

SURGICAL MANAGEMENT OF ACQUIRED RECTOURETHRAL FISTULA, EMPHASIZING THE POSTERIOR APPROACH

Robin P. Boushey, MD; Robin S. McLeod, MD; Zane Cohen, MD

Rectourethral fistula is an uncommon surgical entity having a variety of congenital and acquired causes. Although several surgical approaches have been proposed in the literature, successful repair is often difficult. The 2 patients described had rectourethral fistulas after radical prostatectomy. One patient failed previous transabdominal and perineal repairs. The authors propose a 3-step approach to management of acquired rectourethral fistulas. A diverting transverse colostomy with insertion of a suprapubic or indwelling silicone rubber Foley catheter for 3 to 6 months will allow for a decrease in the inflammatory response surrounding the involved area and possible spontaneous closure. If spontaneous closure does not occur within this time, the fistula should be closed operatively through a posterior approach (modified York–Mason procedure). This approach provides excellent exposure and allows the suture lines to be offset, which in turn allows for better healing, presents a minimal risk of impotence or incontinence and allows for complete separation of urinary and fecal streams. The third step involves closure of the colostomy followed by removal of the Foley or suprapubic catheter if there is no recurrence. Timing of this step is crucial and should be individualized according to the postoperative course.

La fistule recto-urétrale est une entité chirurgicale peu fréquente dont les causes congénitales et acquises sont variées. Même si l'on a proposé plusieurs techniques chirurgicales dans les publications, il est souvent difficile de procéder à une réparation réussie. Les deux patients décrits avaient une fistule recto-urétrale après avoir subi une prostatectomie radicale. Des réparations antérieures réalisées par voie transabdominale et périnéale avaient échoué chez un patient. Les auteurs proposent une stratégie à trois volets pour traiter les fistules recto-urétrales acquises. Une colostomie transverse de dérivation avec insertion d'une sonde Foley en silicone sus-pubienne ou à demeure pendant trois à six mois permettra de réduire l'inflammation de la région en cause et, peut-être, une fermeture spontanée. S'il n'y a pas fermeture spontanée pendant cette période, il faudrait fermer la fistule en procédant à une intervention chirurgicale réalisée par voie postérieure (intervention de York–Mason modifiée). Cette technique permet une excellente exposition et de décaler les sutures, ce qui améliore ensuite la guérison, réduit au minimum le risque d'impotence ou d'incontinence et permet de séparer complètement les flots urinaire et fécal. La troisième étape consiste à fermer la colostomie et à enlever ensuite la sonde Foley ou sus-pubienne s'il n'y a pas récurrence. Le moment choisi pour procéder à cette intervention est crucial et il faut le déterminer en fonction de l'évolution postopératoire.

Congenital and acquired fistulas between the rectum and lower urinary tract are uncommon. Congenital rectourethral fistulas occur in neonates with a high or intermediate imperforate anus.¹ Acquired rectourethral fistulas occur

most commonly secondary to iatrogenic injury at the time of prostatic, urethral or rectal surgery.² They have also been reported following pelvic irradiation,² in association with pelvic inflammatory processes of both infectious and noninfectious origin,³ and

blunt and penetrating trauma.⁴ Regardless of the etiology, successful management of acquired rectourethral fistulas requires a thoughtful, staged approach.

There are several surgical principles to which the surgeon must adhere

From the Division of General Surgery, Mount Sinai Hospital and the University of Toronto, Toronto, Ont.

Accepted for publication Mar. 3, 1997

Correspondence to: Dr. Zane Cohen, Ste. 451, Mount Sinai Hospital, 600 University Ave., Toronto ON M5G 1X5

© 1998 Canadian Medical Association (text and abstract/résumé)

when managing this surgical problem. First, it is essential to divert the rectal contents from the urethra. Second, further urethral injury at the time of repair must be avoided. Third, the repair must preserve both urinary and fecal continence. Fourth, the first attempt at repair is usually the most likely to succeed; subsequent repair is often more challenging technically.⁵

A rectourethral fistula developed after radical prostatectomy for localized prostatic cancer in the 2 patients described here. We discuss the use of a standardized 3-step approach for the management of a rectourethral fistula with an emphasis on the posterior approach (modified York–Mason repair) and review the advantages and disadvantages of 4 other commonly used surgical repairs.

CASE REPORTS

Case 1

A 66-year-old man underwent radical prostatectomy for localized prostatic cancer in August 1994. Dissection posterior to the prostate resulted in inadvertent rectal perforation. This was closed primarily at the time of surgery with a single layer of interrupted 3-0 chromic catgut suture. The patient was discharged from hospital 7 days postoperatively with an indwelling transurethral Foley catheter. He returned to the emergency department 2 days later because the catheter had fallen out. When it was reinserted under direct visualization, a rectourethral fistula was seen. A suprapubic catheter was inserted and total parenteral nutrition initiated. Two months later a diverting loop colostomy was established with continued suprapubic catheter drainage of the bladder. However, the fistula did not heal. In June 1995, he was referred to our centre for management of his fistula.

To evaluate the fistula, we performed an examination under anesthesia combined with urethrocytostomy and sigmoidoscopy. The fistulous tract was readily palpated and visualized 4 cm from the dentate line. In August 1995 the fistula was repaired. We used the posterior approach (modified York–Mason procedure). The colostomy was closed and gastrointestinal continuity restored 2 months later. The patient underwent cystography before the suprapubic catheter was removed in November 1995. He resumed a normal lifestyle and had normal fecal and urinary continence. The fistula had not recurred when he was seen at 8 months' follow-up.

Case 2

A 63-year-old man also underwent radical prostatectomy for localized prostatic cancer. The surgery was uncomplicated and there was no known injury to the rectum. However, the Foley catheter fell out on the second postoperative day, necessitating reinsertion under direct visualization. The Foley catheter was removed on the fifth postoperative day and the patient discharged home 2 days later. He returned to the emergency department 3 weeks after discharge with fecaluria, pneumaturia, and loose, watery stool. Urethrocytostomy and voiding cystourethrography revealed a fistulous communication between the junction of the membranous urethra and bladder neck and the rectum. A diverting transverse colostomy was done and a suprapubic catheter placed. The fistula persisted after 1 month and the patient could not tolerate the suprapubic catheter, so percutaneous bilateral nephrostomy tubes were inserted. In June 1994, operative repair was performed through a perineal approach. However, the fistula recurred. In January 1995, repair of the fistula was at-

tempted again through a transabdominal approach with interposition of omentum between the rectum and urethra. The fistula recurred.

In December 1995, the patient was referred to our centre for assessment. Preoperatively, a transurethral Foley catheter was inserted under direct visualization. Exposure was obtained using a posterior approach (modified York–Mason procedure). Primary closure of the posterior urethral opening was obtained with difficulty. Significant periurethral scar tissue from previous attempts at repair made it difficult to approximate the urethral edges. The patient had a smooth recovery and was discharged from hospital on the 10th postoperative day with the Foley catheter in place.

Postoperative voiding cystourethrography and sigmoidoscopy showed successful closure of the fistula. In May 1996, the colostomy was closed and the Foley catheter removed. At the last follow-up he was completely continent of urine and stool with no recurrence of the fistula.

THE OPERATIVE PROCEDURE

Patients who undergo rectourethral fistula repair via a posterior approach require full mechanical bowel preparation with antibiotics.⁶ A transurethral catheter should be inserted under direct visualization preoperatively. This will help to identify the fistula at the time of operation. The patient is placed in the prone jack-knife position with the buttocks strapped apart. An incision is started from the anal verge off the midline to the left side of the coccyx. In the case of a Kraske repair, the incision is made in the midline. Offsetting the incision may result in improved wound healing. The incision is then deepened through the subcutaneous tissue, and dissection is carried down until the levator muscles and external sphincter

mechanism are identified. The external sphincter is divided to provide better exposure. The muscle should be serially tagged with coloured sutures. This allows for easy identification and more exact apposition of the muscles when closing the wound. Excision of the coccyx further improves exposure and is frequently required. The anococcygeal raphe is identified in the midline as it blends with the levator muscle anterior to it. The levator muscle is grasped with forceps and incised in the midline the full length of the incision to expose, anterior to this, the fat on the posterior aspect of the rectum. The fat is incised until the posterior rectal wall is visualized. A longitudinal proctotomy is made in the posterior rectal wall between stay sutures to provide exposure of the fistula. The Foley catheter can easily be seen in the region of the fistula, and urine can often be seen leaking through the fistula and into the rectum. The fistula tract is excised and the rectal wall edges are mobilized off the urethra. 3-0 Vicryl sutures are used to close the urethra horizontally over the Foley catheter. Ideally, the anterior rectal wall is closed in 2 layers with 3-0 Vicryl. The posterior rectal wall is also closed in two layers using Vicryl suture. The entire levator muscle is then closed with a continuous suture to reconstruct the pelvic floor right up to the level of the coccyx or lower sacrum. The previously tagged external sphincter muscles are then approximated using interrupted absorbable sutures. A Jackson-Pratt drain is inserted into the subcutaneous tissue, which is closed with an interrupted layer of suture. The skin is closed with interrupted absorbable sutures.

DISCUSSION

Several authors have reported spontaneous closure of a rectourethral fistula after combined fecal and urinary diversion with transverse colostomy

and insertion of a suprapubic or Foley catheter.^{7,8} Goodwin, Turner and Winter⁷ reported spontaneous closure within 3 to 6 months in 3 of 8 patients in whom a rectourethral fistula developed after prostatectomy for benign disease. Similarly, Dahl, Howard and Middleton⁸ reported spontaneous closure in 2 of 5 patients, 4 and 5 months respectively after operation for localized prostatic adenocarcinoma.

We suggest that if spontaneous closure does not occur within 3 to 6 months after diversion, operative closure is indicated. Various surgical approaches exist. They include the transabdominal, perineal and anterior transanorectal approaches, the Parks local advancement procedure and the posterior approach (York-Mason and Kraske procedures) (Table I). Unfortunately, they have not been evaluated with equal scientific rigour, given the rarity of this condition. Selection of the type of repair is often dictated by personal preference or familiarity.

The transabdominal approach in-

volves a low midline abdominal incision and allows for interposition of omentum between the rectum and the urethra. The major disadvantages of this approach include poor exposure, risk of both urinary and fecal incontinence because of the proximity to important neural structures, and significant technical difficulty when pelvic surgery has been performed previously. Furthermore, this procedure must often be combined with a transpubic or perineal approach to provide adequate exposure when dealing with the posterior urethra. As already mentioned, this approach failed to result in successful closure in our case 2.

The perineal approach provides better exposure and also allows for interposition of healthy, well-vascularized tissue, such as gracilis muscle, between the rectum and the urethra. Hemal, Sharma and Goswami⁹ reported successful closure of 7 rectourethral fistulas with use of this approach. Major disadvantages include difficulty in dissecting tissue planes in patients who

Table I

Advantages and Disadvantages of Various Surgical Repairs Used in the Management of Rectourethral Fistula

Procedure	Advantages	Disadvantages
Transabdominal approach	Interposition of tissue	Poor exposure, urinary and fecal incontinence, poor exposure of posterior urethra, difficult dissection due to previous pelvic surgery
Perineal approach	Interposition of tissue, improved exposure	Difficult dissection due to previous pelvic surgery, impotence
Anterior transanorectal approach	Interposition of tissue, excellent exposure, posterior urethra easily accessed	Impotence
Parks local advancement procedure	No skin incision, reduced impotence	Poor exposure, limited instrument manoeuvrability
Posterior approach (York-Mason or Kraske procedure)	Excellent exposure, offsetting suture lines, minimal risk of impotence or incontinence, complete separation of urinary and fecal streams	Inability to interpose tissue between rectum and urethra

have undergone previous pelvic surgery, and impotence because of the proximity of dissection to important neurovascular structures. This approach also failed in our case 2.

The anterior transanorectal approach involves a midline perineal incision deepened to the level of the prostatic capsule. This approach allows for the interposition of dartos or gracilis muscle in a relatively bloodless field. Excellent exposure is obtained and the posterior urethra easily accessed. Once again, the major disadvantage is impotence, especially if the dissection is not carried out in the midline.

The Parks local advancement procedure involves creation of a full-thickness U-shaped flap of rectal wall above the fistula. This flap is brought down over the fistula and sutured in 2 layers to the rectal wall.¹⁰ This approach does not require a skin incision, so there is less pain postoperatively. The major disadvantages include poor exposure and limited instrument manoeuvrability.

Finally, in our opinion, the posterior approach, which includes the York–Mason and Kraske procedures, provides the best possible result with minimal risk to the patient. The spe-

cific procedure that we have performed on our patients is a modification of the York–Mason approach, which gives excellent exposure, offsetting of the suture lines for better healing, minimal risk of impotence or incontinence because the dissection is performed away from important neurovascular structures, and complete separation of the urinary and fecal streams.

Although limited, our experience with this 3-step approach to the management of a rectourethral fistula, using the posterior approach to gain access to the fistula, has been promising. We recommend that this technique be considered by all those involved in managing patients with acquired rectourethral fistulas from whatever cause when spontaneous healing does not occur.

References

1. Wiseman NE, Decter A. The Kraske approach to the repair of recurrent rectourethral fistula. *J Pediatr Surg* 1982; 17:342-6.
2. Teichman JM, Lilly JD, Schmidt JD. Rectourethral fistula caused by Kaposi sarcoma. *J Urol* 1991;145:144-5.
3. Rampton DS, Denyer ME, Clark CG, Sarner M. Recto-urethral fistula in Crohn's disease. *Br J Surg* 1982; 69(4):233.
4. Pieretti RV, Pieretti-Vanmarcke RV. Combined abdominal and posterior sagittal transrectal approach for the repair of rectourinary fistula resulting from a shotgun wound. *Urology* 1995; 46:254-6.
5. Bukowski TP, Chakrabarty A, Powell IJ, Frontera R, Perlmutter AD, Montie JE. Acquired rectourethral fistula: methods of repair [review]. *J Urol* 1995;153(3 Pt 1):730-3.
6. Smith AM, Veenema RJ. Management of rectal injury and rectourethral fistulas following radical retropubic prostatectomy. *J Urol* 1972;108:778-9.
7. Goodwin WE, Turner RD, Winter CC. Rectourinary fistula: principles of management and a technique of surgical closure. *J Urol* 1958;80:246-9.
8. Dahl DS, Howard PM, Middleton RG. The surgical management of rectourinary fistulas resulting from a prostatic operation: a report of 5 cases. *J Urol* 1974;111:514-7.
9. Hemal AK, Sharma SK, Goswami AK. Urethrorectal fistulas complicated by posterior urethral stricture: an appraisal of management by transpubic approach. *Urol Int* 1991;46(4):329-33.
10. Tiptaft RC, Motson RW, Costello AJ, Paris AM, Blandy JP. Fistulae involving rectum and urethra: the place of Parks's operations. *Br J Urol* 1983; 55(6):711-5.

À L'ATTENTION DES RÉSIDENTS ET DES DIRECTEURS DES DÉPARTEMENTS DE CHIRURGIE

LE PRIX MACLEAN–MUELLER

Le *Journal canadien de chirurgie* offre chaque année un prix de 1000 \$ pour le meilleur manuscrit rédigé par un résident ou un fellow canadien d'un programme de spécialité qui n'a pas terminé sa formation ou n'a pas accepté de poste d'enseignant. Le manuscrit primé au cours d'une année civile sera publié dans un des premiers numéros (février ou avril) de l'année suivante et les autres manuscrits jugés publiables pourront paraître dans un numéro ultérieur du *Journal*.

Le résident devrait être le principal auteur de manuscrit, qui ne doit pas avoir été présenté ou publié ailleurs. Il faut le soumettre au *Journal canadien de chirurgie* au plus tard le 1er octobre, à l'attention du Dr J.L. Meakins, corédacteur, *Journal canadien de chirurgie*, Département de chirurgie, pièce S10.34, Hôpital Royal Victoria, 687, avenue des Pins ouest, Montréal (Québec) H3A 1A1.