

# Twenty-year experience with surgical management of recto-urinary fistulas by posterior sagittal transrectal approach (York-Mason)

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**Background.** We describe our 20-year experience with a posterior transrectal approach (York-Mason procedure) to treat recto-urinary fistula (RUF). Most RUFs are secondary to lower urinary or intestinal tract surgery. Spontaneous closure is infrequent, and operative treatment is often mandatory. Several surgical approaches have been proposed.

**Methods.** We reviewed retrospectively the medical records of 14 patients presenting with RUF in our Department between 1988 and 2010. In 10 patients, RUFs developed after radical retropubic prostatectomy (RRP); in the other 4 patients, RUFs resulted after other surgical interventions. All patients were treated with the York-Mason approach. A temporary colostomy and suprapubic cystostomy were performed in all patients except one.

**Results.** All patients were treated successfully. After fistulectomy, colostomies were closed after 4 mo, and patients reported fecal continence and no postoperative anal strictures. The colostomy was left in place permanently in 1 patient due to the simultaneous presence of Crohn's disease, in another with ulcerative rectocolitis, and in a third scheduled for adjuvant radiotherapy for relapse after RRP. In 1 patient, daily medications were essential because of wound infection. In the patient with Crohn's disease, the fistula recurred 11 years after first repair. Two patients died of metastatic prostate cancer 1 year after repair of the RUF.

**Conclusion.** The posterior sagittal transrectal approach allows easy access and good surgical exposure, facilitating identification of the fistulous tract. In our opinion, the York-Mason approach guarantees the greatest success rate with the least morbidity. (Surgery 2011;■:■-■.)

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FISTULAS of the urinary tract are caused by an abnormal communication between 2 epithelium-lined organs or vessels which are not usually in contact.<sup>1</sup> They are associated with substantial physical and also psychologic distress for patients. Currently, in industrialized countries, most fistulas are the result of surgical procedures. Recto-urinary fistulas (RUFs) are of great interest in the large field of urinary tract fistulas. Most RUFs are acquired and represent a rare but severe complication of rectal or urinary tract surgery or radiation therapy.

RUFs also occur in patients with inflammatory bowel disease or due to pelvic trauma. Conservative management of RUFs does not appear to be successful in most patients, and operative repair remains the best treatment.<sup>2</sup> Several operative techniques/approaches have been proposed over the years, including the York-Mason approach, a transrectal, transsphincteric procedure offering a high success rate with low morbidity.<sup>3,4</sup> We describe our 20-year experience with this procedure for the operative management of RUFs.

## MATERIALS AND METHODS

We reviewed retrospectively the medical records of all patients with RUFs surgically treated with the York-Mason procedure between 1988 and 2010 in our department. Presenting symptoms were fecaluria, pneumaturia, recurrent urinary tract infections, and/or rectal urinary leakage. The majority of patients developed a recto-urinary fistula after radical retropubic prostatectomy (RRP). The

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remaining patients had undergone transvesical prostatic adenectomy or radical cystectomy with ileal orthotopic neobladder. In 1 patient, the RUF followed several previous endoscopic procedures for a congenital urethral malformation. All patients except one were evaluated preoperatively with retrograde urethrography, cystoscopy, and rectosigmoidoscopy to confirm correct diagnosis and identify the origins of fistulous orifices. Until 2009, suprapubic cystostomy and colostomy were performed in all patients prior to the RUF repair, respectively at the time of diagnosis and 30 days before the RUF repair. Since 2010, patients have undergone only colostomy. Patients were treated with the York-Mason technique as described previously.<sup>2,5</sup> In this procedure, the patient is placed in a jack-knife position and adhesive tape is used to spread the buttocks. The skin is incised from the sacrococcygeal articulation to the anal verge, and the subcutaneous tissue is incised. The muscle bundles of the posterior anal sphincter are separated layer by layer and pairs of sutures are placed to mark the layers in order to facilitate reconstruction of the sphincter at the end of the procedure. The posterior anal sphincter is then cut. At this point, the mucosa of the posterior anus and the full thickness of the posterior rectal wall are separated along the entire length of the incision. The anterior surface of the rectal wall is thus exposed clearly using Sauerbruch retractor, and the orifice of the fistula is made clearly visible. A wide incision is made round it and the entire fistulous tract is excised, exposing the catheter inserted previously into the urethra. The urethral defect is closed with interrupted absorbable sutures (Vicryl 3-0) in 1 layer, if possible transversely, so as to minimize any urethral stricture. The rectal defect is sutured with the "vest over pants" technique, and the rectal mucosa is closed with 1 layer of interrupted absorbable sutures. The anal mucosa is closed with absorbable sutures, and all the layers of the anal sphincter are sutured together precisely. The presacral fascia and other overlying tissues are closed with interrupted absorbable sutures. A small drainage catheter is left in situ in the pararectal space for a few days. A postoperative retrograde urethrography is obtained usually after 3 weeks.<sup>2,5</sup>

## RESULTS

Between 1988 and 2010, a total of 14 patients, median age 64 years, were treated for RUF with the York-Mason technique. Ten patients developed a RUF after RRP. Fistulas occurred after a median time of 8 days from the day of operation (range, 1–1100 days). The median time from diagnosis to

corrective operation was 7 mo (range, 2–144). Median operative time was 155 min (range, 84–195) (Table I). Blood losses were minimal, and no perioperative transfusions were required. No patient developed postoperative local abscess or sepsis. One patient received hyperbaric therapy for a minor cutaneous wound infection. After a urethro-cystogram to check complete closure of the fistulous tract, the cystostomy and transurethral bladder catheter were removed on average 20 days after surgery (range, 12–60 days). With a median follow-up of 84 mo (range, 36–264), 2 patients died of disease progression and one of comorbidities. All RUFs were successfully treated. In one patient with Crohn's disease, the fistula re-occurred 11 years after repair of the RUF. In 11 patients, the colostomy was closed after an average period of 4.2 mo (range, 2–8) and no patients developed anal strictures or fecal incontinence. We found no evidence of postoperative incontinence. The colostomy remained in place in 3 patients; 1 with Crohn's disease, another patient with ulcerative rectocolitis, and a 3rd scheduled for adjuvant radiotherapy for biochemical relapse after RRP, in which sarcoma of the prostate was associated simultaneously with adenocarcinoma.

## DISCUSSION

Recto-urinary fistula is a rare condition that may be congenital or acquired. Open or laparoscopic prostatectomy for benign or malignant prostate disease is the most common cause in the development of RUFs,<sup>3,4</sup> especially in patients treated previously with rectal surgery, transurethral prostate resection, or radiation therapy.<sup>6</sup> According to recent data, the occurrence of rectal injury after RRP is 1–9%.<sup>7</sup> An increase in RUF occurrence has been associated with the learning curve of laparoscopic prostatectomy.<sup>7</sup> Acquired RUFs in men may be due to anorectal surgery, cryotherapy,<sup>8,9</sup> brachytherapy,<sup>10</sup> pelvic radiotherapy, external penetrating trauma,<sup>8,9</sup> the use of urethral instrumentation,<sup>11</sup> and also as a consequence of malignant rectal disease or locally advanced prostatic cancer,<sup>12</sup> tuberculosis,<sup>12</sup> rupture of prostatic abscess,<sup>13</sup> Crohn's disease,<sup>14</sup> cryosurgical ablation of the prostate,<sup>15</sup> and high-intensity focused ultrasound treatment.<sup>16</sup> The diagnosis of congenital RUF is infrequent and occurs almost exclusively in association with imperforate anus in children.<sup>17</sup>

The presence of a RUF may be suspected when clinical signs and symptoms such as urinary tract infections, fecaluria, hematuria, fever, nausea or vomiting, or even peritonitis and sepsis, are diagnosed. Retrograde urethrography with the voiding

phase guarantees a definite diagnosis and gives the precise location of the origin of the fistula, together with its path and extent, which are necessary parameters for correct operative planning. Upper urinary tract images are useful to image the entire urinary tract.<sup>1</sup> Cystoscopy and rectosigmoidoscopy allow visualization of the segment involved<sup>18</sup> and allow a biopsy of the fistulous margins, to exclude recurrent cancer.<sup>18</sup>

Operative repair is the best treatment, because conservative management with catheter drainage, bowel rest, and intravenous alimentation is usually ineffective.<sup>9,19</sup> Some favorable results have been reported with application of fibrin glue, endoscopic suturing, or fulguration of the fistulous tract, but reported experience is very limited.<sup>20</sup> According to Borland and Walsh,<sup>21</sup> the best way to avoid the development of fistulas is treatment of lesions intraoperatively at the time they occur—obviously if they are suspected and/or identified in time.

Operative repair of RUFs is often complex and challenging. The surgical principles which must be carefully respected are: adequate exposure of the fistulous tract; removal of devitalized and/or ischemic tissue; careful separation of the organs involved; and closure of the fistula with multilayered, well vascularized tissue to avoid infection.<sup>1</sup>

Single and differently staged techniques, possibly with the positioning of a suprapubic cystostomy tube and, almost necessarily, a colostomy, have been proposed for RUF repair. Two of the main problems concern timing and the need or other reason to perform a fecal diversion. Some authors propose a single-stage approach, with immediate repair of the RUF without fecal diversion in patients with small fistulas or those without any local abscess or infection, and in patients in whom the fistula appears later than 6–8 weeks postoperatively.<sup>5</sup> Staged repair with the creation of fecal diversion seems imperative for the large fistulous tracts, immunocompromise, previous radiotherapy, uncontrolled infections, and fistulas occurring in the early postoperative period.<sup>5,19</sup>

A variety of operative access routes have been proposed, but it is not easy to identify the ideal one, because of the relative rarity of this condition. Posterior pararectal<sup>22</sup> or transabdominal and transvesical approaches,<sup>23</sup> perineal access,<sup>24</sup> dilatation of the anal sphincter without its incision,<sup>25</sup> transsphincteric surgery,<sup>8</sup> or combined approaches<sup>26</sup> are all feasible. Each technique has its pros and cons: the transabdominal approach is more familiar for most surgeons and guarantees the availability of the omentum, which may be interposed. This approach has the disadvantages of

**Table I.** Patient characteristics

	Total
Number of patients	14
Mean age	64
Mean BMI (range)	25 (22.6–27)
ECOG Performance Status	
0	13
≥1	1
Charlson score (median and IQR)	0 (0–1)
ASA class I	12
Fistula etiology:	
Radical prostatectomy	9
Transvesical prostatic adenomectomy	1
Transurethral resection of the prostate	1
Radical cystectomy with ileal orthotopic neobladder	1
Endoscopic procedures for congenital urethral malformation	1
Days for presentation of fistula, mean (range)	8 (1–1100)
Months from diagnosis to corrective operation, mean (range)	7 (2–144)

BMI, Body mass index.

limited surgical space and the increased risk of fecal incontinence and possible later impotence.<sup>23</sup> The perineal approach is familiar to many urologists, and although the perineal approach allows the interposition of connective tissue, scarring may make tissue planes difficult to dissect.<sup>24</sup> The anterior transanorectal approach ensures excellent exposure, minimal blood loss, and the availability of tissue to interpose; but, it seems to be essential to remain on the midline during repair to avoid later impotence.<sup>27</sup> Perianal access does not cause scarring and has a decreased rate of wound infection, although the fistulous tract is not well exposed and instrumental maneuverability is potentially poor.<sup>25</sup> The Kraske laterosacral approach is associated with a high risk of both fecal and urinary incontinence due to possible denervation and the formation of strictures.<sup>22</sup>

A classification system for RUFs has been proposed, in order to identify clearly the appropriate treatment and operative approach for each patient (Table II).<sup>28</sup>

With the York-Mason approach, it is not necessary to interpose vascularized tissue flaps, in contrast with the other techniques mentioned above: that is, tissue interposition is not mandatory for successful closure.

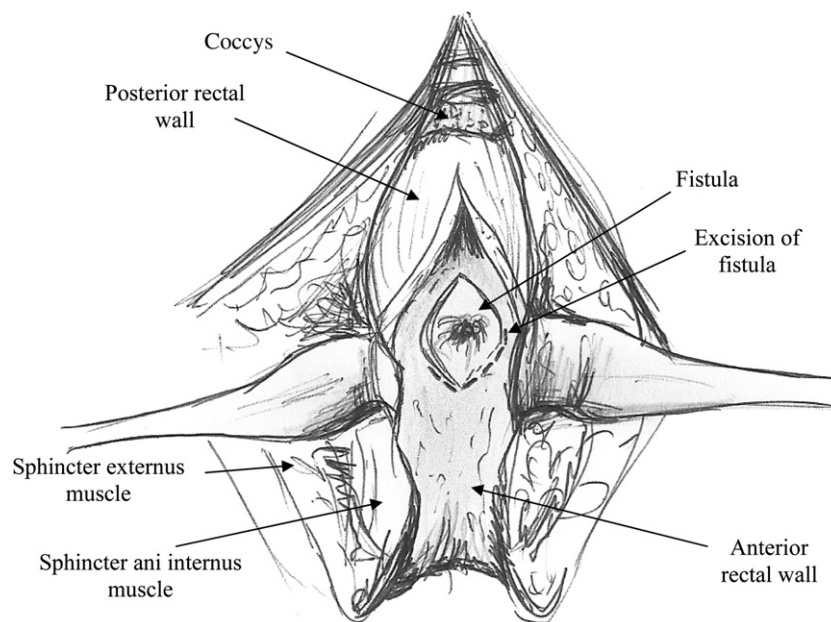
The York-Mason approach appears to enable the greatest fecal and urinary continence rates to be achieved when the various layers of the anal

**Table II.** Classification system for rectourinary fistulas

	<i>Classification</i>	<i>Treatment</i>
Stage I	Fistula located at least 4 cm from anal margin in nonirradiated tissue	Transanal repair
Stage II	Fistula located more than 4 cm from anal margin in nonirradiated tissue	York-Mason technique
Stage III	Fistula <2 cm, located in previously irradiated tissue	York-Mason technique
Stage IV	Fistula >2 cm, located in previously irradiated tissue	Perianal access route with interposition of pediculated flaps
Stage V	Large fistula, generally secondary to decubitus ulcers of ischium	Perianal access route with interposition of pediculated flaps

**Table III.** Contemporary reports of York-Mason technique for RUF repair

<i>References</i>	<i>Institution</i>	<i>Cases (n)</i>	<i>Successful repairs, n (%)</i>
Crippa et al <sup>29</sup>	Universidade de Sao Paulo	7	7 (100)
Renschler and Middleton <sup>3</sup>	University of Utah	25	22 (88)
Fengler and Abcarian <sup>5</sup>	University of Illinois, Chicago	8	8 (100)
Boushey et al <sup>30</sup>	Toronto	2	2 (100)
Stephenson and Middleton <sup>19</sup>	University of Utah	15	15 (100)
Kasraeian et al <sup>31</sup>	Montsouris Institute - Paris	12	12 (100)
Bukowski et al <sup>9</sup>	Wayne State University	3	3 (100)
Present series	University of Padova	13	13 (100)
Total		85	83 (97.6)

**Figure 1.** Posterior saggittal, transrectal, transanal approach for repairing a rectourinary fistula (the York-Mason approach).

sphincter are identified and respected.<sup>5</sup> The results of our series confirm that the posterior transrectal transsphincteric approach proposed by York-Mason allows maneuverability, excellent

exposure of the fistulous tract, scarless dissection, meticulous repair, and minimal risk of blood loss and incontinence. In addition, operative time and hospital stay are relatively short.<sup>2</sup> Our study

supports data from other contemporary reports evaluating success rates after RUF repair with the York-Mason technique (see Table III). Recurrent RUFs have also been treated successfully with this technique.<sup>31</sup>

In our experience, layered and transverse closure, avoiding overlapping suture lines, is also necessary to prevent the risk of fistula and the development of urethral strictures.<sup>2</sup> Moreover, all our patients maintained fecal continence after closure of the colostomy.

Postoperative pain and wound complications are two of the drawbacks of this approach. Rectocutaneous fistulas are described in 5–7% of patients treated with the York-Mason technique, even when the repair is performed by experienced surgeons<sup>5</sup> but, as confirmed by our experience, fistulas may close spontaneously with daily medications.

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