (PCa) patients with pretreatment prostate-specific antigen (PSA) >20 ng/ml have a high risk of biochemical and clinical failure and even cancer-related death after local therapy. Pretreatment predictors of outcome after radical prostatectomy (RP) in this patient group are necessary.

Objective: Our aim was to assess how the use of additional high-risk factors (biopsy Gleason score [bGS]  $\geq 8$  or clinical stage 3-4) can improve prediction of treatment failure and cancer-related death after RP in patients with PSA >20.

Design, Setting, and Participants: In a retrospective multicentre cohort study from six European centres between 1987 and 2005, 712 patients with PSA >20 ng/ml underwent RP and bilateral pelvic lymphadenectomy.

Measurements: Subgroups were analysed to determine the relationship between the number of high-risk factors and histopathology, biochemical progression-free survival, clinical evidence of progressive disease, prostate cancer-specific mortality (PCSM), and overall mortality. Kaplan-Meier analysis with log-rank test and Cox multivariable analysis were applied.

Results and Limitations: Median follow-up was 77 mo. The number of high-risk factors was significantly associated with unfavourable histopathology. Among patients with only PSA >20 ng/ml, 33% had pT2 PCa, 57.9% had bGS <7, 54% had negative surgical margins, and 85% were lymph node negative (pN0), whereas among patients with all three high-risk factors, 4.5% had pT2 PCa, 2.3% had bGS <7, 20.5% had negative margins,

and 49% were pN0 ( $p < 0.001$ ). The strongest predictor of progression and mortality was bGS. PSA  $> 20$  ng/ml associated with bGS  $\leq 7$  resulted in 10-yr PCSM of 5%; when associated with bGS  $\geq 8$ , PCSM was 35%. The main limitations of the study were retrospective design and varying treatment modalities.

Conclusions: PCa patients with PSA  $> 20$  ng/ml have varying risk levels of disease progression and PCSM. Considering additional risk factors further stratifies this group into four subgroups that can guide the clinician in preoperative patient counselling.

### Editorial Comment

Surgical therapy in patients with prostate cancer and a PSA  $> 20$  ng/ml is a matter of debate. Most patients are considered high-risk and receive either hormonal therapy alone or are referred to external beam radiation therapy. The authors from this multi-institutional study analyze their 712 patients with PSA  $> 20$  ng/ml who underwent radical prostatectomy. Of this group, roughly 40% had Gleason score  $> 7$ , 50% had positive surgical margins and 15% were node-positive. The combination of these factors was predictive for patient's outcome.

Interestingly, even in this special group of patients death of disease was a rare event, with high cancer-specific survival rates of 90% and 85% after 5 and 10 years, respectively, whereas biochemical progression-free rates in the same group were as low as 65% at 5 years and 52% at 10 years.

The combination of several risk factors, expectedly, led to reduced progression-free and survival rates. In summary, radical prostatectomy is a viable option even for high-risk patients.

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## NEUROLOGY & FEMALE UROLOGY

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### **Functional results after tape removal for chronic pelvic pain following tension-free vaginal tape or transobturator tape**

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*J Urol. 2010; 184: 610-5*

**Purpose:** The incidence of pelvic pain after placement of a suburethral sling for incontinence ranges between 0% and 30%. The management of this chronic pain after suburethral sling placement is complex and to our knowledge no consensus has been reached. We evaluated the functional results after removal of the suburethral tape responsible for chronic pelvic pain.

**Materials and Methods:** From November 2004 to August 2009, 32 patients undergoing removal of suburethral tape causing chronic pelvic and perineal pain at our department were prospectively followed. Patients were divided according to the type of suburethral sling into the transobturator tape group (15 patients) and the tension-free vaginal (retropubic) tape group (17 patients). In the TVT group tape removal was performed using

transperitoneal laparoscopy in every patient. In the TOT group tape removal was performed via a transvaginal approach possibly associated with a unilateral or bilateral incision in the proximal part of the thigh. Pain was evaluated by a visual analogue scale from 0-no pain to 10-maximal pain.

Results: The surgical exploration of suburethral tape responsible for chronic, treatment refractory pelvic pain revealed in most cases an abnormal tape position or excessive tape traction. In the overall population tape removal provided improvement of pain (at least 50% improvement of the visual analogue scale score) in 68% with a mean followup of 10 months. Mean visual analogue scale score was 7.3 +/- 1.5 before surgery and 3.4 +/- 3 after surgery. However, recurrence of incontinence was observed in 22% of cases. No significant difference was demonstrated in terms of functional results according to the type of tape insertion.

Conclusions: The surgical removal of suburethral tape improved pain in 68% of patients but with a risk of recurrence of urinary incontinence in 22%.

### Editorial Comment

The authors review their experience in addressing chronic pelvic pain following the placement of a tension free vaginal tape or transobturator tape. Notable findings included that only approximately two-thirds of the patients were able to have a > 50% improvement in their pain control with resection of the tape. In addition, 1 in 5 patients had a return of their incontinence.

The physicians noted that the onset of pain after the placement of the tape was exceedingly rapid thus assisting the reader in linking the rapid temporal nature of this iatrogenic pain to the surgery. Of interest, is that cystoscopy, CT scan, and MRI's were all normal and thus are of potentially little assistance in evaluating this pain syndrome. For the TVT tapes, the authors utilized laparoscopy while for anatomic reasons with the transobturator tape, removals were performed transvaginally. Upon examination of the cause of pain with the TOT tape, it was noted that this was most likely to be secondary to a myofascial syndrome from muscle response to the tape passing through the body of the muscle.

Important take home messages include that the rapid appearance of pain after the placement of a suburethral tape should embolden the surgeon to promptly proceed with removal prior to the period of tissue ingrowth and that imaging studies with this temporal associated pain are of limited value. That the authors found that they had approximately 20% recurrence of incontinence after tape removal is understandable in view of similar findings of a very similar incontinence rate after simple sling incision for relief of urinary retention following pubovaginal slings (1). Strong consideration for long term physical therapy may be of value in view of the identified myofascial component and the less than 100% response to surgery for the pain.

### Reference

1. Thiel DD, Pettit PD, McClellan WT, Petrou SP: Long-term urinary continence rates after simple sling incision for relief of urinary retention following fascia lata pubovaginal slings. J Urol. 2005; 174: 1878-81.

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## **Outcomes of patients lost to followup after mid urethral synthetic slings--successes or failures?**

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*J Urol. 2010; 183: 1455-8*

**Purpose:** We classified patients lost to follow-up after mid urethral synthetic sling placement as examples of treatment success or failure based on the Patient Global Impression of Improvement, and compared the outcomes of those who followed up to the outcomes of those who did not.

**Materials and Methods:** We reviewed the charts of 217 patients who underwent mid urethral synthetic sling placement. Telephone interviews including the Patient Global Impression of Improvement and the Medical, Epidemiological, and Social Aspects of Aging questionnaires were conducted for patients lacking 3-month follow-up.

**Results:** Based on the Patient Global Impression of Improvement of the 48 patients who responded 13 (27.1%) were failures. The overall failure rate of patients with at least 3-month follow-up was 19% (23 of 124).

**Conclusions:** In our study success rates for patients lost to follow-up were similar to the rates for those who had routine follow-up. However, it is uncertain if these data can be applied to other study populations, especially in a randomized controlled trial.

### **Editorial Comment**

Notable experts in the field address the question of “what is the status of women who were lost to follow-up after their mid urethral sling surgery?”. They classified “lost to follow-up” as patients who did not return for their 3 months post operative appointments. Those patients lost to follow up, when identified and contacted, appeared to have very similar results to those patients who were able to be followed. The authors note the utility of the PGI-I one item questionnaire when assessing patients post-operatively after therapy for stress urinary incontinence. The paper did note that even when trying to contact all the patients lost to follow-up, there still remained a small population of patients who could not be contacted thus were truly lost to follow-up. It seems that not all lost to follow-up patients are failures or successes; even with including that truly lost to follow-up population, those patients who did not report for their postoperative follow-up have very similar outcomes to those who did thus potentially aiding analysis of future post sling reports.

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**Pelvic reduction during pyeloplasty for antenatal hydronephrosis: does it affect outcome in ultrasound and nuclear scan postoperatively?**

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**Objective:** To compare ultrasound (US) scan and nuclear renography findings in patients who underwent pyeloplasty with and without pelvic reduction in a randomized prospective study.

**Methods:** A total of 42 patients, all prenatally diagnosed with unilateral hydronephrosis, were included. Hydronephrosis was confirmed postnatally. Twenty patients were randomly selected to undergo pyeloplasty with pelvic reduction and 22 underwent pelvis-sparing pyeloplasty. Patients were evaluated with mercaptoacetyltriglycine-3 scans on the sixth month and US scans on the first, third, and sixth months, postoperatively. Mean follow-up was 37 +/- 5.6 weeks. Statistical analyses were performed using chi-square test and significance was set as  $P < .05$ . Power analyses were performed by the NCSS-PASS program. Power value of 0.84 was calculated for a sample size of 42.

**Results:** The anteroposterior pelvic diameter decreased significantly in the pelvic reduction group compared with pelvis-sparing group in the first- and third-month US scans. However, the difference was not significant in the sixth month. The improvements in the US findings for the pelvis-sparing group match with those of the pelvic reduction group later in the postoperative period. Pelvic reduction significantly improved the renal washout time ( $T(1/2)$ ) in mercaptoacetyltriglycine-3 renography when compared with pyeloplasty group without reduction at postoperative sixth month. Differential renal function was found to be unaffected from pelvic reduction.

**Conclusions:** Resolution of anteroposterior diameter in US scan is more prominent in the pelvic reduction group at earlier stages of the postoperative period. Although  $T(1/2)$  decreases more prominently in the pelvic reduction group, the utility of this procedure is still indecisive. This feature can reveal possible surgical failures earlier and strengthen the values of US and renography postoperatively.

**Editorial Comment**

This study is a prospective randomized trial looking at the effects of performing pelvic reduction during pyeloplasty. The authors used patients who had been antenatally diagnosed with unilateral hydronephrosis. Patients who demonstrated declining function in the hydronephrotic kidney with increasing pelvic dilation were recommended for pyeloplasty. They then randomized these patients to undergo either pelvic reduction at the time of pyeloplasty or not. They performed ultrasound at one, three, and six months postoperatively and repeated a MAG-3 diuretic renal scan at six months. They found a significant improvement in the degree of dilation in the pelvic reduction group at one and three months. However, at six months there was no significant difference between the two groups. Postoperative renal scans showed improved washout times in the pelvic reduction group although the authors point out that renal scans are unreliable indicators of obstruction. There was no difference in differential function at 6 months.

This study confirms the results of several other retrospective series suggesting that pelvic reduction is not necessary. What makes this study unique is that the patients were randomized in a prospective manner and followed according to a set protocol. In addition, this is a well-controlled population of infants at a mean of just over one year of age. For those who still favor pelvic reduction, the results suggest that persistent or worsening hydronephrosis on ultrasound following pelvic reduction might be a more worrisome sign of failure

in the early post-operative period. It would certainly be interesting to see a follow-up study of these patients in another year or two to evaluate any changes in differential function of the kidneys over time.

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### **Is staging beneficial for Fowler-Stephens orchiopexy? A systematic review**

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**Purpose:** Fowler and Stephens showed that by dividing the spermatic vessels a high intra-abdominal testis could be placed in the scrotum. Testicular atrophy is a potential complication of this technique. We conducted a systematic review to determine whether single or 2-stage Fowler-Stephens orchiopexy results in better testicular viability.

**Materials and Methods:** We searched electronic databases, clinical trial registries and gray literature. We included reports describing boys younger than 18 years with a primary outcome of “testicular viability and position.” We performed a meta-analysis using random effects models. Heterogeneity was assessed using forest plot and I(2) statistic.

**Results:** We identified 1,807 citations and included 61 articles. Single stage Fowler-Stephens orchiopexy was discussed in 9 articles, a 2-stage procedure in 36 and both approaches in 16. There were no randomized controlled trials, and most studies were cohort or case series. The pooled estimate of success rates was 80% for single stage Fowler-Stephens orchiopexy (95% CI 75 to 86) and 85% for 2-stage Fowler-Stephens orchiopexy (95% CI 81 to 90). The pooled odds ratio of single stage vs 2-stage Fowler-Stephens orchiopexy was 2.0 (95% CI 1.1 to 3.9) favoring the 2-stage procedure. There was no difference in the success rate between laparoscopic and open techniques in either single or 2-stage Fowler-Stephens orchiopexy. There was no evidence of asymmetry on the funnel plot. There were no complications reported with single stage, while ileus, hematoma and infection were the most common complications with 2-stage Fowler-Stephens orchiopexy.

**Conclusions:** Both techniques have a fairly high success rate but 2-stage Fowler-Stephens orchiopexy appears to carry a higher rate of success than the single stage approach (85% vs 80%, OR 2 in favor of 2-stage). Laparoscopic and open techniques had the same success rate. However, the level of evidence of the studies was low, and a study of a more robust design, such as a randomized controlled trial, should be performed.

### **Editorial Comment**

This study is a meta-analysis of the English literature regarding Fowler-Stephens orchiopexy. The authors sought to determine if either a one-stage or a two-stage procedure had better outcomes. Out of over 1,800 citations they were able to include 61 articles. As one might imagine, there were no randomized controlled trials and the overall quality of these studies was average. Despite this, the statistical analysis demonstrated a slight advantage to a staged Fowler-Stephens orchiopexy with a success rate of 85% versus an 80% success rate in the single stage

procedure. There was no significant difference noted between laparoscopic or open repair for either a single stage or a staged Fowler-Stephens orchiopexy. Those studies that looked at both a one-stage versus two-stage Fowler-Stephens orchiopexy were pooled together and favored a two-stage procedure with an odds ratio of 2, although the numbers in many of these studies were quite small.

Although the strength of the data in this metaanalysis is not particularly strong it certainly favors a two-stage approach for these patients. Location of the testis and anatomy of the vas and vessels will vary from patient to patient. In addition, surgeon experience and comfort level with each of these procedures has to be taken into account. Having said that, however, this meta-analysis of the available literature gives the advantage to a staged procedure.

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