
UROLOGICAL SURVEY

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STONE DISEASE

A prospective randomized controlled trial on ureteral stenting after ureteroscopic holmium laser lithotripsy

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J Urol. 2003; 169: 1257-60

Purpose: A prospective randomized controlled trial was conducted to evaluate whether postoperative ureteral stenting is necessary after ureteroscopic laser lithotripsy. **Materials and Methods:** A total of 58 patients with unilateral ureteral stones were randomized into either stented or unstented groups. Ureteroscopic laser lithotripsy was performed using a semirigid ureteroscope (6.5 / 7Fr) and holmium laser without ureteral orifice dilation. There were no selection criteria regarding stone size, location, preoperative ureteral obstruction and hydronephrosis. Endoscopic evidence of stone impaction or mucosal edema/damage did not exclude a patient from the study. Ureteral perforation on completion retrograde pyelogram was the only intraoperative criterion for study exclusion. Postoperative pain scores and symptoms were recorded. Excretory urography was performed to document stone-free status and stricture formation. Radionuclide scan was performed selectively to exclude functional obstruction when ureteral narrowing was found on excretory urogram.

Results: Mean stone size +/- SD was 9.7 +/- 4.0 mm. (range 4 to 27). Proximal ureteral stones accounted for 43% of all stones. Stented and unstented groups were comparable with respect to demographic data, stone parameters, preoperative obstruction and hydronephrosis. There was no significant difference in operating time, laser energy used, stone impaction and mucosal edema/damage between the 2 groups. Postoperative pain and symptoms were more severe and frequent ($p < 0.05$) in the stented group. However, there was no difference in the incidence of postoperative sepsis and unplanned medical visits. The stone-free and stricture formation rates showed no statistical difference between the 2 groups.

Conclusions: Ureteral stenting is not necessary after uncomplicated ureteroscopic laser lithotripsy for ureteral stones. Ureteral stent increases the incidence of pain and urinary symptoms but does not prevent postoperative urinary sepsis and unplanned medical visits. Severity of preoperative obstruction and intraoperative ureteral trauma were not shown to be determining factors for stenting.

Editorial Comment

Historically, placement of a ureteral stent after ureteroscopy for stone removal or fragmentation has been routine practice. However, recent retrospective studies and prospective, randomized trials have suggested that placement of a ureteral stent after uncomplicated ureteroscopy may be unnecessary and is associated with greater patient discomfort. The problem lies in what constitutes "uncomplicated". Some investigators restricted their series to distal ureteral calculi only. Others excluded patients requiring balloon dilation of the intramural ureter. Still others excluded patients in whom fragments were extracted after fragmentation, while others excluded patients in whom fragments were left behind! In all cases, it was left to the discretion of the surgeon to exclude patients in whom evidence of mucosal trauma or severe impaction were present. Thus, guidelines for selection of patients who may be safely left unstented are not clear-cut.

The authors of the present randomized trial excluded patients intraoperatively only if the stone was unable to be accessed, a concomitant ureteral stricture was present or a ureteral perforation occurred. Degree of pre-operative obstruction, stone impaction and ureteral trauma or edema did not constitute grounds for exclusion. Furthermore, middle and proximal ureteral stones comprised 59% and 28% of stones in the unstented and stented groups, respectively. Similar to other studies, the authors found no significant difference in stone free

rates, post-operative fever or urinary tract infection, or need for unplanned medical visits in the 2 groups. However, also in common with other studies, urinary symptoms were greater in the stented group compared with the unstented group. This study confirms the safety of stentless ureteroscopy after treatment of stones in all locations in the ureter, but also suggests that the appearance of the ureter after stone removal, provided a perforation has not occurred, is not a reliable indicator of ureteral obstruction post-operatively. Hopefully, with additional confirmation and further study, specific criteria for post-operative stenting can be provided. However, it should be kept in mind that in cases of questionable ureteral injury, placement of a ureteral stent will never be the wrong thing to do.

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Characterization of intrapelvic pressure during ureteropyeloscopy with ureteral access sheaths

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Objectives: To evaluate the impact of the ureteral access sheath on intrarenal pressures during flexible ureteroscopy in light of the recent resurgence in their use. As such, using human cadaveric kidneys, we studied changes in intrarenal pressure in response to continuous irrigation at different pressures with and without access sheaths of various sizes and lengths.

Methods: This study was performed using seven cadaveric kidneys. In three kidneys the study was done in situ with a 7.5F flexible ureteroscope (URS) passed by itself and then passed through a 10/12F sheath (35 and 55 cm in length), whereas, in four kidneys, due to narrowing of the intramural ureter, the study was done ex vivo using the unsheathed URS and then passing the 7.5F flexible URS via the 10/12F, 12/14F, and 14/16F sheaths (all 35 cm in length). A 10F Cope loop pyelostomy was placed to measure intrapelvic renal pressure. Three sets of 3-minute readings (i.e., flow and intrarenal pressure) were taken with the tip of the URS at the distal ureter, middle ureter, and renal pelvis (just above the ureteropelvic junction); the entire process was done at three different irrigant pressure settings: 50, 100, and 200 cm H₂O. Irrigant flow and intrarenal pressures were measured at all three settings using the URS passed without a sheath and then with the URS passed through the various sheaths positioned at the distal ureter, middle ureter, and renal pelvis.

Results: With all of the sheaths, intrapelvic pressure remained low (less than 30 cm H₂O), and there was a 35% to 80% increase in irrigant flow versus the control unsheathed URS. With the sheath in place, the majority of the irrigant drained alongside the URS and out the sheath. Flow and pressure with the 12/14F sheath were equivalent to the 14/16F sheath.

Conclusions: The 12/14F access sheath provides for maximum flow of irrigant while maintaining a low intrarenal pelvic pressure. Even with an irrigation pressure of 200 cm H₂O, renal pelvic pressure remained below 20 cm H₂O.

Editorial Comment

Ureteral access sheaths have long been available to facilitate access to the ureter and collecting system. However, a cumbersome design and the potential for ureteral perforation prevented the sheath from achieving

widespread use. Resurgence in interest in the access sheath occurred with advances in design that improved ease and safety of placement and reduced the tendency of the sheath to buckle. Although the ureteral access sheath has been used primarily to facilitate multiple entries and exits from the ureter and it has been proven advantageous in this regard from the standpoint of operative time and cost, Rehman and colleagues have shown that use of the access sheath is advantageous for physiologic reasons as well. Using a variety of sizes of access sheaths and irrigation pressures in a cadaveric model, these investigators demonstrated that renal pelvic pressure could be kept below 30 cm H₂O and irrigation flow could be improved by 35-80% compared to ureteroscopy without a sheath.

With an increase in the complexity of ureteroscopic procedures has come an increase in operative time. Furthermore, the treatment of larger stones and potentially infected stones has led to an increase in the potential for urinary extravasation and sepsis. The findings of this study suggest that use of a ureteral access sheath, particularly during lengthy ureteroscopic procedures for large renal or ureteral calculi may reduce intrarenal pressure, thereby reducing the likelihood of pyelovenous or pyelolymphatic backflow, as well as the chance of forniceal rupture, extravasation and sepsis, and also improve endoscopic visibility through increased irrigation flow. Particularly when treating a potentially infected stone, maintenance of as low an intrarenal pressure as possible is imperative in order to prevent sepsis. Consequently, use of an access sheath, even when there is no intention of frequent entries and exits from the ureter, may increase the safety of long ureteroscopic procedures.

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ENDOUROLOGY & LAPAROSCOPY

Aspiration and sclerotherapy versus hydrocelectomy for treatment of hydroceles

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Objectives: To compare aspiration and sclerotherapy using sodium tetradecylsulfate (STDS) with open hydrocelectomy in the treatment of hydroceles with regard to safety, efficacy, and cost-effectiveness.

Methods: Patients with symptomatic hydroceles were prospectively enrolled in an aspiration and sclerotherapy protocol between October 1998 and June 2000. Patients in this group underwent percutaneous aspiration followed by sclerotherapy with an STDS-based solution. This group was compared with a group of patients chosen consecutively who underwent hydrocelectomy between December 1996 and August 1999. Primary outcome measures included patient satisfaction and procedural success. Secondary outcome measures included complications and comparative costs.

Results: A total of 27 patients with 28 hydroceles were enrolled in the aspiration and sclerotherapy protocol and compared with 24 patients with 25 hydroceles in the hydrocelectomy group. Mean follow-up for the aspiration and sclerotherapy group and hydrocelectomy group was 8.9 and 16.4 months, respectively. Patient satisfaction was 75% for aspiration and sclerotherapy and 88% for hydrocelectomy. The overall success rate for aspiration and sclerotherapy was 76% compared with 84% for hydrocelectomy. The complication rate was only 8% in the aspiration and sclerotherapy group, but 40% in the hydrocelectomy group. Comparative costs

per procedure demonstrated that hydrocelectomy was almost ninefold more expensive than aspiration and sclerotherapy.

Conclusions: In the treatment of hydroceles, aspiration and sclerotherapy with STDS represents a minimally invasive approach that is simple, inexpensive, and safe but less effective than hydrocelectomy. Aspiration and sclerotherapy is a viable first-line therapeutic option in the management of hydroceles.

Editorial Comment

My experience with regards to surgical hydrocelectomy is similar to that reported by the authors. The complication rate is high and the limitation of patient activity for the first few weeks after the procedure can be significant. The same comments are echoed by my colleagues at the frequent presentation of hydrocele complications during our monthly Mortality and Morbidity Conference. Sclerosis would seem to be an attractive option. Beiko and associates used 4 ml of 3% STDS, 6 ml 2% lidocaine, and 140 ml of 5% dextrose in 0.45% normal saline (final concentration of 0.08% STDS), replacing 25% of the aspirated hydrocele volume. This is similar to the regimen used in another recent study (1). After draining the hydrocele completely, the sclerosing solution is left in place. Antibiotics but no analgesics are provided. In the discussion section of their article, Beiko and associates stated that they now advocate use of a smaller volume of a more concentrated STDS solution. Unfortunately, specifications for their new regimen were not provided. Even with the reported regimen, however, the authors achieved complete or more than 50% reduction of hydrocele volume in 13 of 25 patients (52%), and overall success (includes patient satisfied with outcome but with less than 50% volume reduction) in 19 of 25 (79%). Of these 19, only 4 required a second sclerosis session to achieve the desired outcome. I have used dehydrated alcohol mixed with lidocaine, replacing 10% of the hydrocele volume, with good success in a few patients but that regimen requires a local anesthetic infiltration of the spermatic cord and the patient has pain for about 48 hours. The STDS regimen appears to be easier on the patient. This option should be considered an excellent alternative to the surprisingly morbid “minor surgery” called hydrocelectomy.

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Technique for laparoscopic running urethrovesical anastomosis: the single knot method

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Urology 2003; 61: 699-702

Objectives: To describe a technique for facilitating the urethrovesical anastomosis at the time of laparoscopic radical prostatectomy.

Methods: Two 6-in. polyglycolic acid sutures (one dyed, one white) are tied together at their tail ends and delivered into the operative field by way of a 12-mm port. A running suture is completed from the 6:30 to the 12:00-o'clock position and from the 5:30 to the 12:00-o'clock position, at the end of which a single

intracorporeal tie is completed. The catheter is placed before completing the anterior row of sutures; the catheter is left in place for 5 to 7 days.

Results: This anastomotic technique has been used in 122 laparoscopic radical prostatectomies and 8 robot-assisted laparoscopic radical prostatectomies. The average time for the anastomosis was 35 minutes (range 14 to 80). All anastomoses were watertight. No symptomatic postoperative urinary leaks have occurred, and no clinically evident clinical bladder neck contractures resulted.

Conclusions: We describe a simple, watertight, running laparoscopic suture technique for accomplishing the urethrovesical anastomosis during laparoscopic radical prostatectomy.

Editorial Comment

This really is a wonderful suturing technique, which I was fortunate enough to learn about directly from the authors while visiting the University of California Irvine. Although I have not found it useful for laparoscopic pyeloplasties (I use the Endostich device with a non-robotic laparoscopic technique), the 2 of us at our institution performing robotic-assisted laparoscopic radical prostatectomies have used it with great satisfaction for the urethrovesical anastomosis. The authors' current modification of the technique described in this article (accepted in December 2002) includes using a monofilament suture for one arm and a braided suture for the other. The braided suture is first placed for 2 throws (outside-in on bladder neck, then inside-out on the urethra) and then the monofilament suture is placed for 5 throws (first 2 as for the braided suture, then 3 more throws). At this point 20- 25% of the anastomosis is complete and the bladder is pulled down to the urethra with gentle traction. The monofilament slides easily. Traction on the monofilament suture by the assistant keeps the anastomosis opposed as a few more throws are placed with the braided suture. Friction from the braided suture now keeps the anastomosis together without additional assistance and the remainder can be completed rapidly. This technique markedly simplifies the laparoscopic urethrovesical anastomosis. Our experience to date (albeit with short follow-up) is similar to that of the authors with no "clinically evident post-operative urinary leak or symptomatic bladder neck contractures."

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PATHOLOGY

Basal cell cocktail (34 β E12 + p63) improves the detection of prostate basal cells

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Mod Pathol. 2003; 16: 177A

Background: High molecular weight cytokeratin (34 β E12) and p63 are frequently used as basal cell markers in aid of diagnosis of prostate cancer (PCa). Absence of a basal cell marker in an atypical lesion histologically suspicious for PCa supports a malignant diagnosis. Yet, absence of basal cells by immunohistochemistry (IHC) is not always conclusive. Improving the sensitivity of basal cell IHC is critical to help make diagnostic decisions in conjunction with standard histology. We test the hypothesis that inclusion of both 34 β E12 and p63 in a cocktail reaction is advantageous over either marker used alone.

Design: 1350 benign glands from 9 TURP specimens were used to study the immunostaining intensity and pattern for 34 β E12, p63 and the basal cell cocktail. Basal cell marker expression was scored as strong, moderate, weak and negative. Basal cell staining was considered complete if 75% of the gland circumference was positive for the basal cell marker, and partial if 25% of the circumference was stained.

Results: By IHC, benign glands lack basal cell lining in 2, 6 and 2% of glands with cocktail, 34 β E12 and p63 staining, respectively. The staining variance for cocktail is significantly smaller than that for 34 β E12 (0.0100 vs. 0.1559, $p=0.0008$). No significant difference was seen between cocktail and p63 (0.0100 vs. 0.0345, $p=0.099$). The cocktail stains the basal cell layers more intensely than either 34 β E12 or p63 alone, with complete and partial strong basal cell staining in 93 and 1 % of benign glands, compared to 55 and 4% with 34 β E12, and 81 and 1% with p63. Complete and partial weak staining is seen in 0 and 0% of benign glands with the cocktail, compared to 8 and 7% with 34 β E12 and 4 and 1% with p63 ($p=0.007$ and 0.014 for cocktail vs. 34 β E12 and cocktail vs. p63, respectively). 2.8% of clinically localized PCa had positive 34 β E12 staining and 0.3 % had positive p63 staining.

Conclusions: IHC of the prostatic glands from transition zone is subject to staining variability. 34 β E12 is most susceptible, and basal cell cocktail is least susceptible to such variability. Basal cell cocktail not only increases the sensitivity of the basal cell detection, but also reduces the staining variability and therefore renders the basal cell IHC more consistent.

Editorial Comment

Basal cells are of utmost importance for the diagnosis of adenocarcinoma of prostate. Their presence excludes this diagnosis. Their absence, however, does not mean necessarily that the acinus's is neoplastic. Most of the times their presence is recognized on hematoxylin and eosin stains. They are located close to the basement membrane, are round, oval or pyramidal and sometimes the nucleus is involved by a clear halo. They are precursors to the secretory cells and not myoepithelial cells.

In cases of "atypical small acinar proliferation" (ASAP) the presence of basal cells may help a final diagnosis of adenocarcinoma. ASAP is used in cases of "suspicious but not diagnostic of adenocarcinoma". I prefer this last expression because ASAP may give the impression of an entity or a particular lesion. It only expresses lack of some criteria for the definitive diagnosis of adenocarcinoma.

In this circumstance the immunostaining for basal cells is critical for the diagnosis. The pathologist uses high molecular cytoqueratins (34 β E12) to disclose these cells. Not always this stain is uniform and uncertainty remains as to the correct diagnosis. The cocktail, that is, adding to 34 β E12 the p63 seems to improve the efficacy of this immunostaining. We hope that other studies confirm the findings of this paper considering that using 2 antibodies makes the immunostaining more expensive.

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The addition of a negative 34 β E12 stain to a small focus of atypical glands on prostatic core biopsies does not predict a higher incidence of prostatic adenocarcinoma on follow up biopsies

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Background: Atypical glands on prostate needle biopsy with a negative 34 β E12 immunostaining, indicating a lack of a basal cell layer, are typically diagnostic criteria of prostate cancer. However, there are certain cases in which a negative 34 β E12 immunostaining in a small focus of atypical glands is still not convincing enough to make the diagnosis of cancer. This study is the first report to evaluate the incidence of prostate cancer on follow-up biopsy in individuals with this diagnosis.

Design: 543 men who had prostate core biopsies diagnosed as a small focus of atypical appearing glands with a negative 34 β E12 immunostaining between 1/1/97 and 12/31/00 were selected for study.

Results: 61% of the 543 individuals had at least one follow up biopsy (n=332). Of these, 43% of repeat biopsies were diagnostic of prostate cancer (n=142). 46 men had at least 2 follow up biopsies, with 48% of these (n=22) being diagnosed as cancer. The percent of carcinomas having Gleason grades 3+2=5, 3+3=6, 3+4=7, 4+3=7 and 4+4=8 were 6%, 86%, 1%, 4% and 3% respectively. The median amount of time to the first follow up biopsy was 79 days, with 52% of follow up biopsies being performed within 90 days.

Conclusions: A negative 34 β E12 immunohistochemical stain in a small focus of atypical glands is not associated with an increased prediction of prostate cancer on follow up biopsy (43%), compared with previously published data for “small focus of atypical glands” alone (approximately 45%). As 48% of men with an initial negative biopsy and multiple follow up biopsies were found to have cancer, more than one repeat biopsy or more extensive sampling on first repeat biopsy may be necessary to maximize the identification of cancer. This is the same as has been shown for men with atypical diagnoses in general, without a negative 34 β E12 immunohistochemical stain. Only half of all individuals with a diagnosis of 34 β E12 negative focus of atypical glands were rebiopsied within 3 months. Urologists need to be educated as to the significance of an atypical diagnosis and the need for rebiopsy.

Editorial Comment

The presence of basal cells excludes the diagnosis of adenocarcinoma but their absence does not mean necessarily that the acinus is neoplastic. This article emphasizes the need of morphologic criteria for the diagnosis of adenocarcinoma. The pathologist should not rely on his diagnosis exclusively on the result of immunostaining.

In cases of “atypical small acinar proliferation” (ASAP), immunostaining is indicated to help making the diagnosis of adenocarcinoma. This study, however, showed that a negative 34 β E12 immunohistochemical stain in a small focus of ASAP is not associated with an increased prediction of prostate cancer on follow up biopsy (43%), compared with previously published data (approximately 45%).

In cases of ASAP the pathologist, besides immunostaining, performs new sections in other levels of the biopsy hoping the lesion appears more extensive. In cases the immunostaining does not show basal cells but the morphologic criteria are still not sufficient for the diagnosis of adenocarcinoma, the diagnosis is ASAP and not adenocarcinoma.

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IMAGING

High-resolution multidetector CT in the preoperative evaluation of patients with renal cell carcinoma

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Purpose: The purpose of our study was to evaluate the accuracy of multidetector CT (MDCT) using a high-resolution protocol in the preoperative assessment of patients with renal cell carcinoma who are possible candidates for nephron-sparing surgery.

Materials and Methods: Forty patients with suspected renal cell carcinoma underwent MDCT. Contrast-enhanced acquisitions were obtained during arterial, nephrographic, and urographic phases using a thin-slice protocol. One-millimeter-thick source images were evaluated by two observers on a dedicated workstation for the identification and characterization of the tumor, presence of a pseudocapsule or invasion of perirenal fat, involvement of adrenal glands or surrounding tissues, presence of satellite lesions within Gerota's fascia, infiltration of renal vein and inferior vena cava, involvement of lymph nodes, and presence of distant metastases. Imaging findings were compared with surgical specimens using criteria from the Robson and TNM classification systems.

Results: The presence and size of all lesions were correctly shown in all patients. In evaluating Robson stage I of renal cell carcinoma, we were able to diagnose fat infiltration on 1-mm scans with 96% sensitivity, 93% specificity, and 95% accuracy; the positive and negative predictive values were, respectively, 100% and 93%. One hundred percent accuracy was achieved in staging high-grade lesions.

Conclusion: High-resolution MDCT is accurate in the preoperative evaluation of patients with renal cell carcinoma.

Editorial Comment

Robson's Stage I (T1-T2) tumors are defined on spiral CT as a tumor confined within the kidney with an intact renal capsule. This is usually characterized when the perinephric fat and renal fascia adjacent to the lesion are preserved. Until now, the most specific sign of extension of the tumor to these structures has been the presence of a discrete mass measuring at least 1 cm in diameter projecting into the perinephric space. Although this finding is 98% specific for Robson's stage II (T3a) tumors, its sensitivity is too low (only 46%) as this finding is absent in the majority of patients with perinephric extension (1). As the perinephric fat and Gerota's fascia are resected during a radical nephrectomy, the radiological distinction between T1 and T3a has not been very important. More recently, however, renal conservative surgery has been performed with more frequency including the laparoscopic approach; thus, an accurate preoperative radiological staging is essential.

The point of this report is that the use of 1-mm-thick-multidetector CT images (MDCT) allowed the differentiation between Robson stage I (T1-T2) and T3a renal cell carcinoma, with 96% sensitivity, 93% specificity, 95% accuracy, 100% of positive predictive value and with 93% of negative predictive value. These results are very enthusiastic but studies with a larger series of patients are desirable. As we know CT-false positives diagnoses has been described in up to 50% of patients with Robson's Stage I disease. This can be explained because perinephric stranding and fascial thickening can occur due to perinephric edema (very nicely illustrated in one case of this report), fat necrosis and fibrosis from remote inflammation (2). Obviously, these data are related to studies performed with single slice spiral CT that has lower spatial resolution than the new generation of MDCT. Multidetector CT provides substantial improvement in volume coverage over single-

slice spiral CT. More rapid image acquisition allows better definition of renal capsule and greater separation of arterial and venous phases, thus facilitating multiphasic acquisition. This improvement was very well shown by the superb high resolution multiplanar reconstruction of the kidneys and renal vessels showed in this interesting manuscript.

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Imaging-guided radiofrequency ablation of solid renal tumors

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Purpose: We performed a retrospective review of imaging-guided radiofrequency ablation of solid renal tumors.

Materials and Methods: Since May 2000, 35 tumors in 20 patients have been treated with radiofrequency ablation. The size range of treated tumors was 0.9 - 3.6 cm (mean, 1.7 cm). Reasons for patient referrals were a prior partial or total nephrectomy (nine patients), a comorbidity excluding nephrectomy or partial nephrectomy (10 patients), or a treatment alternative to nephron-sparing surgery (one patient who refused surgery). Tumors were classified as exophytic, intraparenchymal, or central. Sixteen patients had 31 lesions that showed serial growth on CT or MR imaging. Of these 16 patients, four patients with 10 lesions had a history of renal cell carcinoma, and two patients with 11 lesions had a history of von Hippel-Lindau disease. Four patients had incidental solid masses, two of which were biopsied and shown to represent renal cell carcinoma, and the remaining two masses were presumed malignant on the basis of imaging features. Successful ablation was regarded as any lesion showing less than 10 H of contrast enhancement on CT or no qualitative evidence of enhancement after IV gadolinium contrast-enhanced MR imaging.

Results: Of the 35 tumors, 22 were exophytic and 13 were intraparenchymal. Twenty-seven of the 35 were treated percutaneously using either sonography (n = 22) or CT (n = 5). Two patients had eight tumors treated intraoperatively using sonography. Patients were followed up with contrast-enhanced CT (n = 18), MR imaging (n = 5), or both (n = 5) with a follow-up range of 1 - 23 months (mean, 9 months). No residual or recurrent tumor and no major side effects were seen.

Conclusion: Preliminary results with radiofrequency ablation of exophytic and intraparenchymal renal tumors are promising. Radiofrequency ablation is not associated with significant side effects. Further follow-up is necessary to determine the long-term efficacy of radiofrequency ablation.

Editorial Comment

Cryotherapy has been the most frequently thermal ablative technique used for alternative treatment of localized renal cell carcinoma. There are only few reports describing the utilization of radiofrequency ablation (RF) to renal tumors including only small series of patients. Radiofrequency renal tumor ablations can be performed under sonography or computed-tomography-guided percutaneous approach. After treatment, patients are usually followed up with CT scans at 6 weeks and 3, 6, and 12 months, and every 6 months thereafter. Successful ablation has been considered by many authors as a lesion along with a margin of normal parenchyma that no longer enhanced (less than 10 Hounsfield units) on follow-up contrast studies. The point of this report is that 35 tumors, ranging in size from 0.9 to 3.6 cm (mean = 1.7 cm), were treated by RF with no residual or recurrent lesions. The criterion of successful ablation was the same used by other authors and based strictly on radiologic findings (absence of lesion's enhancement). Radiographic follow-up of radiofrequency ablated small renal tumors, however, may demonstrate little or no residual contrast enhancement depending on tumor size, location within the kidney, and mode of delivering radiofrequency energy. As already pointed out by the authors the absence of postprocedural biopsy can be considered a relative limitation of this study since pathologic examination after RF ablation may show a residual viable tumor in few patients. Another point to be considered is that when performed, adequate histopathologic evaluation of the tumors specimens treated by RF-ablations should include hematoxylin-eosin and a nicotinamide adenine dinucleotide staining in order to determine the presence or absence of tissue viability. This manuscript is recommended because shows very clearly that RF ablation can successfully destroy small peripheral renal tumors with no significant damage to the normal renal parenchyma and more important without significant side effects.

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INVESTIGATIVE UROLOGY

Radiation increases fibrogenic cytokine expression by Peyronie's disease fibroblasts

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J Urol. 2003; 170: 281-4

Purpose: Peyronie's disease is a crippling penile deformity that results from fibrosis in the tunica albuginea. To our knowledge its cause is unknown and empirical therapies are used extensively. A factor involved in the development of Peyronie's disease is fibrogenic cytokine over expression. Radiation therapy is an empirical therapy for this condition and, while some data suggest a role for it, no literature exists on the effects of radiation on tunical tissue or cells derived from this tissue. We evaluated the effect of radiation on fibrogenic cytokine production in cells cultured from Peyronie's disease plaque tissue.

Methods and Materials: Using a well established cell culture model cells derived from Peyronie's disease plaque tissue and neonatal foreskins were irradiated with 5 Gy (treatment group) or left nonirradiated (control group). At 24 hours cells were harvested and the supernatant was analyzed using enzyme-linked immunosorbent assay to determine the levels of the 2 fibrogenic cytokines basic fibroblast growth factor and platelet-derived growth factor-AB.

Results: Four Peyronie's disease plaque derived cultures and 2 neonatal foreskin derived cultures were analyzed. All plaque derived fibroblasts demonstrated significant elevations in basic fibroblast growth factor and platelet-derived growth factor-AB compared with foreskin derived fibroblasts.

Conclusions: These data suggest that radiation may in fact increase the production of fibrogenic cytokines, which may promote the fibrotic process involved in Peyronie's disease. Further study is aimed at defining the effect of irradiation on plaque tissue.

Editorial Comment

Repeated tunical mechanical stress and microvascular trauma is one the most accepted causes of Peyronie's disease. Microvascular trauma or subtunical bleeding consequent to sexual intercourse can result in fluid and fibrinogen in the subtunical layers. The resulting fibrin deposits may initiate a wound healing response, which in addition to pain and hematoma; determine a subsequent inflammatory response with recruitment of macrophages and neutrophils. These cells release a variety of cytokines and vasoactive factors that may lead to a fibrotic reaction (1-4).

Among nonsurgical options for management of Peyronie's disease, extracorporeal shock wave therapy and radiation are proposed. Nevertheless, there is no clear information on the effects of radiation on tissue of Peyronie's disease. In this elegant study, the authors used their established cell culture model to define the effects of radiation on the biology of Peyronie's disease plaque tissue derived fibroblasts. Interestingly and surprisingly, the authors found that radiation at a dose of 5 Gy induced the Peyronie's disease fibroblasts to dramatically increase the production of basic fibroblast growth factor and platelet-derived growth factor-AB, when compared to controls. These findings suggest that radiation therapy would determine the fibrotic process of the disease, and, therefore, worsen the Peyronie's plaque.

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Dimethyl sulfoxide: does it change the functional properties of the bladder wall?

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Purpose: Dimethyl sulfoxide (DMSO) is used in a 50% solution to treat interstitial cystitis. Symptomatic relief occurs in about two-thirds of cases. The mechanism of action and effects of DMSO on bladder tissue function are poorly understood. Therefore, the effect of DMSO on bladder muscle compliance and contractility was evaluated.

Materials and Methods: Contractility and compliance were evaluated in rat bladder strips exposed to various concentrations of DMSO for 7 minutes, followed by 7 to 60-minute washout periods. The effect of DMSO at concentrations of 25%, 30%, 35%, 40% and 50% on electrical field stimulation induced contractions was assessed. Acetylcholine and high KCl (Sigma Chemical Co.) induced contractions were measured after exposure to 30% DMSO. Compliance was evaluated after exposure to 30% and 50% DMSO.

Results: Exposure to 40% DMSO completely abolished electrical field stimulation contractions, while 30% DMSO decreased the electrical field stimulation contraction to $40\% \pm 6\%$ of the initial force but there was almost complete recovery within 30 minutes. Contractile force was unaltered by 25% DMSO. Acetylcholine and KCl stimulation after exposure to 30% DMSO produced contractile forces of $78\% \pm 6\%$ and $39\% \pm 6\%$ of pre-DMSO control contractions, respectively. Compliance decreased by 2.4 and 4.6-fold following 30% and 50% DMSO exposure, respectively.

Conclusions: DMSO completely and irreversibly abolishes contractions at a 40% concentration. Compliance is altered at even lower concentrations (30%). These findings bring into question the current practice of treating patients who have IC with 50% DMSO. Lower concentrations (25%) of DMSO may serve as a safe, effective analgesic and anti-inflammatory treatment for IC and other bladder pathologies.

Editorial Comment

Interstitial cystitis (IC) has been described more 100 years ago; nevertheless, its pathogenesis and etiology remain unknown. For that reason, the treatments available for IC are empirical and symptomatic.

Dimethyl sulfoxide (DMSO) is the treatment of choice for intravesical therapy in IC. DMSO is a scavenger of the intracellular OH radical believed to be an important trigger of inflammatory process (1). Although its mechanism of action in IC is not fully elucidated, this substance has multiple effects and DMSO treatment is associated with a low frequency of serious adverse effects. In general, DMSO is administered twice weekly as 50 ml sterile filtered 50% solution (2).

The same group of the present work investigated previously the effect of DMSO on the proliferation of bladder smooth muscle cells in culture and noted that DMSO at high concentration (greater than 10%) can result in apoptotic cell death, while in low concentrations (less than 5%) it can act as an antiproliferative agent and inhibit cell growth in a dose dependent manner without direct cellular toxicity (3).

In the present work, the authors demonstrated that application of DMSO at concentrations of 30% might lead to irreversible changes in bladder smooth muscle contractility and bladder tissue compliance. Although the current investigation has been performed in rats and in a nonphysiological environment (bladder strips), these results present cause for apprehension, because if these consequences also exist in vivo and in humans, the DMSO concentration of 50% may need to be reassessed for clinical use.

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RECONSTRUCTIVE UROLOGY

Topography of the pelvic autonomic nervous system and its potential impact on surgical intervention in the pelvis

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Clin Anat. 2003; 16: 119-30

Bladder, bowel, and sexual dysfunction caused by iatrogenic lesions of the inferior hypogastric plexus (IHP) are well known and commonly tolerated in pelvic surgery. Because the pelvic autonomic nerves are difficult to define and dissect in surgery, and their importance often ignored, we conducted a gross anatomic study of 90 adult and four fetal hemipelvises. Using various non-surgical approaches, the anatomic relations and pathways of the IHP were dissected. The IHP extended from the sacrum to the genital organs at the level of the lower sacral vertebrae. It originated from three different sources: the hypogastric nerve, the sacral splanchnic nerves from the sacral sympathetic trunk (mostly the S2 ganglion), and the pelvic splanchnic nerves, which branched primarily from the third and fourth sacral ventral rami. These fibers converge to form a uniform nerve plate medial to the vascular layer and deep to the peritoneum. The posterior portion of the IHP supplied the rectum and the anterior portion of the urogenital organs; nerve fibers traveled directly from the IHP to the anterolateral wall of the rectum and to the inferolateral and posterolateral aspects of the urogenital organs. The autonomic supply from the IHP was supplemented by nerves accompanying the ureter and the arteries. An understanding of the location of the autonomic pelvic network, including important landmarks, should help prevent iatrogenic injury through the adoption of surgical techniques that reduce or prevent postoperative autonomic dysfunction.

Editorial Comment

A description of the pelvic autonomic nerves system is nothing totally new. However, even after more than a century of pelvic surgery and interventions we still have not clearly straightened out the exact role of autonomic nerve fibres for some of the pelvic organs nor do we know everything about their variability in relation to pelvic organs. Recent papers have shown that autonomic nerve fibres may be responsible for sensory stimuli in the membranous urethra of male patients after prostatectomy or cystoprostatectomy. Furthermore these nerves regulate contractility and muscle tone in the remnant urethra in female cystectomy patients undergoing an orthotopic neobladder. Urinary retention in patients undergoing rectal surgery may at least in part be caused by irritation or destruction of parasympathetic or sympathetic fibres contributing to the plexus.

In this paper the authors have demonstrated among other things that the sacral contributions to the pudendal nerve were the same as for the autonomic inferior hypogastric plexus. This brings an old discussion back whereby at least some autonomic nerve functions may be transmitted via the pudendal nerve. Another important message in this paper is that surgeons should be much more aware of nerve sparing techniques during rectal surgery because of its implications to urinary and sexual function of their patients. Clinical anatomy using both new staining techniques and fetal specimens can still yield interesting and sometimes even new aspects regarding pelvic surgery and preservation of life quality without oncological compromise.

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Identification of communicating branches among the dorsal perineal and cavernous nerves of the penis

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Purpose: The mechanism of human erection requires the coordination of an intact neuronal system that includes the cavernous, perineal, and dorsal nerves of the penis. We defined the communication of these 3 nerves that travel under the pubic arch using specific neuronal immunohistochemical staining and 3-dimensional reconstruction imaging technique.

Materials and Methods: A total of 18 normal human fetal penile specimens at 17.5 to 32 weeks of gestation were studied by immunohistochemical techniques. Serial sections were stained with antibodies raised against the neuronal markers S-100, and neuronal nitric oxide synthase (nNOS), vesicular acetylcholine transporter (VAcHT), calcitonin gene-related peptide and substance P.

Results: The continuation of the dorsal neurovascular bundle of the prostate was documented under the pubic arch. Two distinct nerve bundles were identified superior to the urethra and medial to the origin of the crural bodies. Nerve bundles were observed to join the corporeal bodies at the penile hilum. Proximal to the penile hilum the dorsal nerves stained only for S-100 and VAcHT. From the junction of the crural bodies at the hilum to the glans penis dorsal nerve fibers stained positive for S-100, VAcHT and nNOS. Calcitonin gene-related peptide and substance P demonstrated positive staining at the distal nerves, particularly at the glans. In contrast, the whole course of the cavernous nerve stained for S-100 and nNOS. Under the pubic arch at the penile hilum the cavernous nerves were found to convey nNOS positive branches to the dorsal nerve to transform its immunoreactivity to nNOS positive. Proximal nNOS negative perineal nerves were shown to stain positive for nNOS distal on the penis. Interaction between nNOS positive dorsal nerve branches and perineal nerves was at the cavernous-spongiosal junction, where the bulbospongiosus muscle terminates.

Conclusions: At penile hilum, where the corporeal bodies start to separate, the cavernous nerve sends nNOS positive fibers to join the dorsal nerve of the penis, thereby, changing the functional characteristics of the distal penile dorsal nerve. Similarly the nNOS negative, ventrally located perineal nerve originating from the pudendal nerve becomes nNOS reactive at the cavernous-spongiosal junction. These 2 examples of redundant neuronal wiring in the penis may impact erectile function, especially during reconstructive surgery.

Editorial Comment

This is another paper that shows again our imperfect knowledge of urogenital innervation. Yucel and Baskin in an elaborate work demonstrate the interaction of both pudendal and dorsal penile nerves with branches of the hypogastric nerves at the level of the base of the penis. All of a sudden we cannot be sure anymore that e.g. the pudendal nerve has only somatic purposes or that branches of the hypogastric plexus are purely autonomic.

If there exists such an interacting network in an area where we are very close during pelvic floor surgery than the differences of nerve-sparing surgical procedures in the individual patient may become more understandable. Could it be that in some patients where no nerve-sparing procedure is performed collateral nerve supply from other nerves result in good functional outcome with regards to the potency, which is otherwise not explainable?

We constantly have to refine and sometimes revise old dogmas especially in areas such as pelvic surgery and their anatomy if what we find does not 100% correspond with published schemes. Above all preservation of autonomic nerves does not result in perfect penile functions even in the hands of the best surgeons. And on the other hand deliberate dissection of autonomic nerves may still not lead to erectile dysfunction in all cases. Maybe studies like this one explain one of several possibilities.

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UROLOGICAL ONCOLOGY

Port site metastases in urological laparoscopic surgery

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J Urol. 2003; 169: 1213-8

Purpose: Laparoscopic surgery is rapidly gaining widespread acceptance among urologists, including extensive application in malignant conditions. However, untoward occurrences of port site metastases have not eluded to urological applications. This up-to-date review on port site metastases in urology delineates possible contributing factors and describes techniques to prevent it.

Materials and Methods: We comprehensively reviewed published experimental and clinical studies with special emphasis on the incidence, pathophysiology and prevention of port site metastases.

Results: Nine cases of port site metastases after urological laparoscopy have been described in clinical and experimental studies. Etiological factors include natural malignant disease behavior, host immune status, local wound factors, laparoscopy related factors such as aerosolization of tumor cells (the use of gas, type of gas, insufflation and desufflation, and pneumoperitoneum) and sufficient technical experience of the surgeons and operating team (adequate laparoscopic equipment, skill, minimal handling of the tumor, surgical manipulation and wound contamination during instruments change, organ morcellation and specimen removal).

Conclusions: Port site metastases is a multifactorial phenomenon with an as yet undetermined incidence. The problem is influenced to some extent by surgeon and operating team experience and, therefore, it could be partially prevented. The suggested preventive steps are avoiding laparoscopic surgery when there are ascites, trocar fixation to prevent dislodgment, avoiding gas leakage along and around the trocar, sufficient technical readiness of the operating team (adequate laparoscopic equipment and technique, minimal handling and avoiding tumor boundary violation of the tumor), using a bag for specimen removal, placing drainage when needed before desufflation, povidone-iodine irrigation of instruments, trocars and port site wounds, and suturing 10 mm. and larger trocar wounds.

Editorial Comment

This thorough review describes a rare but existent event in laparoscopy of urological tumors, metastases in the port tract. The authors analyzed the published literature on incidences of port site metastases and (only) found 9 cases. They conclude, that the real incidence of a port site metastases is yet undetermined (that is, many might be falsely referred to as local recurrences of the tumor).

Factors to prevent port site metastases are analyzed and specified in detail. Further to the data given in my one analysis of the data, 1 important point became obvious: 5 of the 9 cases described were transitional cell carcinomas. With the background of the known implantation rate in transurethral resection of superficial bladder tumors, this tumor entity might not be the ideal indication for a laparoscopic approach. Certainly further research on this phenomenon is necessary.

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FEMALE UROLOGY

Management of vaginal erosion of polypropylene mesh slings

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Purpose: The SPARC (American Medical Systems, Minneapolis, Minnesota) polypropylene sling has recently been introduced as an alternative delivery system to TVT (Ethicon, New Brunswick, New Jersey) tension-free vaginal tape for placement of a tension-free mid urethral sling. Erosion must always be considered a risk of synthetic materials. We present 4 cases of vaginal erosion of polypropylene mesh placed with this system and the successful conservative management done.

Materials and Methods: A total of 90 patients received a SPARC polypropylene pubovaginal sling at our institution between October 1, 2001 and October 1, 2002. During followup 3 of our patients and 1 patient with tension-free vaginal tape who was referred from elsewhere presented with vaginal exposure of the mesh.

Results: Two patients described persistent vaginal discharge 6 weeks postoperatively, including 1 who complained primarily of partner discomfort during sexual intercourse. Two patients were completely asymptomatic and mesh erosion was discovered at routine physical examination 6 weeks postoperatively. Pelvic examination demonstrated vaginal exposure of the mesh in all cases. Each patient was observed conservatively and 3 months postoperatively all 4 had complete spontaneous epithelialization over the mesh. None had stress incontinence, urgency or urge incontinence, all emptied the bladder to completion and all patients were completely satisfied with the procedure.

Conclusions: The recent literature suggests that polypropylene mesh erosion should be treated with complete removal of the sling material. We present 4 cases of vaginal erosion of polypropylene slings that were managed conservatively with observation and resulted in complete spontaneous healing. Sling preservation with continued patient continence and satisfaction is a feasible option in those with vaginal exposure of polypropylene mesh.

Editorial Comment

The authors describe their experience with four patients with vaginal erosion of their polypropylene mesh sling into the vagina. None of the patients had an erosion of the urinary tract (i.e. into the urethra or into the bladder). Two of the patients were completely asymptomatic while the other two had persistent vaginal discharge including one whose partner complained of pain with sexual relations. All four patients were treated conservatively and at 3 months post-operatively all the erosions had complete epithelialization with a normal exam noted. None of the patients had any voiding dysfunction such as recurrent stress urinary incontinence or urge incontinence during their course of treatment.

This is an important paper with regards to management of those patients who have vaginal erosion of their artificial material slings. It is succinct and well written. Many times in practice a patient will be identified who has deemed herself an operative success but has an erosion of artificial material noted in the vagina. The next clinical question is usually: should this patient be subjected to complete removal of the sling if they are indeed asymptomatic with good urinary control? This paper addresses this very point. They illustrate that with a minimalist approach there was complete epithelialization and no voiding dysfunction.

In addition to the reported clinical results, the article is valuable for the discussion on sling removal versus oversewing of the vaginal mucosa over the sling. Excellent points are made regarding the potential impact of the loosely woven polypropylene mesh with regards to its large pores and allowing tissue in-growth. They make a direct contrast between the construction and properties of the polypropylene as opposed to other synthetic materials such as polyester and silicone (1). In addition, the authors do point out that none of the patients in their report had a urinary tract erosion such as into the urethra and bladder which would be a different malady to both diagnose and treat (2). This paper gives clinicians food for thought with regard to management of those patients who have a simple vaginal erosion after a polypropylene mesh sling. Perhaps the rate of vaginal erosion is higher and the clinician does not appreciate its presence secondary to the lack of symptoms and its eventual auto-resolution. The authors should be lauded for delineating a plan of action that allows us to be more heartened with the counsel of simple sexual abstinence and tincture of time for this post operative complication.

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PEDIATRIC UROLOGY

Vulvovaginitis in prepubertal girls

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Arch Dis Child. 2003; 88: 324-6

This retrospective study evaluated the clinical features and findings in bacterial cultures and in microscopic examination of vaginal secretions in 80 prepubertal girls, aged 2-12 years, with vulvovaginitis. Vaginal secretions were obtained directly from the vagina with a sterile catheter carefully inserted into the vagina. Pathogenic bacteria were isolated in 36% of cases. In 59% of these cases the isolated pathogen was group A beta-haemolytic streptococcus. *Candida* was not found in any of the patients. The finding of leucocytes in vaginal secretions as an indicator for growth of pathogenic bacteria had a sensitivity of 83% and a specificity of 59%. Antimicrobial treatment should therefore be based on bacteriological findings of vaginal secretions and not on the presence of leucocytes alone.

Editorial Comment

This study evaluates retrospectively the clinical features and culture results in 80 prepubertal girls referred to a pediatric gynecology clinic. Nearly all had vaginal discharge and many had itching and redness as well. Cultures revealed pathogenic bacteria in 29 of the 80, Group A, beta-hemolytic streptococcus being the most common (41% of these patients had a recent history of sore throat). With blood cells (WBCs) were present in the secretions in 24/29 patients with pathogenic organisms and 21/51 of those without.

This study provides guidance in the management of vulvovaginitis in girls. In particular, in the absence of WBCs, it is unlikely that pathogenic bacteria are present. Furthermore, Group A streptococcus is the most common organism. However the study has several important flaws. First and foremost there are no controls. What percentage of normal girls have WBCs or streptococcus in their vaginal secretions? Also, no cultures were done for *Chlamydia*, gonorrhea or *Trichomonas*. Despite the fact that none of these children had a history of sexual abuse, this is an unfortunate error.

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Relationship between age at initiation of toilet training and duration of training: a prospective study

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Objective: To study the relationship between age at initiation of toilet training, age at completion of toilet training, and the duration of toilet training.

Methods: A total of 406 children seen at a suburban private pediatric practice were enrolled in a study of toilet training between 17 and 19 months of age, and 378 (93%) were followed by telephone interviews with the parents every 2 to 3 months until the child completed daytime toilet training. Information obtained at follow-up interviews included how often parents were asking their child to sit on the toilet or potty and where the child urinated and defecated. Parents were considered to have initiated toilet training when they first took out a potty chair and discussed some aspect of training with the child. Intensive toilet training was defined as asking the child to use the toilet or potty more than 3 times per day.

Results: Age of initiation of toilet training correlated with age of completion of training ($r = 0.275$). The correlation between age at initiation of intensive training and age at completion was even stronger ($r = 0.459$). Younger age at initiation of intensive toilet training was not associated with constipation, stool withholding, or stool toileting refusal. However, age at initiation of intensive toilet training was negatively correlated with duration of toilet training ($r = -0.481$), indicating that initiation of training at younger ages was associated with a longer duration of training. In addition, the correlation between age at initiation of intensive toilet training and age at completion of training was not significant for those who began intensive training before 27 months of age ($r = 0.107$).

Conclusions: Early initiation of intensive toilet training correlates with an earlier age at completion of toilet training but also a longer duration of toilet training. Although earlier toilet training is not associated with constipation, stool withholding, or stool toileting refusal, initiation of intensive training before 27 months does not correlate with earlier completion of toilet training, suggesting little benefit in beginning intensive training before 27 months of age in most children.

Editorial Comment

This study evaluates prospectively the consequences of early toilet training in a suburban private pediatric practice setting. Early toilet training did not correlate with constipation or stool withholding. Earlier toilet training did correlate with prolonged duration of training. The authors conclude that the initiation of intensive toilet training before 27 months of age is rarely indicated.

This study is important in that there have been concerns that attempts at toilet training started too early might be counterproductive, with more voiding dysfunction and constipation resulting. That did not appear to be the case in this study, although younger children did take longer to train. This study was limited to suburban private practice patients and may not be generalized to other groups. Another problem relates to the fact that the patients were evaluated by regular phone interviews every 2-3 months. Telephone interviews may be unreliable as a method of evaluating voiding dysfunction and constipation. Furthermore, one wonders whether the regular telephone interviews might also have had a therapeutic effect in and of itself. Nonetheless, the study does provide some useful data that suggests that early and aggressive toilet training is not dangerous.

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