

Tunica vaginalis flap – is it a better surgical choice for urethro-cutaneous fistula following circumcision?

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Objective: To study the effectiveness of tunica vaginalis flap in repair of post circumcision urethro-cutaneous fistula. **Materials and Methods:** The current study reviewed all patients having surgical repair of post-circumcision urethrocutaneous fistula from December 2014 to April 2019 at our institution. **Results:** Ten cases presenting at age 5 to 22 years were operated. Most [60%] of the circumcisions were performed by a doctor at peripheral hospitals and others were done by traditional circumcisers. All cases had a single fistula and the size was more than 5mm in all cases. Three-layered fistula closure was done in all cases using the tunica vaginalis flap as the second layer for closure. There was no recurrence in any case. **Conclusion:** Use of Tunica vaginalis flap for repair of post circumcision urethro-cutaneous fistula is a highly effective technique regardless of size and site of the fistula. It is a simple procedure without any postoperative complications and without any recurrence.

Keywords: Circumcision, Complication, Repair, Tunica-vaginalis flap, Urethrocutaneous fistula

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Introduction

Circumcision is the surgical procedure that involves removal of the skin covering the tip of the penis, also called preputium, baring the glans penis. Most commonly circumcision is performed because of religious causes, followed by refractory cases of physiological phimosis.

There remains a lot of controversy regarding benefits of circumcision, however, because of some of its approved benefits like prevention of HIV transmission, helping in urination, decreasing the risk of paraphimosis, decreasing cancer risk, giving good cosmetic image, and maintaining penile hygiene, it has been accepted [1].

Like any other surgical procedure circumcision also has many complications however bleeding and infection are major complications [2,3]. Urethro-cutaneous fistula, not a very common complication, in developed countries, however, sub-Saharan and underdeveloped countries report a high rate of urethro-cutaneous fistula following circumcision, mainly because of unsterile conditions and performance of the procedure by untrained persons [4,5,6].

Surgical repair is necessary for treatment and different techniques described for repair include primary closure, modified Mathieu's technique using dartos muscle flap, and Snodgrass repair [7]. Tunica vaginalis flap is a versatile flap readily available, easy to obtain without causing any harm to the testis, and has been already in use for hypospadias repair. The present study tried to utilize this versatile flap for repair of urethro-cutaneous fistulas as this flap has shown very good results in hypospadias surgery.

The main purpose of this study is to highlight the effectiveness of tunica vaginalis flap repair as an easy acceptable alternative to accepted surgical techniques of post circumcision urethro-cutaneous fistula repair.

Materials and Methods

Setting: Patients of urethro-cutaneous fistula coming to the urology OPD of SSKM Hospital

Duration of study: December 2014 to April 2019

Type of study: Retrospective

Inclusion criteria: All patients with post circumcision urethro-cutaneous fistula

Exclusion criteria: Patients not giving consent

Data collection: Performed using parameters of patients age of circumcision and presentation, method of circumcision, circumcisers, number, location and sizes of fistulae, the techniques of repair and postoperative outcome

Surgical procedure: Delayed repair in all cases was performed under general anesthesia. Ceftriaxone 50 mg/kg was given as prophylactic at the induction of anesthesia. The pubic, penile, and perineal regions were properly cleaned and scrubbed before the operation. The operative field was painted with a povidone-iodine solution from the upper abdomen to mid-thighs. Drapes were placed, exposing only the penile region. A stay suture, silk 4/0 on a round bodied needle, was taken from the glans vertically.

A silicon catheter was placed in the bladder per urethra. A tourniquet was applied at the base of the penis. The fistula was marked and an elliptical incision was made around it. The skin around the fistula was undermined. Tunica vaginalis flap was dissected. The fistula was repaired using Vicryl 6/0 on a round bodied needle, by turning down the edges of the urethra. The edges were completely inverted in a watertight fashion.

The suture line was covered by tunica vaginalis flap brought in the field through a tunnel in the skin, taking care not to superimpose the suture line. A rotational skin flap was brought over the dartos flap as a third layer. Bipolar diathermy was minimally used for hemostasis.

The tourniquet was removed and a gelonet dressing was placed, covered by gauze dressing. The dressing was changed on the second post-operative day. The catheter was retained for seven days

Ethical consideration: Ethical clearance taken from the ethical committee of SSKM Hospital

Statistical analysis: performed using IBM SPSS 19 software

Results

Ten patients underwent tunica vaginalis flap repair for post circumcision urethra-cutaneous fistula during the mentioned time period in our hospital.

The clinical characteristics of all these patients have been summarized in Table 1.

Table-1: Clinical characteristics of patients with post-circumcision urethrocutaneous fistula.

Clinical variable	Frequency	Percentage
Total patients	10	100
Circumcisers		
Doctor	6	60
Traditionalist	4	40
Age at circumcision		
After 1 year	10	100
Location of fistula		
Corona	10	100
Number of fistulae		
One	10	100
Size of fistula		
> 5mm	10	100
Fistula surgery		
Tunica vaginalis flap repair	10	100
Recurrence	0	0

The patient's age at the time of presentation ranged between 5 years to 22 years with an average age of 12.5 years.

All 10 patients underwent circumcision for refractory phimosis and for religious reasons.

The patients who were circumcised by a doctor had the dissection method of circumcision, patients who were circumcised by traditional circumcisers got circumcised by some local surgical method, which could not be described properly by the patients, however, none was circumcised using any form of circumcision device.

Four [40%] patients circumcisions were performed by a traditional circumciser and six (60 %) were circumcised by a doctor.

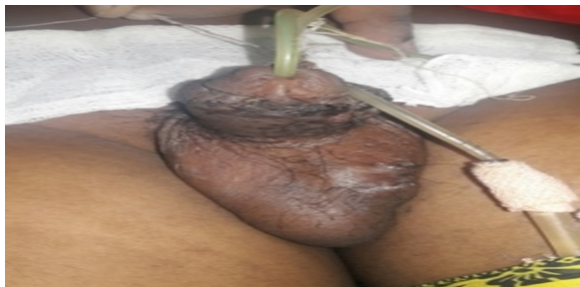


Fig-1: Pre-op picture.



Fig-2: Immediate post-op.



Fig-3: After 1 month.

All the cases had a single UCF, > 5 mm in size, and located in the coronal region [Figure 1]. In all cases, after degloving, the fistula was dissected all around, and using 5/0 polydioxanone sutures the closures were performed in three layers: Closure of fistula, tunica vaginalis flap layer closure, and finally skin closure. All of them were kept on per urethral catheterization for 10 days. Suprapubic diversion of urine was not done in any patient, following fistula closure. There was no recurrence of fistula in any case [Figure 2 and Figure 3].

Discussion

Circumcision, though one of the easiest and simplest operative procedures, is not without complications, and among its varied complications, one is a urethro-cutaneous fistula. After circumcisions, the reported complications rate is around 0- 30% [8]. Different reported complications include wound infection, sepsis, painful erection, concealed penis, incomplete circumcision [2]. However, one of the most troublesome is urethro-cutaneous fistula [9]. In India, mainly, Muslims practice male circumcision for cultural reasons [10]. No data is available in the literature regarding the complications of circumcision, age of circumcision, and the time of presentation in Indian children, however, the timing of circumcision and timing of presentation with complications in the present study was found to be

Similar to other reported studies [11]. In all our cases, in which circumcision was performed by traditional circumcisers, the procedure was performed without giving any anesthesia, which was reported by the mother; however, in the circumcisions done by the doctor, local anesthesia was used. Thus, urethral wall injury in an uncooperative patient with the wrong placement of sutures and quick clamping can be the cause of urethrocutaneous fistula in non-anesthetized cases. Other reasons described in the literature are taking a deep needle bite that engages urethra, the use of non-absorbable sutures, or carrying out the procedure in an unhygienic environment [11,12,13,14,15]. However, the most important factor as etiology of urethrocutaneous fistula remains lack of surgical skills especially if circumcision is being performed by poorly trained or untrained health personnel, as found in the present study and has been seen in other studies [15]. After making the diagnosis, the selection of an appropriate method for repairing the fistula is important. Regarding the timing of repair of a fistula, in case of urethral injury noticed during the operation, repairing at the same session provides very good results [16]. In the case of urethral injury noticed postoperatively, postponement of repair to at least 6 months gives better results, as the recommended time period helps in stopping and completely curing the inflammation [16]. In the present study time interval from injury to the presentation was more than 6 months for every patient as per the recommendation. Choosing the technique of repair depends on factors like location, size, number of fistulae, and soft tissue availability for reinforcement of the repair. Multilayered tension-free closure is usually the favored technique [17]. Ikuerowo et al [17] in his study repaired 31 cases of urethrocutaneous fistula following circumcision, in 9 patients he used simple closure technique, in 18 patients modified Mathieu repair [MMR] using dartos muscle flap and in 5 patients he used Snodgrass repair technique. He had fistula recurrence in 8 cases of MMR and 1 case of Snodgrass repair and all those cases had a fistula of >5 mm size, however, the present study had no recurrence using tunica vaginalis flap technique and in all our cases the size of the fistula was >5mm. In another study [18] using dartos pedicled flap repair was done for iatrogenic post circumcision fistula for 7 cases, with 1 recurrence in the postoperative period. So compared to other studies it is seen that tunica vaginalis flap can be used effectively for post circumcision urethrocutaneous fistulas of large size

With minimal recurrence. This flap is usually used after failed hypospadias surgery for repair of recurrent urethro-cutaneous fistulas and regardless of fistula location and number, type of initial hypospadias repair, and the number of previous closure attempts, this flap is highly effective [19] it is a simple procedure without any significant postoperative sequelae. In the present study had no recurrence, also there were no postoperative local complications. The present study encountered some limitations in this study like the small sample size of the study as post circumcision urethro-cutaneous fistula is not very common in our country, which might have resulted in zero postoperative recurrence rate.

Conclusion

Using Tunica vaginalis flap for repair of post circumcision urethro-cutaneous fistula is a highly effective technique regardless of size and site of the fistula. It is a simple procedure without any postoperative complications and without any recurrence as there were no postoperative complications or recurrence in the present study. It should be considered as an effective post circumcision urethrocutaneous fistula closure technique.

What does the study add to the existing study

This study has shown that tunica vaginalis flap is an excellent option for repair of post circumcision urethrocutaneous fistula without causing any harm to the testis and without any recurrence and can be considered as another surgical tool in the hands of urologists for treatment of post circumcision urethro-cutaneous fistula.

Contribution

Dr. Krishnendu Maity: Conception, design, and analysis **Dr Pinaki Roy:** Data collection, literature review, and writing **Dr D. K. Pal:** Supervision, critical review

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