Original Article

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Management of Small Urethrocutaneous Fistula by Tight Ligation with Fulguration of the External Epithelium of the Tract

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***Background/Purpose**: Urethrocutaneous fistula (UCF) is the most common reported complication of hypospadias repair. The success of the operative technique is usually measured by its effectiveness in reduction of the incidence of UCF.*

***Materials & Methods**: In a prospective study, 11 patients with 12 small caliber fistulae were included. After identifying the fistulous opening, the fistula tract was circumferentially and meticulously dissected ,then the dissected tract was lifted up and the base was ligated tightly with 5/0 vicryl, the external epithelium of the dissected tract was fulgurated with the diathermy, then a second layer of local soft tissue was secured over the ligated fistula with 6/0 vicryl, followed by overlapping skin closure over the ligated stump with 5/0 vicryl rapid . Dressing with fucidin -tull and pressure dressing was applied to be removed after 24h with removal of the urethral catheter. Meatal stenosis and urethral stricture distal to the fistula was excluded in all the patients, except in one patient who was having meatal stenosis who had meatoplasty in the same time.*

***Results**: All fistulae healed nicely with no recurrence over 6 months follow up period.*

***Conclusion**: tight ligation of the UCF with fulguration of the epithelium of its tract is effective and successful in treating the small caliber UCF. It is non-time consuming, and not associated with any urethral stenosis or obstruction at the site of the ligated fistula.*

***Index Word**: Penile fistula, urethra-cutaneous fistula, ligation, hypospadias.*

INTRODUCTION

Urethrocutaneous fistula (UCF) formation following hypospadias repair remained a real concern of pediatric surgeons, pediatric urologists and plastic surgeons who deal with hypospadias patients. They frequently modify their techniques of hypospadias repair to prevent fistula formation by using finer suture material, utilizing a magnifying loupe, inversion of the urethral mucosa, avoidance of any overlapping suture lines, adding layers of soft tissue coverings and sealing the repair with fibrin glue. These refinements and modifications of the techniques could reduce the previously reported high incidence of the fistula but did not completely prevent it [1-5].

Once the urethrocutaneous fistula (UCF) is established, the attention is directed to select the appropriate method to repair it , depending on the location, size, number of the fistulae, the distance between the multiple fistulae, and the availability of soft tissue for reinforcement of the repair with second

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or multiple layers coverage with or without sealant glue [5-10].

Our aim is to present our successful experience in repairing the small caliber (<2mm) fistulae by simple and tight ligation of the fistula with diathermy fulguration of the epithelium of the tract of the fistula with overlapping the skin over the ligated stump.

PATIENTS AND METHODS

In a prospective study, 11 patients with 12 small caliber (<2mm) fistulae (including the minute and pinpoint fistulae) were included. All the fistulae were primary, developed after the first hypospadias repair; none of them was recurrent fistula. Minimum of 6 months from the time of the hypospadias repair was waited before considering surgical repair of the fistula. Six fistulae were minute, with a complaint of dripping of urine seen during micturation. The other six were small caliber fistulae with complaint of thin ventral stream of urine other than distal meatal stream(Fig. 2C) and were obvious on inspecting the ventral aspect of the repaired urethra (with calibration of less than 2mm in diameter). One patient was having another large caliber distal fistula was not treated with ligation as it was not amenable for treatment with this technique (Fig. 2 A&B). All patients were seen at pediatric and plastic surgery outpatient clinics at King Abdul-Aziz university hospital, Jeddah, Saudi Arabia. Intra operatively, irrigation of saline into the urethra with gentle proximal pressure was used to confirm and locate the fistulae and to exclude the possibility of other fistulae. Nine patients were only having distal small penile fistulae, while two patient were having two fistulae, one proximal and one distal penile , one of them was having the none counted large caliber distal fistula and meatal stenosis.

After identifying the small caliber opening, size 10F urethral catheter was inserted to avoid tenting and stenosing of the urethra at the site of ligation of the fistula. The fistula tract was circumferentially and meticulously dissected (Fig. 1A &2D), then it was lifted up and the base was ligated tightly with 5/0 vicryl (Fig. 1B & 2D). The epithelium of the dissected tract was fulgurated with the diathermy using fine tip probe (Fig 1C&2E) .

Fig. 1-a: the fistula circumferentially and meticulously dissected

Fig. 1-b: the fistula tightly ligated with 5/ vicryl over the 10 F urethral catheter

Fig. 1-c: the external epithelium of the fistula tract fulgurated with diathermy using fine tip probe

Fig. 1-d: the stump of ligated fistula covered with second layer and overlapped with the skin

Fig. 2-a: one large distal fistula (not repaired by ligation), and another small proximal peno-scrotal fistula

Fig. 2-b: the distal large fistula measures 5 mm with meatal stenosis

Fig. 2-c: irrigation through the distal large fistula with proximal pressure showing the saline steam through the small penoscrotal fistula

Fig. 2-d: the fistula circumferentially and meticulously dissected and tightly ligated with 5/O vicryl over the 10 F urethral catheter

Fig. 2-e: the external epithelium of the lgated fistula tract fulgurated with diathermy

Fig. 2-f overlapped skin, over the fistula stump. the large distal fistula was repaired and the meatal stenosis was corrected

The ligated fistulae were tested for any leakage by re-irrigation of saline into the urethra with gentle proximal pressure or rubber tourniquet on the urethra, and then the catheter was pushed again to the bladder. A second layer of local subcutaneous soft tissue was secured over the ligated fistula with 6/0 vicryl with the stump directed proximally, followed by skin closure overlapping the stump of the ligated fistula with 5/0 vicryl rapid (Fig 1D&2F). Dressing with fucidin-tull and pressure dressing was applied to be removed after 24h with removal of the urethral catheter. Meatal stenosis and urethral stricture distal to the fistula was excluded in all the patients except in one patient who was having small proximal and large distal fistulae and meatal stenosis which was corrected by meatoplasty in the same time (Fig 2F).

RESULTS

All the 11 patients with 12 small caliber fistulae were treated with the tight ligation of (UCF) as inpatients. Ten patients were hospitalized for 24h but the one who had meatoplasty was hospitalized for 48h. The average operative time was 35minutes for the 9 patients with single small fistulae and 55minutes for the patient with two small fistulae while the patient with one small and one large fistula and meatal stenosis needed 65 minutes for ligation of the small fistula and repair of the large fistula and the meatoplasty with glanuloplasty. No recurrence was seen in all of them with follow up for 6 months.

DISCUSSION

Urethrocutaneous fistula (UCF) is the commonest post operative complication of hypospadias repair and remains the main concern of the surgeons dealing with such congenital abnormality [2]. The success of the operative technique has been measured by its efficacy in decreasing the incidence of UCF. In spite of all the efforts to prevent the fistula formation, it is obvious that these efforts were effective in decreasing the incidence of the (UCF) over the last 2 decades by modifications and refinements of the techniques but did not completely prevent it [5]. We believe, as others, that the size of the fistula, its location and the availability of the soft tissue for multilayers repair are factors that would determine the appropriate manner of repair and the outcome, but exclusion of distal urethral stricture or meatal stenosis is mandatory to avoid the recurrence [2, 11]. Many techniques were used to treat the (UCF) with variable outcome [5-14] but recurrence still seen after repair [5,15,16].

Here, we are reporting our successful experience in repairing the small caliber (UCF) by simple tight ligation of the base of the dissected fistula tract and fulguration of the fistula tract epithelium to prevent possible inclusion cyst, with overlapping the skin over the ligated stump with the open end of the stump directed proximally. This ligation proved to prevent any leakage of the pressured saline irrigated urethra at the repaired fistula site even before applying the second layer over the stump of the ligated fistula ,which indicates the suitability of this ligation in cases

with deficient subcutaneous soft tissue such as the coronal fistulae. This ligation did not cause urethral stenosis or internal urethral obstruction as it ligates the tract outside the urethra without inverted tissue inside the lumen unlike the PATIO (preserve the tract and turn it inside out) repair, where the preserved fistula tract turned into the urethral lumen [11,12]. We apply local soft tissue second layer over the stump of the ligated fistula and we did not use multiple layers coverage or fibrin glue to seal the fistula as reported by others [5-8,10,14-16]. We believe that overlapping the skin over the stump of the ligated fistula is an added factor in preventing recurrence. We insert size 10F urethral catheter to ligate the fistula over it avoiding any tenting and stenosing of the urethra, and also to stent the urethra for 24 h while the patient is in hospital.

CONCLUSION

We found this simple tight ligation of the UCF, with diathermy fulguration of epithelium of external fistula tract is an effective and successful method in treating the small UCF, non-time consuming, and not associated with any urethral stenosis. But further confirmation of its efficacy is needed with larger series of patients, longer follow up period, and in treating the recurrent fistulae.

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