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Recurrent Congenital Rectourethral Fistula Repair Using Gracilis Muscle Flap Interposition

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Abstract **Original Research Article**

Aim: Congenital rectourethral fistulas are rare and poses a difficult surgical challenge. Fistula between the lower rectum and the urethra due to congenital cause associated with the constellation of pelvic floor malformation. Although symptoms such as pneumaturia, faecaluria, and the passage of urine through the rectum are often alleviated by faecal and urinary diversion, these fistulas seldom spontaneously heal. Even when diverted, patients may suffer from urinary tract infections, resistant to the medical therapy. Thus, most of these patients will eventually require surgical treatment. ***Methods:*** Two patients with RUF at age of 16 and 21 years who underwent multiple (2 and 7) unsuccessful reconstructive attempts were referred to our department. The repair was performed with gracilis muscle flap interposition through perineal approach. All these two patients had colostomy and suprapubic cystostomy prior to definitive surgical repair to 6 months before. The surgical technique used was excision of the fistula and repair of the rectal and urethral defects with interposition of the right gracilis muscle flap. ***Results****:* The follow up periods of the two patients were eight and ten months. All the patients have been dry and continent. The colostomy and suprapubic cystotomy were closed in these two patients after five months. ***Conclusion:*** The gracilis muscle flap interposition is a viable treatment option for congenital RUF. The flap is rotated easily into the perineum, brings vascularized muscle to operated site and is a mechanical barrier between the urethra and rectum. It is associated with low morbidity and a high success rate.

Keywords: gracilis muscle interposition. Perineal approach, rectourethral fistula, recurrent, congenital.

INTRODUCTION

Recto-urethral fistula (RUF) is a rare surgical condition with varying etiologies with major physiological and psychological effect. They may be congenital or acquired as the result of inflammation, infection, neoplasia, or trauma [1]. Although symptoms, such as dysuria, pneumaturia, fecaluria, and the passage of urine through the rectum, often are alleviated by fecal diversion, these fistulas seldom heal spontaneously [2]. The diagnosis is established by clinical presentation with digital rectal examination, cystoscopy, proctoscopy and micturating cystourethrogram (MCU) which establish the diagnosis can also delineate the fistulous tract. Most patients with rectourethral fistulas require surgical treatment. Numerous procedures have been described [3-6]. Nevertheless, there is no consensus in the literature regarding the treatment of these fistulas. There is very high incidence of recurrence after treatment of RUF. Recurrent RUFs are more complex due to poor vascularity and tissue scarring. The success rates decrease with each additional attempt. The gracilis muscle, situated at the medial aspect of the thigh, and several other thigh and buttock muscles have been used for interposition [7]. However, unlike these other muscles, the gracilis has vestigial function, yet has a proximal single pedicle permitting convenient perineal reconstructions. We present our experience with treating RUFs in two patients' trough perineal approach using gracilis muscle flap interposition [8].

MATERIALS AND METHODS

The current study included two patients with congenital recurrent RUF who were operated previously outside of our institution by using local tissues and underwent repair using gracilis muscle flap interposition at our institution from March 2024 to October 2024. Data on age, clinical presentation, etiology, prior surgical intervention, diagnostic workup, surgical procedure performed, perioperative complication and follow-up were recoded. A written informed consent was obtained from the two participants of this study.

First patient's age was 23 years and 2nd patient's age was 16 years. In both patients' perineal

examination and digital rectal examination was done. MCU and RGU was done which revealed the fistula tract between urethra and rectum and followed by preliminary cystoscopy and examination under anaesthesia to identify any congenital anomaly of the urethra. In first patient there was small diverticulum in prostatic urethra proximal to fistula and in 2nd patient there was duplication of the anterior urethra type I were managed simultaneously by division of the intervening septum with RUF repair. Then patients were undergoing suprapubic cystostomy (SPC) and diversion colostomy [9] followed by definitive repair after 3 months.

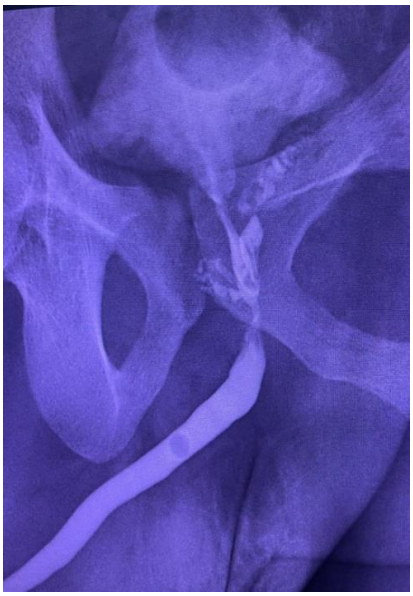

Figure 1: MCU showing RU fistula

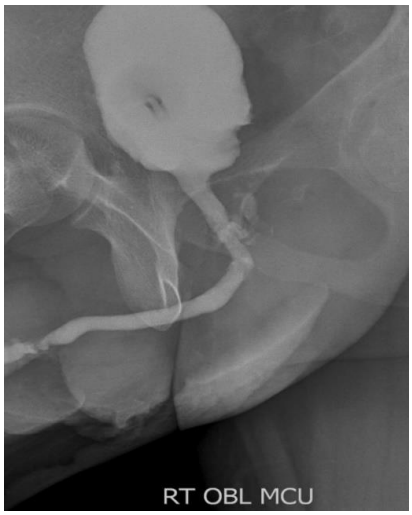

Figure 2: showing RU fistula

SURGICAL TECHNIQUE

Patients were placed in the lithotomy position. Cystourethroscopy was performed and guidewire was passed through the fistula into the rectum. Inverted Y incision was made in the perineum. The incision was deepened to make between rectum and urethra [10]. The fistula tract was then identified and excised. After excision of fistula urethral opening closed with 4-0 PDS after placement of 16 Fr all silicone catheter and rectal defect closed with 4-0 PDS. The incision was deepening at least 3 cm above the fistula. The longitudinal skin incision was made along the medial aspect of the thigh, and the gracilis muscle was released from its tibial insertion [11]. It was then dissected while preserving the proximal dominant neurovascular pedicle and other distal minor pedicles were sacrificed. The muscle was rotated over the proximal neurovascular pedicle and its distal end brought to the perineal area through a subcutaneous tunnel. It was laid between the urethra and rectum and fixed at least 3 cm above the fistula site. Haemostasis secured and placement of drain at flap harvesting site and at the perineum. The drains were removed when output was less than 20ml in a day. The urethral catheter was removed after 6 weeks after doing MCU and RGU and the suprapubic cystostomy after 7 weeks following successful voiding. In both patient right

gracilis muscle flap was harvested. The operative times were 215 and 205 min. Stomal closure was performed after 3 months of post operative period.

Figure 3 showing RU fistula

Figure 4 showing Gracilis flap

Figure 5 showing flap placement

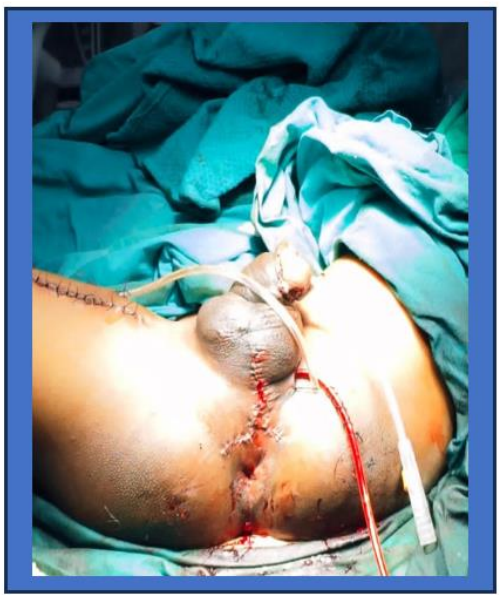

Figure 6 showing post op picture

OUTCOME

The success rate was measured as percentage of patient with healed fistula after stoma closure.

RESULTS

RUF closure was successful in both the patients. The follow-up for 1st case was 10 months and for 2nd case it was 8 months. Both patients are dry without any incontinence. There were no intra-operative complications and no problems related to muscle disinsertion. No patient had bowel complaints.

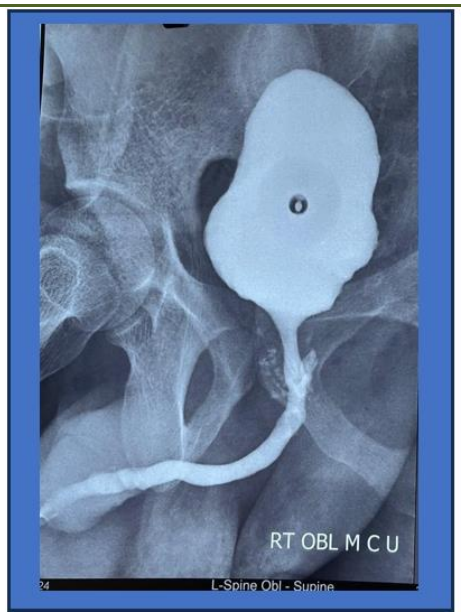

Figure 7 post op MCU no fistula

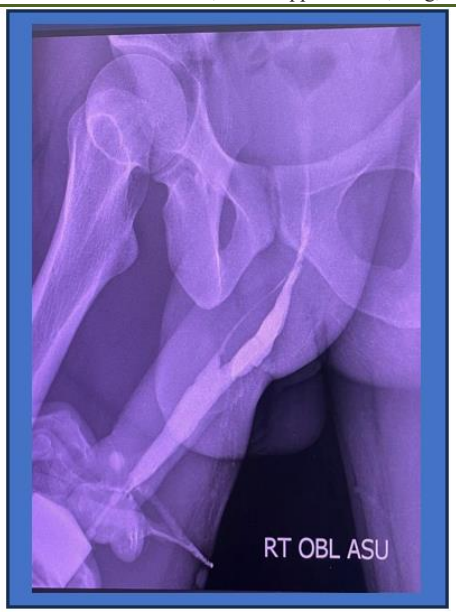

Figure 8 post op MCU no fistula

DISCUSSION

Congenital rectourethral fistula are generally debilitating and often persistent to repeated repair procedures. Various surgical procedures have been suggested for the repair of these fistulae, including fecal diversion, primary repair, endorectal advancement flap, coloanal sleeve anastomosis, and transposition flap [12]. All these procedures have varying success rates, and none of them has established their superiority over other. The perineal approach is the method of choice for urologist because of their familiarity with this approach and because urethral pathologic features can be corrected simultaneously. The principles of fistula repair are good exposure to identify and excise the fistulous tract and closure of the fistulous opening with interposition of healthy tissues when available. The proximal urethra is supplied by bulbar urethra and circumflex cavernosal arteries and the distal part of urethra is supplied by the vascular network from dorsal penile artery. This vascularity becomes compromised due to prior surgeries that leads to failure of urethral repair, urethral strictures and fistula formation. Muscle flaps are effective vascularizing agent which inducing neovascularization in an ischemic recipient bed and promote healing of wounds. The gracilis muscle flap is an effective and versatile pedicled flap for reconstruction in perineal region [13]. It has reliable vascularity, can be harvested easily and mobilised to perineum without tension with no significant donor site morbidity [14]. For that gracilis muscle has been used to repair various perineal problems, including urinary fistula repair after proctectomy, rectovaginal and vesicovaginal fistulas following pelvic radiation therapy and persistent perineal sinuses after proctocolectomy [15]. As evident in our study, the gracilis muscle flap repair successfully done in both cases with a 100% success rate with good outcome. The limitation of our study is a small sample size. Large prospective studies are required for better evaluation of the role of gracilis muscle flap interposition in the management of congenital rectourethral fistula repair.

CONCLUSIONS

The results of our study have shown that congenital RUF closure using the perineal approach with pedicled gracilis muscle flap interposition is associated with a high success rate (100%) and low morbidity and in this approach urethral pathologies can be corrected simultaneously. We emphasise the need for bowel diversion before attempting reconstruction. Other technical features include mobilization of the flap to a level of at least 3 cm above the fistula site and a tension-free interposition of the well-vascularised gracilis muscle. Nevertheless, the gracilis muscle interposition is an option for treatment of congenital RUF.

Ethical Committee Approval: It is a retrospective study and analysis of the patient's medical record and followed up of the patients, the authors did not seek for ethical committee clearance.

Conflict Of Interest: The authors have no conflict of interest to declare.

Source Of Funding: There is no source of funding to disclose.

Authors' Contributions: Manas Sasmal, in association with Sauvik Debnath, Dawood Khan, and Tapan Kumar Mandal, conceptualized and designed the study, as well as wrote the manuscript. In addition, he conducted the clinical and experimental studies and analysed the data.

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