

# Successful Repair of Iatrogenic Rectourinary Fistulas Using the Posterior Sagittal Transrectal Approach (York-Mason): 15-Year Experience

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## Abstract

*Introduction:* Rectourinary fistulas (RUFs) represent a challenging clinical problem. Most RUFs are secondary to lower urinary or intestinal tract surgery. Several surgical approaches have been proposed. The aim of this study was to review a 15-year experience using the York-Mason posterior sagittal transrectal approach to iatrogenic RUFs.

*Methods:* Seven patients with RUFs secondary to urologic surgery were operated on with the York-Mason technique at the Department of Urology, University of Padova, Italy between 1988 and 2003. The patients' data have been collected and analyzed retrospectively.

*Results:* All the patients were treated successfully (100%). In one patient with Crohn's disease the fistula recurred 11 years after the first surgery. One patient died for metastasis of prostate cancer 1 year after surgical repair of the RUF. A temporary colostomy was performed in five patients; the colostomies were subsequently closed, and the patients regained complete fecal continence with no postoperative anal strictures. The colostomy remained in place in one patient with Crohn's disease and in another with ulcerative rectocolitis.

*Conclusions:* The posterior sagittal transrectal approach provided easy access and identification of RUFs and good surgical exposure, with no subsequent strictures or fecal incontinence. Our data show that the York-Mason technique alone is a highly effective option for treating an iatrogenic postoperative RUF.

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**R**ectourinary fistulas (RUFs) represent a challenging clinical problem. RUFs can be caused by benign or malignant disease or they can be iatrogenic. Benign causes include inflammatory bowel disease, trauma, pelvic infections, and tuberculosis.<sup>1</sup> Malignant causes include direct invasion from urogenital or intestinal cancer. Almost all RUFs result from iatrogenic causes, such as radiotherapy,<sup>2</sup> cryosurgery, brachytherapy or microwave thermotherapy for benign prostatic hyperplasia,<sup>3–5</sup>

or, most frequently, lower urinary tract or rectal surgery. In fact, consistent with the increased rate of radical retropubic prostatectomy for prostate cancer, there has been an increase in RUF incidence despite the fact that the incidence of intraoperative rectal injuries is low (range 0.5–9.0%) in most series of radical retropubic prostatectomy cases.<sup>6–9</sup>

The most common symptoms of RUF are pneumaturia and fecaluria associated with frequent voiding, recurrent cystitis, and dysuria. Gastrointestinal symptoms can occur, such as diarrhea and nausea. The diagnosis of RUF is suspected from the medical history. The fistula can

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then be identified by urethrocytography, which demonstrates contrast opacifying the rectum from the bladder. Urethrocytography and proctoscopy are mandatory to assess the morphology of involved tissues. Prior to subjecting the patient to radiotherapy, a morphologic-functional evaluation of the bladder (*i.e.*, video-urodynamic study) should be performed. Rarely, RUFs heal spontaneously, but most require surgical repair.

The two main issues regarding RUF treatment are the timing of the repair and the surgical approach. Several surgical approaches have been proposed: (1) perineal access;<sup>10,11</sup> (2) dilatation of the anal sphincter without incising it;<sup>12</sup> (3) posterior pararectal approach;<sup>13</sup> (4) transabdominal and transvescical approaches;<sup>14–16</sup> (5) transsphincteric surgical approaches;<sup>17,18</sup> and (6) a combined techniques.<sup>19</sup>

Because of the infrequent occurrence of RUFs, most surgeons are “unfamiliar” with all the surgical techniques to correct it. The posterior sagittal transrectal approach allows optimal exposure of the fistulous tract and a more straightforward excision. This approach includes many surgical techniques used to repair urethral stricture disease and hypospadias, and they are most commonly used by urologists with pediatric experience.<sup>20,21</sup> The objective of this study was to review retrospectively our clinical experience with the surgical management of RUF over the past 15 years.

## MATERIALS AND METHODS

### Materials

Between 1988 and 2003 in our department, the posterior sagittal transrectal approach based on the York-Mason procedure<sup>17</sup> was used to repair RUFs in seven patients. The mean age of our cohort was 68 years (range 60–73 years).

The commonest cause of fistula in this group was radical retropubic prostatectomy for prostate cancer, which was present in four of the seven cases (two patients were treated with radiotherapy before surgery). The other causes were transvescical prostatic adenomectomy in one case, transurethral prostate resection (TURP) in another case, and radical cystectomy and ileal orthotopic neobladder in the third case (Fig. 1).

The fistulas occurred a median of 20 days after surgery (range 1–1100 days). Clinical symptoms included recurrent urinary tract infections, watery stool, and pneumaturia in all patients. The median time between diagnosis and repair of the fistula was 6 months (range 2–144 months).

A variety of investigations (retrograde urethrography, urethrocytography, rectoscopy) were carried out to determine the diagnosis and, in the process, assess the fistula’s location relative to the urethral orifice, urinary sphincter, and rectoanal anatomy. Conservative management had failed in all cases.

All seven patients had undergone surgical repair for RUF correction in our center according to the York-Mason technique. Colostomy and suprapubic cystostomy were performed in all patients before surgery. The mean follow-up was 74.2 months (range 7–180 months).

### York-Mason Approach

When using the York-Mason approach, the patient is placed in a prone jackknife position, and tapes are used to displace the buttocks laterally. The skin is incised from the sacrococcygeal articulation to the anal verge, and the subcutaneous tissue is then divided. The layered muscular bundles of the posterior anal sphincter are divided in a layer-by-layer fashion, and pairs of chromic sutures are placed to mark these layers for reconstructing the sphincter at the end of the procedure. After the posterior anal sphincter is divided, the mucosa of the posterior anus and the full thickness of the posterior rectal wall are divided along the entire length of the incision.

The anterior surface of the rectal wall is then widely exposed, and the orifice of the fistula is well visualized (Fig. 2). A generous incision is made around the fistula, and the entire fistulous tract is excised until the urethral catheter is well exposed (Fig. 3A). The urethral defect is closed using absorbable interrupted sutures in one layer in a transverse fashion to avoid the urethral strictures that might occur if a vertical suture is employed (Fig. 3B).

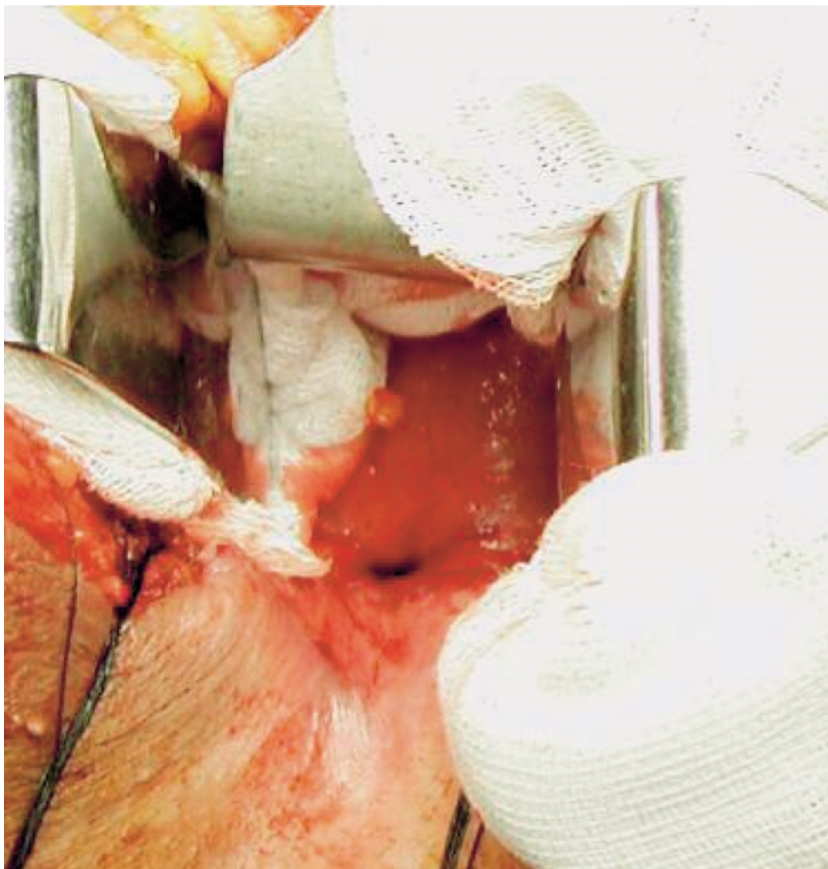
The rectal defect is sutured with the “vest over pants” technique, and the rectal mucosa is closed with one layer of absorbable interrupted sutures (Fig. 3C). The anal mucosa is closed with absorbable sutures, and all layers of the anal sphincter are sutured tightly together with extreme care (Fig. 4). The presacral fascia and other overlying tissues are closed with interrupted absorbable sutures, and a small drain is placed in the pararectal space. A postoperative retrograde urethrogram is obtained at 3 weeks.

## RESULTS

All seven fistulas in our group were repaired successfully, although the fistula recurred 11 years after surgery in one patient with Crohn’s disease. One patient died 1 year



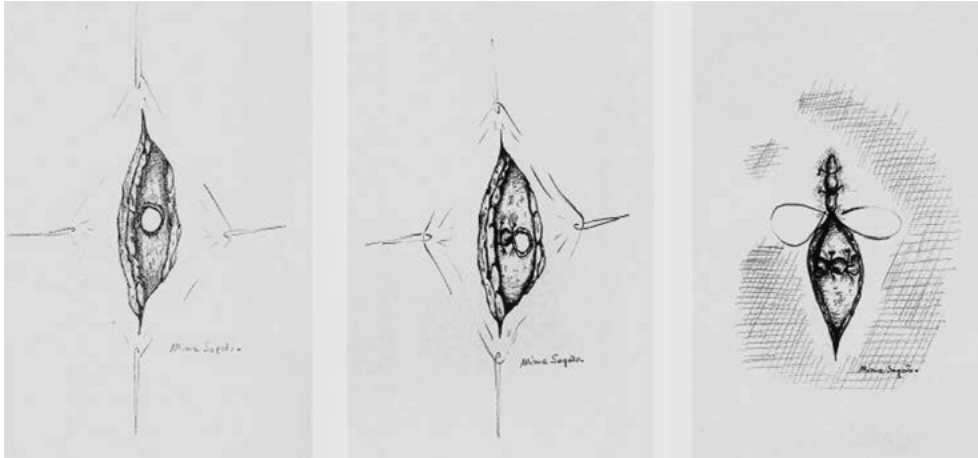
**Figure 1.** Cystogram demonstrates a rectoneobladder fistula secondary to radical cystectomy and an ileal orthotopic neobladder (Padova pouch).



**Figure 2.** Intraoperative view of the surgical field. The fistula has been well exposed.

after the procedure owing to systemic progression of prostate carcinoma. In five patients the colostomy was closed, with the patients having normal fecal continence and no postoperative anal strictures at a mean of 3.7

months (range 2–5 months) after closure of the fistula. A colostomy remains in place in one patient with Crohn's disease and in another with ulcerative rectocolitis. The mean operating time for the fistula repair was 130 minutes

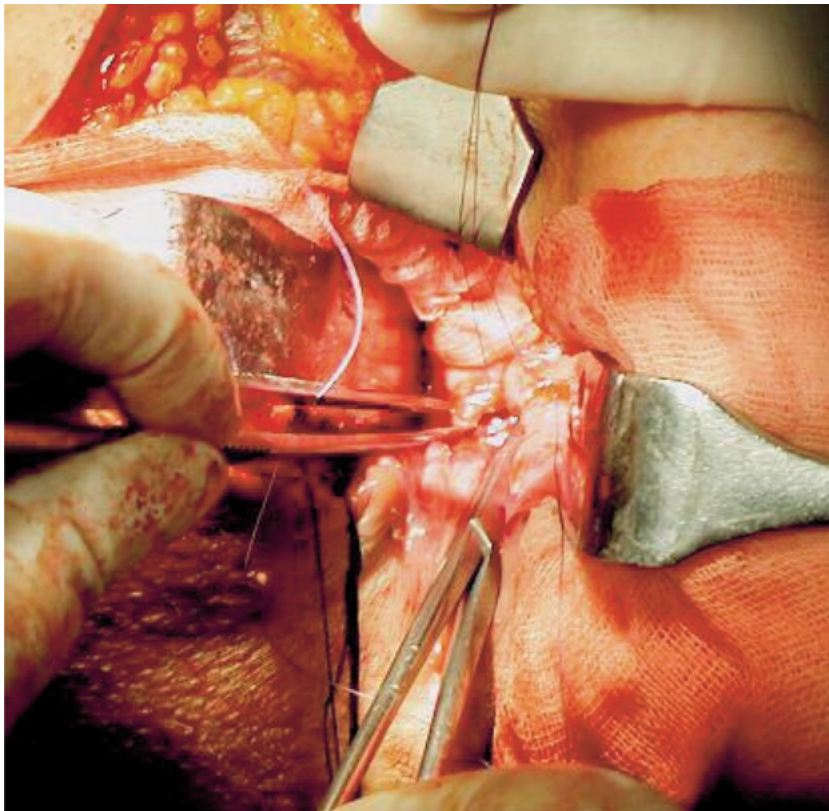


**Figure 3.** Technique for closure of the prostatic urethra.

**A.** View of the prostatic urethra after excision of the fistulous tract.

**B.** The urethra is closed with absorbable interrupted sutures in a transverse fashion in one layer to avoid urethral strictures.

**C.** The posterior rectal wall is sutured using the “vest over pants” technique.



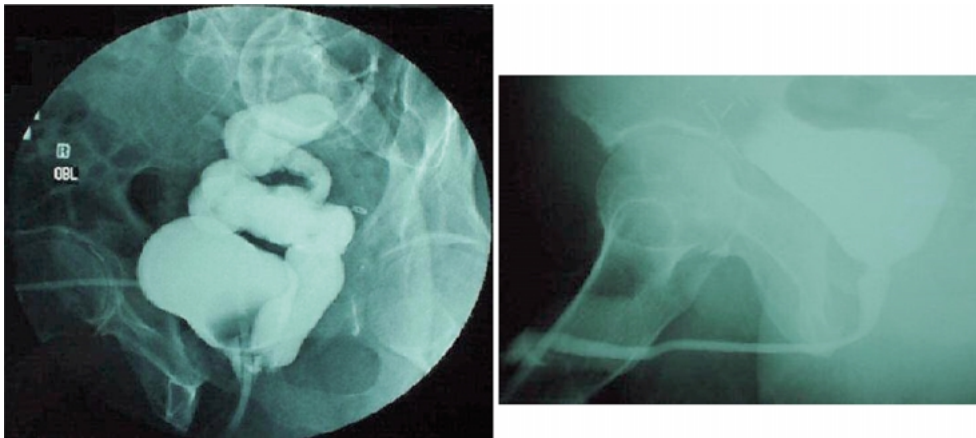
**Figure 4.** Intraoperative view. The rectal wall is being closed.

(range 90–180 minutes). The blood loss was insignificant, and no transfusion was required in any of the cases.

In all cases the drain was removed on the fourth postoperative day. The cystostomy and transurethral bladder catheter were removed 12 to 60 days after surgery (mean 25.7 days), after a control urethrocytogram showed complete closure of the fistula (Fig. 5). The hospital stay ranged from 6 to 33 days (mean 18.2 days). The only postoperative complication was a minor diastasis of the cutaneous wound, which healed after hyperbaric therapy.

## DISCUSSION

Rectourinary fistulas are a complication with a devastating impact on the patients' quality of life. Surgical repair is complex, and few data are available regarding the best surgical approach.<sup>11,12</sup> The diagnosis is usually not difficult because of the evident clinical signs, and it can be confirmed by retrograde urethrocytography, urethrocytostomy, and rectoscopy. These investigations are important for localizing the fistulous tract and determining the best management strategy.<sup>22</sup>



**Figure 5.** **A.** Cystogram shows a case of rectourethral fistula secondary to retropubic radical prostatectomy. **B.** Control cystogram of the same patient after posterior transsphincteric repair (York-Mason).

Many surgical techniques have been described to treat iatrogenic RUF.<sup>10</sup> Correct fistula repair requires good exposure to identify and excise the fistulous tract and the involved urethral segment, achieve closure of both fistulous openings, and perform the urethral repair when there is an associated stricture over a stenting catheter with wide separation of the suture lines. This maneuver must be accomplished by suturing the opposite sites of the structures involved by the fistula in such a way that the suture lines do not overlap. The role of tissue interposition in the repair of small fistulas is controversial, whereas with large fistulas it is recommended if the fistula is surrounded by necrotic tissue.<sup>23</sup>

Our treatment of choice for RUFs is the York-Mason posterior midline transsphincteric transanal approach. This technique allows easy bloodless exposure, scarless dissection, maneuverability, minimal risk of impotence or incontinence, and meticulous fistula repair even if there is a paucity of tissue for interposition.<sup>17,24,25</sup> Alternative operations for RUF treatment are summarized in Table 1.

Combined with a meta-analysis of others' experience with the York-Mason technique used alone to repair RUF, our experience demonstrates that this surgical approach is highly successful for RUF repair (the average rate of closure is 93.3%) (Table 2). Moreover, the meta-analysis of all the reported data, including ours, showed clearly that tissue interposition for successful closure is not substantial. In fact, the success rate using the York-Mason approach, which does not allow the possibility of tissue interposition in the perineum, is high despite this technical limitation. This is especially true when comparing the technique with other repairs<sup>23</sup> in which tissue interposition is always performed.

Particular attention should be paid to evaluating bladder function, especially in patients subjected to radiotherapy.

In many of those patients, an undiversion should be performed.

In all our patients, suprapubic cystostomy and colostomy were performed at the time of diagnosis. This treatment can be therapeutic for small fistulas;<sup>11</sup> in fact, in one patient the surgical repair was not necessary because of spontaneous closure of the fistulous tract. Fecal diversion, in our opinion, is mandatory to prevent systemic sepsis even though some authors have reported successful outcomes in patients who did not have a diversion.<sup>11,22,31</sup> After the surgical procedure, urine was drained by the cystostomy and a urethral catheter, which were removed approximately 3 weeks following postoperative contrast studies.

There was one extremely late recurrence of RUF in one of our patients with Crohn's disease. We believe it was an inflammatory bowel disease-linked complication.

Rectocutaneous fistulas after the York-Mason procedure occur during 5% to 7% of operations performed by experienced surgeons,<sup>22</sup> and they close almost uniformly if no distal obstruction is present. We have seen one rectocutaneous fistula, which closed spontaneously with daily medication.

Fecal continence after closure of the colostomy has been maintained in all of our patients. Meticulously identifying the layers of the anal sphincter is mandatory for obtaining this result.<sup>22,24</sup> To avoid the risk of fistula recurrence, we advocate using the layered closure, which avoids overlapping suture lines. We also suggest using transverse, not longitudinal, closure of the urethral orifice to avoid urethral stricture.

A possible disadvantage of the York-Mason approach is that it does not allow interposition of vascularized tissue flaps, in contrast with other surgical techniques (*e.g.*, transperitoneal approach), which allow interposition of the greater omentum. Our experience shows that flap inter-

**Table 1.**  
Alternative surgical approaches for iatrogenic RUF treatment

Access type	Pros	Cons
Transabdominal <sup>14,16,26,27</sup>	Availability of the omentum for interposition More familiar approach to most surgeon	Limited surgical space Increased risk of fecal incontinence and impotence Long duration of operation and hospitalization
Perineal <sup>10,11</sup>	Interposition of connective tissue More familiar approach to urologists	Increased risk of impotence Scarring may make tissue planes difficult to dissect
Anterior transanorectal <sup>28,29</sup>	Minimal blood loss	Increased risk of impotence (mandatory to stay on the midline during excision)
Perianal <sup>12</sup>	Excellent exposure Availability of tissue for interposition Lack of scarring Reduced rate of wound infection	Poor exposure Limited instrument maneuverability
Kraske laterosacral <sup>13</sup>	Excellent exposure Availability of tissue to covert the urethral defect	High risk of fecal and urinary incontinence due to denervation Stricture formation

RUF: rectourinary fistula.

**Table 2.**  
Published series of rectourinary repair using the York-Mason approach

Reference	Institution	No. of repairs	No. with successful closure
Fengler and Abcarian <sup>22</sup>	University of Illinois, Chicago	8	8 (100%)
Boushey <i>et al.</i> <sup>27</sup>	University of Toronto	2	2 (100%)
Bukowski <i>et al.</i> <sup>30</sup>	Wayne State University	3	3 (100%)
Renschler <i>et al.</i> <sup>23</sup>	University of Utah	25	22 (88%)
Present series	University of Padova	7	7 (100%)
Total	—	45	42 (93.3%)

position is not a determinant for successful treatment of RUF.

To date, there is no clear consensus over the most appropriate time to repair the RUF. Immediate repair is considered appropriate if no sepsis is present and the fistula manifests more than 6 to 8 weeks after surgery.<sup>22</sup> When the fistula occurs during the early postoperative period and signs of local sepsis are present, urinary and fecal diversion and broad-spectrum antibiotics are indicated. In our patients the fistulas occurred a median of 20 days after the original procedure, and repair with the York-Mason procedure was undertaken at a median of 6 months, although the interval has been shortened in more recent cases.

## CONCLUSIONS

The sagittal posterior transanal approach described by York and Mason to repair iatrogenic RUFs is a simple technique that offers excellent exposure of the fistula site and flexibility for urethral reconstruction compared to the

abdominal, perineal, perianal, and transanorectal approaches. With this procedure, urinary diversion by a suprapubic cystostomy and protective fecal diversion by colonostomy are recommended. Fecal continence is preserved, and no anal stricture develops if the layers of the anal sphincter are meticulously reconstructed. Urethral strictures are not seen if the urethra is closed in a transverse fashion. We believe that the York-Mason approach is a highly effective procedure for repair of iatrogenic RUFs with minimal morbidity.

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