Case Report

Traumatic rectourethral fistula repair: A potential application of porcine small intestinal submucosa

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ABSTRACT

Rectourethral fistula is an uncommon but devastating condition. Traumatic rectourethral fistula is still uncommon and repair of traumatic rectourethral fistula involves a complex procedure. Most of the urologists would prefer to repair the fistula through perineal route especially when urethral reconstruction is also required. The repaired ends of the fistula are separated with various interposition flaps and grafts in order to prevent recurrence. Gracilis interposition muscle flap is commonly used. We describe the first case of traumatic rectourethral fistula repair in a 45-year-old man using interposition of a porcine small intestinal submucosal (Biodesign™ (Surgisis®) graft.

Key words: Rectourethral fistula, small intestinal submucosa, stricture, trauma

INTRODUCTION

Rectourethral fistula (RUF) is a rare devastating condition. It occurs due to various causes; radiation, postradical prostatectomy, complex trauma, tuberculosis, and malignancy of rectum and prostate. Traumatic RUF mainly occurs during wartime injuries and are difficult to manage due to their complexity. Various methods are used to repair RUF, the most common being the transanal transsphincteric method of repair. Urologists prefer to repair the RUF by perineal route especially when urethral reconstruction also has to be done. Interposition of the tissue flaps after RUF repair is followed by reconstructive surgeons as a method of reinforcement. We report the first case of RUF repaired successfully with porcine small intestinal submucosal graft Biodesign™ (Surgisis®) interposition.

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Access this article online	
Quick Response Code:	Website: www.indianjurol.com
	DOI: 10.4103/0970-1591.114041

CASE REPORT

A 45-year-old male met with road traffic accident a year ago and sustained pelvic fracture with urethral injury and traumatic rectourethral fistula. He underwent diversion loop colostomy and suprapubic cystostomy elsewhere immediately after injury. Six months later, he came to us for further management. He had mild difficulty in squatting and complete loss of penile erection. Clinical examination revealed normally functioning pelvic loop colostomy, well-positioned functioning suprapubic cystostomy and an indurated opening of 1 cm × 1 cm size in the anterior wall of rectum, 6 cm above the anal verge. Opposing cystourethrography revealed complete obliterative stricture at the level of proximal bulbar urethra and extravasation of contrast into rectum from bulbomembranous urethra [Panel A, Figure 1]. MR urethrogram showed a 6 cm long distraction defect with callous tissue. His blood and urine investigations were normal. Anastomotic urethroplasty by progressive perineal approach (upto inferior pubectomy) was done. The fistulous communication between the posterior aspect of membranous urethra and rectum was disconnected. Rectum was closed in 2 layers with 3-0 polydiaxonone absorbable sutures. Bulboprostatic anastomotic urethroplasty was done by the parachute technique. Porcine small intestinal submucosal graft (Biodesign™ (Surgisis®) 4-Layer Tissue Graft, Cook Medical Inc. Bloomington, USA) was used for interposition

between the repaired ends of urethra and rectum [Figure 2]. He was on continuous per urethral catheter for 8 weeks. After catheter removal, he voided well with a peak flow of 36 ml/s at a voided volume of 560 ml. Post-operative voiding cystourethrogram [Panel B, Figure 1] revealed well-healed bulboprostatic urethral anastomosis and absence of contrast extravasation. Subsequently he had loop colostomy closure 6 months later. At follow-up of 1 year, he is voiding well.

DISCUSSION

Rectourethral fistula (RUF) is a rare, but devastating condition. They may be of varied etiological factors: Congenital, iatrogenic, inflammatory, neoplastic, or traumatic etiologies.[1] Traumatic RUF is often seen in wartime injuries[2] and is accompanied with extensive urethral injury which leads to extensive stricture. Traumatic RUF can cause challenging problems in surgical reconstruction. As this condition is very uncommon, no single procedure has been proven most effective and become the technique of choice. [2] Spontaneous closure of the RUF after double diversion or by means of a one-stage procedure is possible only in a few cases. In most cases, the treatment proceeds in three stages (double diversion – urinary and bowel, closure technique, undiversion). RUF is being repaired by various techniques; York-Mason inter-sphincteric approach is the common technique used for repair.[3] Transperineal approach is often used by urologists for the repair of RUF. It allows for complete exposure of bladder neck and prostate and allows for urethral reconstruction after repair of RUF. It also helps in interposition of various grafts. Interposition grafts are used as a second layer of reinforcement after closure of RUF *to prevent recurrence due to proximity of overlapping suture lines*. Many interposition grafts are used for this purpose: Gracilis muscle, dartos muscle, tunica vaginalis flap, penile skin, levator muscle, and bladder. Harvesting these tissue flaps are associated with complications like hematoma formation, infection, and wound dehiscence. Surgisis® (Cook Surgical, Bloomington, IN) is a naturally occurring, acellular, resorbable biomaterial derived from the extracellular matrix of porcine small intestinal submucosa. It is a three-dimensional matrix comprising collagen, non-collagenous proteins, and other molecules, including glycosaminoglycans, proteoglycans, and glycoproteins. Surgisis® is vacuum dried, packed, and sterilized to ensure minimal transmission of bacteria, viruses, and prions. It acts as a scaffold for the surrounding tissue to grow, supports vessel growth, and fosters cellular differentiation and gets completely incorporated in it.[4] Surgisis® is being used for various purposes in urology; urethral reconstruction,[5] ureteric reconstruction,[6] urethral diverticular surgery,[7] bladder neck fistula closure after exstrophy repair,[8] surgery for peyronie's disease, penile prosthetic surgery,[9] and nephron sparing surgery.[10] Surgisis® is available in various sizes and for RUF closure, a 7 cm × 4 cm size fistula repair product (G13181) (http://www.cookmedical.com/sur/dataSheet.do?id = 5643) was used. Its costs about $103 (Rs. 5330). It is cost effective as effective healing takes place and thereby recurrence and retreatment cost is avoided.

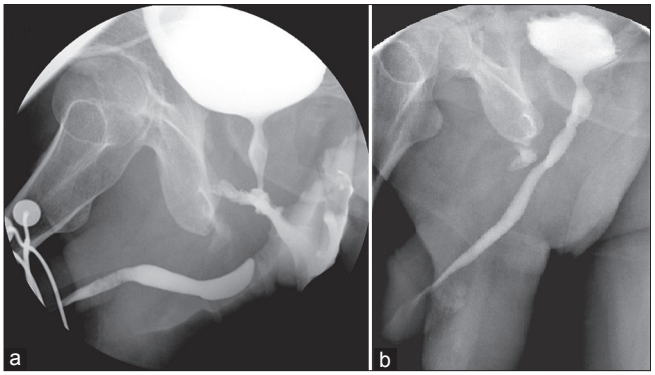

Figure 1: (Panel A) Opposing Cystourethrogram delineates the communication between the bulbomembranous urethra and rectum with urethral distraction defect. (Panel B) Postoperative voiding cystourethrogram showing completely healed anastomosis with the absence of contrast extravasation into rectum

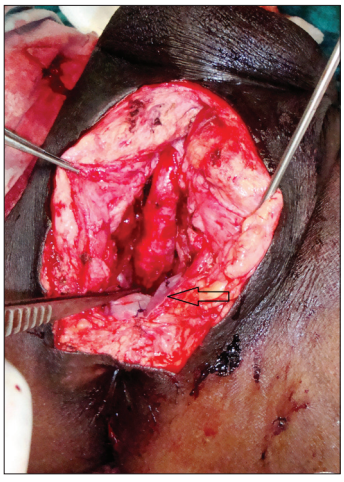

Figure 2: Completed bulboprostatic urethral anastomosis and interposition of Biodesign™ (Surgisis®) graft between the urethra and rectum (hollow arrow)

We describe a case where Surgisis® was used for rectourethral fistula closure. Upto our knowledge, our case is the first of RUF repair with Surgisis® noted in the literature. The technique adds one more option of reinforcement to the armamentarium of reconstructive surgeon involved in repair of rectourethral fistula. It adds to the advantage of avoiding morbidity associated with harvesting other tissue flaps (e.g., Gracilis). Further larger series is necessary to confirm the efficacy of porcine small intestinal submucosa in the repair of rectourethral fistula.

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How to cite this article: Rajaian S, Rajadoss MP, Nayak S, Kekre NS. Traumatic rectourethral fistula repair: A potential application of porcine small intestinal submucosa. Indian J Urol 2013;29:148-50.

Source of Support: Nil, **Conflict of Interest:** None declared.