

The Posterior Sagittal Approach for Recurrent Genitourinary Pathology

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Purpose: The posterior sagittal transanorectal approach offers the surgeon excellent exposure to the lower genitourinary system. The approach has been successfully used for revisional surgery involving the urinary tract and rectum. We have used this approach to treat müllerian remnants, acquired or congenital fistulas and acquired urethral strictures. In the setting of revisional surgery abdominal or perineal approaches may not provide the same level of exposure to the lower urinary tract.

Materials and Methods: Of 911 males who underwent a posterior sagittal approach 12 were identified in whom this approach was used to manage lower urinary tract problems without associated anorectal malformation (group 1). An additional 58 patients with associated anorectal malformations were included in analysis (group 2).

Results: All cases were approached with a posterior sagittal incision to facilitate exposure after failed prior surgical attempts to treat traumatic strictures of the proximal urethra in 4 and müllerian remnants in 8 (group 1). In group 2 there were 19 urethral diverticula, 8 strictures and 31 persistent rectourethral fistulas. Followup was 6 months to 15 years. There were no recurrences identified in group 1. In group 2 there were 5 postoperative urethrocutaneous fistulas. Data on potency were available on 4 patients in group 1 and 14 in group 2. All 14 patients in group 2 reported intact potency after surgery. One patient in group 1 was impotent before and after surgery.

Conclusions: The posterior sagittal approach is helpful for addressing lower urinary tract pathology when exposure is inadequate from a perineal or abdominal approach. We propose that better exposure with this approach may limit inadvertent injury to nerves and result in more complete treatment of the presenting pathological condition. This approach provides an alternative that warrants careful consideration when dealing with the lower genitourinary tract in pediatric patients, especially in the setting of revisional surgery.

Key Words: abnormalities, reconstructive surgical procedures, urinary tract

The posterior sagittal approach provides excellent exposure to the structures of the perineum and anorectal canal, and it was originally described for treating anorectal and cloacal malformations.^{1,2} It allows visualization of the anatomy of the perineum, especially for pathological conditions located in the space between the concavity of the sacrum and the posterior pubis.³ For the genitourinary surgeon this would provide an alternate way to access the posterior urethra, bladder neck and seminal vesicles, especially in settings in which prior surgical treatment had failed.

Access to the structures of the pelvis has been performed successfully with a transabdominal, retropubic, retroperitoneal or perineal approach. However, exposure can be lacking, especially in the setting of revisional surgery. Scar can obliterate tissue planes and even with meticulous dissection the delicate structures of the perineum can be damaged in this setting. Laparoscopy also has an important role in addressing this pathological conditions but the technique becomes limited in the setting of revisional surgery.

In the adult literature, the York-Mason approach has been used to address acquired rectourethral fistulas with good success.^{4,5} The posterior sagittal approach with splitting of the rectum (transanorectal) has also been applied to children with urogenital sinus anomalies in the setting of a normal anus.⁶ It

seems logical that a posterior approach could also benefit pediatric patients by addressing symptomatic müllerian remnants, fistulas, seminal vesicle cysts or even proximal urethral strictures that are located too high to allow comfortable access via a perineal approach and too low to reach from the abdomen.

The anterior sagittal transrectal approach has also been used by urologists in the past to address lower urinary tract pathology. This approach is a modification of the posterior sagittal approach.⁷ The difference between the 2 approaches is patient positioning and the avoidance of splitting the posterior rectal wall. However, in the setting of revisional surgery, ie after perineal surgery the posterior sagittal approach allows one to access the perineum without going through prior scar.

We have successfully used the posterior sagittal approach for acquired genitourinary pathology in the setting of associated anorectal malformations.⁸ This includes acquired urethral atresia, posterior urethral diverticula and persistent fistulas (fig. 1). Success in managing urethral pathology in these patients prompted us to use the approach in patients without associated anorectal malformations in the setting of revisional surgery.

MATERIALS AND METHODS

A total of 911 males underwent a posterior sagittal approach from 1981 to 2006. Of these patients 12 were retrospectively

Study received institutional review board approval.

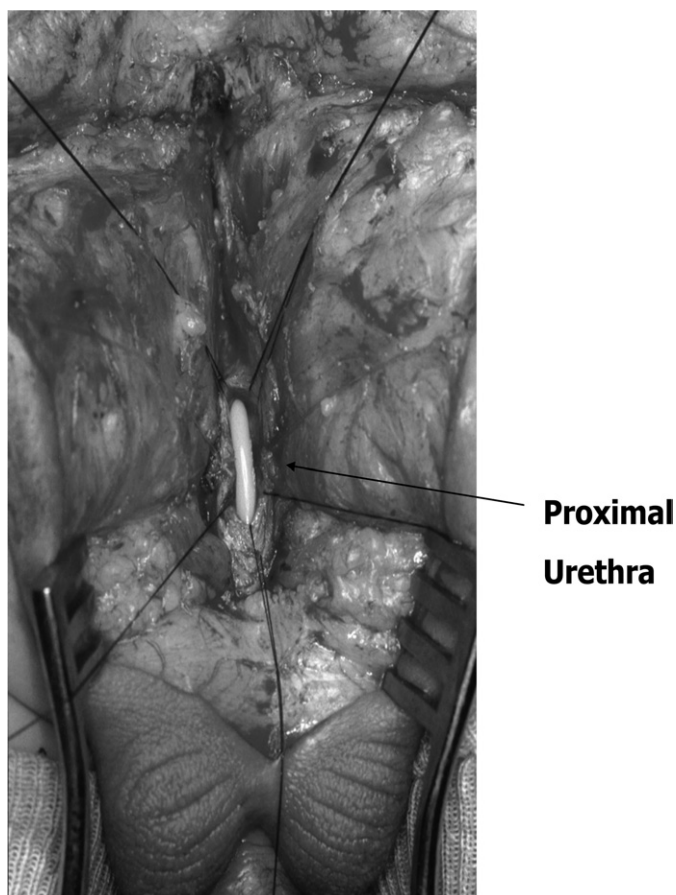


FIG. 1. Child with anorectal malformation and urethral stricture. Child is prone and rectum was mobilized so that it is out of field. Proximal urethra is easily visualized.

identified as having undergone posterior sagittal transanorectal approaches for genitourinary pathology without associated anorectal malformations (group 1). These 12 patients underwent surgery performed by one of us (AP). An additional 58 patients were identified for comparison with urinary tract pathology as well as associated anorectal malformations (group 2). All patients underwent revisional surgery using a posterior sagittal approach. The patients were assigned to different groups to compare outcomes after performing a posterior sagittal approach in the setting of revisional surgery in those with and without an associated ARM. Institutional review board approved retrospective analysis was used.

All patients were male and 2 to 43 years old at surgery. Followup was 6 months to 15 years. Females were excluded from analysis. We have used the transanorectal approach in men with acquired fistulas after prostate cancer treatment but they were not included in analysis. Patients referred without a prior attempt at repair regardless of associated genitourinary pathology were also excluded from analysis.

RESULTS

All patients in group 1 underwent a midline posterior sagittal transanorectal approach after failed abdominal or perineal surgery. Those in group 2 underwent a posterior sagittal approach with mobilization of the rectum to ex-

pose the posterior urethra. These patients had also undergone a prior attempt at repair. In the patients without associated anorectal malformations (group 1) there were 4 traumatic strictures of the proximal urethra and 8 müllerian remnants (table 1). To date there have been no recurrences in this group. Two patients in the series were lost to followup. All patients were continent at a minimum of 6 months of followup. Potency data were known on 4 patients with 3 (75%) reporting intact erections and ejaculation. One patient who had a stricture following a crush injury was impotent before and after surgery (table 2). There was 1 documented case of paternity in a patient with a large seminal vesicle cyst.

There were 3 patients in whom urethral strictures were managed with cystostomy tubes and diverting colostomies before referral. One patient in this group was treated with a suprapubic tube alone and underwent repair without fecal diversion. Only 1 of the patients with posterior urethral pathology underwent diversion with colostomy. No patient in this series was in urinary retention postoperatively.

The 4 patients with urethral strictures were unique because 3 (75%) underwent diversion with colostomy before referral. These patients were victims of blunt trauma with pelvic fractures and they received diversion because of associated injuries. All 4 patients underwent a prior attempt at stricture repair, in addition to surgery related to the trauma.

The patients with müllerian remnants were also unique. They were referred not for simple excision of the pathological conditions, but rather because prior attempts at excision had failed and the patients were symptomatic with recurrent urinary tract infections and orchiepididymitis. Only 1 patient in this group underwent diversion before surgery. Diversion was performed because in this patient several prior attempts at repair had failed and he was considerably older at operation (40 years).

Surgical success in group 1 was defined as treatment of the primary pathological conditions without evidence of recurrence. To our knowledge no patients have required urinary diversion or further procedures. Followup studies, such as formal urodynamics or noninvasive uroflowmetry, were unfortunately not readily available at the time of this chart review. Institutional review board approval is currently being sought to contact patients to determine long-term outcomes after repair.

In the remaining 58 patients with ARM (group 2) indications for surgery were urethral diverticula in 19, acquired strictures in 8 and persistent rectourethral fistulas in 31 (table 1). One patient with a persistent rectourethral stricture had what was thought to be a low anorectal malformation and he was treated with perineal anoplasty. He also had a delayed diagnosis of posterior urethral valves. It was not until after transurethral incision of the valve leaflets that an unrecognized rectourethral fistula became apparent.

TABLE 1		
	No. Group 1	No. Group 2
Stricture	4	8
Posterior urethral diverticulum	8	19
Persistent fistula	0	31
Totals	12	58

TABLE 2

Group	No. Group 1 (%)	No. Group 2 (%)
Continent urine	10 (100)	38 (74.5)
Continent stool	10 (100)	41 (80)
Potent with/without ejaculation	3/4 (75)	14/14 (100)
Urethrocuteaneous fistula	0	5
Lost to followup	2	8

A total of 38 patients (74.5%) were continent of urine in group 2 after surgery. Residual urethral pathology did not influence the preservation of continence. Rather, the number of failed prior attempts at repair or associated neurological anomalies were more predictive in this group, as described. No patient in this group was incontinent as a result of surgery.

There was postoperative urinary retention in 1 patient with recurrent urethral stricture, which was managed by a suprapubic tube. Overall there were 5 failures (8%) in group 2.

In group 2, 14 of 14 patients (100%) reported erections sufficient for penetration, of whom 8 reported successful ejaculation. These patients represent those in whom these data were known. There were no reports of impotence in group 2. There were 2 documented cases of paternity among these patients. Eight patients were lost to followup (table 2). No patients reported loss of potency after repair.

DISCUSSION

Our intent is to expose the pediatric genitourinary surgeon to another option for addressing posterior urethral and perineal pathology, especially after the more traditional approaches have failed. We described the posterior sagittal approach for addressing urethral pathology in the past as a primary means of surgery. The novelty of this series of patients is to suggest that the posterior sagittal approach can be used safely even after multiple failed prior attempts at repair. It was demonstrated in the past that the posterior sagittal transanorectal approach does not lead to an increased rate of fecal incontinence, stenosis or infection in children with or without anorectal malformation.^{1,8,9} This aspect makes the approach for patients without ARM a viable alternative for consideration. The success that we have had using the transanorectal approach in females with a urogenital sinus anomaly and normal anus serves to further this argument.¹⁰

The concept of splitting the rectum is not the initial choice of most urologists. We believe that the exposure afforded by the posterior sagittal transanorectal approach and the minimal morbidity noted by splitting the rectum justifies this approach.¹⁰ Exposure afforded by splitting the rectum is unparalleled via any other approach (fig. 2). The rectum in ARM reoperations is usually moved out of the way to care for an associated mislocated anus, stricture or prolapse, which allows excellent exposure of the posterior urethra. In patients with a normal anus the anus and rectum are split, preserving its function after reconstruction.

We used a protective colostomy in the majority of revisional surgeries for anorectal malformation because of the need for rectal tapering, extensive mobilization or opposing suture lines. Four patients in group 1 received a protective

colostomy. There was no increased complication rate in cases that were not diverted because the rectum was only split and then precisely reconstructed to help with exposure.

Colostomy can be safely avoided in patients with a normal rectum when the bowel is adequately prepared. We use standard 1 day bowel preparation before surgery. A peripherally inserted central catheter is placed preoperatively in anticipation of total parental nutrition. Postoperatively the patient receives nothing by mouth for 7 to 10 days. We have not observed wound infections or breakdown of repair without diversion and we do not believe that diverting colostomy is necessary when these guidelines are followed. In the case of a mislocated rectum with associated ARM colostomy can also be avoided, provided that there is no need for tapering or extensive dissection.

Although longer followup and a larger sample population are needed to make definitive statements with regard to the preservation of potency, the posterior sagittal approach allows the surgeon to remain midline and away from the neurovascular bundles. In addition, there is little to no blind dissection with this approach. The preservation of potency is always a concern when addressing pelvic pathology in the setting of revisional surgery and this direct anatomical approach would likely facilitate that goal.

In our series we have also observed that continence of stool or urine is not affected by this approach. Of course, this is a concern when addressing residual pathological conditions in children with associated ARM but in a normal individual this does not apply. Although the preservation or creation of urinary continence cannot be demonstrated in every patient with ARM, one must remember the high incidence of neurological issues in children with an ARM.^{11,12} In children without an ARM the confounding variable may be the preexisting condition, especially in the setting of trauma. An important measure for assessing the value of this approach is the recurrence of pathological conditions, which we did not note in our series.

CONCLUSIONS

The posterior sagittal transanorectal approach is a safe and reasonable alternative for accessing difficult perineal anatomy, especially in the setting of revisional surgery. The few patients who have demonstrated that they are potent with intact ejaculation help further the argument in favor of this approach.

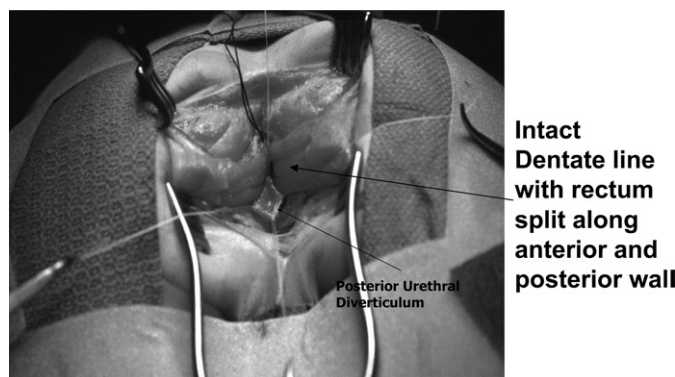


FIG. 2. Child without ARM. Müllerian remnant is easily addressed by dividing rectum.

The benefits of the posterior sagittal approach are the ability to stay midline, excellent exposure and visualization, and in this series the avoidance of an incision through prior scar (fig. 2). In our small series we observed no increased rate of damage to the urinary tract or deleterious effects on potency after surgery. The posterior sagittal transanorectal approach should be included in the decision process, especially in settings in which prior surgical attempts have failed.

Abbreviations and Acronyms

ARM = anorectal malformation

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EDITORIAL COMMENT

To me the interest of the current report centers around the 12 patients without anorectal malformation. These 12 patients include 4 with previously operated posterior urethral strictures and 8 with müllerian diverticula. It is reassuring to know that bowel and urinary control are not affected by this approach. Unfortunately these authors provide little information to understand the justification of such an approach in cases of urethral stricture. The nature of the previous operations and the length of the stricture are not reported, and data on postoperative urinary flow rates are not presented. Good results after failed initial repair can be achieved in most cases by repeat perineal anastomosis with or without partial pubectomy.^{1,2}

Regarding the excision of müllerian diverticula, it has been my experience that this operation is rarely indicated. The authors failed to mention whether these patients underwent previous hypospadias repairs or how the previously attempted excision was performed. In cases of hypospadias a symptomatic müllerian diverticulum is usually secondary to a distal urethral stricture, for which the treatment usually solves the problem. In rare cases in which excision is required the laparoscopic approach has given good results.

Finally, in difficult cases of vaginal reconstruction or rectourethral fistulas I have found the anterior sagittal transrectal approach (reference 7 in article) without diverting colostomy and with prompt resumption of enteral nutrition to be satisfactory.³

The authors again bring to our attention this approach, which expands the available options to resolve these difficult cases.

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REPLY BY AUTHORS

As stated in the article the purpose of this presentation is not to revolutionize the way in which these relatively rare pathological conditions are addressed, but rather to add to the options available to the surgeon.

With respect to the specific question concerning children with müllerian remnants, all had undergone prior abdominal or perineal attempts at repair. Of these cases 7 were associated with hypospadias, and 1 was associated with a seminal vesicle cyst and ipsilateral renal anomaly. In this group transabdominal attempts at resection failed in 2 patients. One patient had a failed endoscopic attempt at unroofing of the diverticulum. The remainder of the group had undergone multiple attempts as hypospadias repair, about half of whom were hypospadias cripples. All patients had problems with repeat infections, and 1 had an orchiectomy before presentation while 2 underwent vasectomy secondary to recurrent epididymitis. There were no documented cases of stricture after repair but several fistulas were noted in the charts.

All 4 patients in the stricture group had multiple failed attempts at repair. We agree that the perineal approach is an option, but this was already attempted in 2 of these patients without success. We acknowledge the limitation in documenting continence without postoperative uroflow studies and this is a weakness of our study. Attempts are being made to contact the patients for long-term followup.