

Mid Term Functional Results Following Surgical Treatment of Recto-Urinary Fistulas Post Prostate Cancer Treatment

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Abbreviations: RUF: Recto-Urinary Fistula; BT: Brachy Therapy; EBRT: External Beam Radiotherapy; YM: York-Mason; ICS: International Continence Society; GFI: Gracilis Flap Transposition

Introduction

Recto-urinary Fistula (RUF) is a rare complication following prostate cancer treatment, and can have a major impact on patients' quality of life. The reported incidence of RUF following brachy therapy (BT) in older series [1] has been reported to be 1%, however in recently published series its incidence has been reported to be 0.32% [2]. Symptoms following brachytherapy can develop up to 3 years and, therefore, a longer follow up is required [3]. Of all fistula's post radiotherapy 37% are post brachytherapy, 20% post External beam Radiotherapy (EBRT) and 43% in combination of BT and EBRT [4]. The incidence of rectal Injury during radical prostatectomy ranges from 11% in older series [5] to 0.34% in recent series [6]. Treatment of these fistulas is difficult and usually requires a multidisciplinary approach. There is a lack of consensus concerning the best approach and different techniques have been proposed including endoscopic, trans rectal, perineal and trans peritoneal (open, laparoscopic or robotic). The York-Mason (YM) posterior trans-sphincteric technique [7] is most commonly used since it allows easy and rapid access to the anterior rectal wall with minimal complications. Tissue interposition by several types of flaps or bio-prosthesis has also been described as primary treatment or in the management of relapse following YM. These include gracilis [8], dartos [9] and even buccal mucosa [10]. Regardless of the type of surgical technique, the reported success rates are good, however, the impact of reconstruction on sexual function and continence (urinary and Fecal) has rarely been addressed. We describe our experience of treating RUF and the impact on Urinary and digestive Quality of life.

Materials and Methods

We retrospectively reviewed the charts of our patients who underwent RUF repair from January 2001 to December 2010.

Sixteen patients who developed RUF following prostate cancer treatment were identified. The fistula was confirmed both clinically and by imaging in all cases. All patients had follow up consultation every 3 month for the first year then annually and filled questionnaires evaluating functional outcomes. The International Continence Society (ICS) score was used to assess the postoperative urinary continence [11]. Fecal continence was evaluated with the Wexner score [12,13]. Sexual function was evaluated using the International Index for Erectile Function (IIEF-5).

Results

A total of 16 patients with a mean age of 66 (57-73) had RUF following treatment for prostate cancer. In 14 cases, RUF was diagnosed 5.8 days (1-21) following radical prostatectomy, 6 of which were open retro-pubic (RRP) and the remaining 8 were laparoscopic prostatectomy (LRP). In 2 of the 8 patients who underwent LRP a conversion to an open approach was necessary due to technical difficulties. 4 patients had rectal injury diagnosed and treated Intra-operatively and an immediate colostomy was performed in 2 of those patients. In post iodine 125 brachytherapy treatment, RUF occurred in 2 of our patients at 26 months following seed implantation. In one patient the fistula appeared following biopsy of anterior rectal wall ulceration. The second patient presented with rectal bleeding and underwent hyperbaric oxygen therapy for 2 month without improvement. All patients diagnosed with RUF had a colostomy for fecal diversion. Conservative management was attempted for a mean time of 9 months (3-20) before the surgical treatment of the RUF was performed. The posterior trans-sphincteric YM technique was the primary treatment in 11 patients. The 5 remaining patients including the two brachytherapy patients, had perineal Gracilis flap transposition

(GFI). The YM technique was successful in 8 patients (73%), while relapse of the fistula occurred in 3 patients within a mean of 32 days (5-81). Gracilis flap interposition was successful in 4 cases (80%). Complications (Grade IIIB Clavien) occurred in the two brachytherapy patients. Early flap necrosis occurred in one patient while the second patient had a periprostatic abscess and developed a vesico-cutaneous fistula one year following surgery. Surgical drainage of the abscess allowed healing of the vesico-cutaneous fistula, there was no RUF relapse.

Gracilis flap interposition was also performed in the 3 patients that relapsed following YM. RUF healing was obtained in 2 of the 3 patients. One patient presented with a urinary peritonitis that required urinary diversion with bilateral ureterostomies. The RUF subsequently healed after 2 years of fecal and urinary diversion. In this patient, the colostomy was closed, however the urinary diversion was left in place. In total, 15 of the 16 patients had successful treatment of their fistula (94%). There was no significant difference in mean hospital stay for both techniques (9.3 days for YM vs. 10.2 days for GFI). Mean bladder catheterization time from the time of the diagnosis to the healing of the RUF was 11 month for 13 patients.

Mid-term functional results were evaluated with a mean follow up of 40 months (14-92). The mean catheterization time (diagnosis to fistula closure n=13pts) was 338 days (11 months).

Major incontinence requiring urinary sphincter was present in 4 patients, this was although not performed, 7 patients had mild incontinence requiring a single pad per day, and 2 patients regained complete continence. Two patients required long term suprapubic catheter drainage for complete urethral stenosis following brachytherapy. One patient required urinary diversion with bilateral ureterostomies.

Closure of the colostomy was possible in 15 of the 16 patients after a mean diversion time of 15 months (3-46). Fistula reactivation and fecal incontinence occurred in one patient after colostomy closure, and thus required definitive fecal diversion. Parastomal hernia repair with mesh placement was required in 3 patients. Two patients had minor fecal incontinence while 12 patients were completely continent. One patient had severe fecal incontinence following closure of the colostomy. One patient required definitive fecal diversion. None of the patients complained of rectal stenosis or was noticed on digital rectal examination. Sexual function assessment revealed that only 2 patients regained sexual activity and potency with intra-cavernosal prostaglandine E1 injections.

Discussion

Fecal continence/issues with colostomy

Management of RUF usually requires diversion of urine and a colostomy since spontaneous healing without these measures is extremely rare. Many small case series have been published in the literature, these publications describe different surgical techniques and outcomes. Recently Pfalzgraf et al. [14] studied the impact of

RUF repair on sexual and urinary continence but our study to our knowledge is the only study specifically addressing the issue of faecal continence as well. Colostomy performed after the diagnosis of RUF has a major impact on patient's quality of life and is a subject of debate when managing these patients since there is no consensus in the literature about the need for it. 20 of the 36 patients in Wexner et al. [15], and half the patients in Kasraeian series [16] had a colostomy. In our study all patients had a colostomy following diagnosis of RUF. When these 3 studies are compared we find similar healing times and complications rates. Furthermore 3 of our patients (20%) had colostomy related complication i.e. parastomal hernia that required surgical repair with mesh placement. Based on these findings, it can be argued that the colostomy is not a determining factor for RUF healing and prevention of infections.

The latest published results from Hadley et al. [17] which include outcomes from 27 more cases compared to their series published in 2003 (n=24) show similar results (93 % vs. 91% success rate). In their latest series only 7/27 had bowel diversion pre operatively with identical success rates. In the series of Wexner, Ulrich [18], and Vanni [19] almost all patients underwent bowel diversion preoperatively. In the series from Vanni though, the decision to perform bowel diversion was made at the time of fistula surgery. Vanni et al. [19] also divided his cases between Irradiated and non- irradiated group and found that most failures occurred in the Irradiated group. Hanna et al. [20] in their series of 37 patients described failure to reverse colostomy to be 45% in Irradiated group, compared to only 9% in the non Irradiated group. The incidence of anal stenosis and fecal incontinence following gracilis interposition or York Mason repair is reported to be very low. In the York Mason technique, anal sphincter is cut without morbidity, as shown by Kasraeian et al. [16], who achieved 100% success rates even with redo YM repairs as none of the 12 patients they treated with YM repair developed any fecal incontinence or anal stenosis.

Irradiated pelvis appears a poor prognostic marker for reversal of bowel diversion as 50% patients in our series and 33% in Vanni's series post radiotherapy had long term bowel diversion after RUF fistula repair.

Hechenbleikner et al. [21] recently published a review article in which 416 patients were identified, including 169 (40%) who had previous pelvic irradiation and/or ablation. Most patients (90%) underwent 1 of 4 categories of repair: transanal (5.9%), transabdominal (12.5%), transsphincteric (15.7%), and transperineal (65.9%). Tissue interposition flaps, predominantly gracilis muscle, were used in 72% of repairs. The fistula was successfully closed in 87.5%. Overall permanent fecal and/or urinary diversion rates were 10.6% and 8.3%. For selected patients without associated comorbidities, absence of sepsis and a non-irradiated field, bowel diversion can be avoided thus avoiding at least two unnecessary surgeries. For certain complex fistulas post radiation treatment, presence of sepsis and patients with significant comorbidities, a bowel diversion may be required thus delaying the definitive surgery.

About the urinary function

Urinary functional result is another important factor for patients' quality of life after fistula repair. In our series, 4 out of 16 patients had severe urinary leak that would have required the placement of an artificial sphincter. However this procedure was deemed to be complex in this setting, and thus was not performed. Artificial sphincter was used in 7/74 patients in the series from Vanni et al. [19]. No special mesh for the urethra has been used in any of the published series. It is almost impossible to know the possible reasons for Incontinence in our series; this could be multi factorial either due to the treatment of prostate cancer or absence of detrusor-sphincter physiotherapy which could not be achieved. It is also impossible to know whether a perineal incision with placement of a gracilis muscle induces more urinary incontinence compared to the technique of York Mason. The two patients who presented with RUF following brachytherapy had complete urethral stenosis and required lifetime urinary diversion with a suprapubic catheter. Addition of a buccal mucosa graft to the gracilis flap interposition as described by Vanni et al. [19] might have resulted in a more favorable outcome in those patients. Vanni et al. [19] used a combination of gracilis muscle and buccal mucosal graft in irradiated patients and reported a satisfactory urinary continence in 90% cases.

About the sexual function

Following these multiple surgeries, patients' sexual function was severely damaged. In addition to the effects of the initial prostate cancer treatment, long term urinary and fecal diversion can lead to altered self-image and have a negative impact on the sexual drive. Pfalzgraf et al. [14] reported that for 10/12 patients post RUF repair could not achieve erections. All patients reported that the erectile dysfunction was unchanged compared with before the fistula repair. Erectile dysfunction does not appear to be an important issue during the course of treatment of RUF repair but we suggest initiating the rehabilitation process earlier during the repair process with the use of intra cavernosal prostaglandin injections as once the RUF repair is successful most of these patients were interested in recovery of their sexual function. Teloken et al. [22] suggested starting the rehabilitation process with intra cavernosal injections in their series during the course of treatment of RUF post radical prostatectomy. Urinary drainage with a suprapubic instead of a Foley catheter can also help enhance sexual function in these patients.

Conclusion

RUF following prostate cancer treatment is a serious complication with severe repercussion on patients' quality of life. Surgical repair with the York Mason technique or Gracilis Flap interposition is associated with good success rates. York Mason should be the preferred option for non-irradiated patients, as it is easier, faster and associated with lesser morbidity. Gracilis Flap interposition is preferred for irradiated patients as it involves replacing with healthier tissue. Avoiding fecal diversion with a colostomy, urinary drainage with a suprapubic catheter and early

Intra cavernosal Prostaglandin injections can improve patients' quality of life following surgery.

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