

# Outcome of buccal mucosal patch graft in the Management of recurrent hypospadias urethrocutaneous fistula

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## Abstract:

**Background:** urethrocutaneous fistula after hypospadias surgery repair is the most common complication and remains a frustrating problem for surgeon and the patient. The problem is exacerbated because the urethrocutaneous fistula may recur which adds more demands surgery.

**Objectives:** The purpose of this study is to evaluate of the use of oral mucosal graft for management of recurrent urethrocutaneous fistula after hypospadias repair.

**Patients and Methods:** twelfth patients with age ranging from 4 year to 15 years were presented with history of recurrent fistula. Most of fistula were located in proximal penile and penoscrotal region (58.3%) . those patients were repaired by using oral mucosal graft with mean postoperative follow up period up to 6 months.

**Results:** analysis of results showed 10 out of 12 cases (83.3%) had a final successful outcome with no recurrent fistula during follow up period. The two patients with failed repair were candidate for another attempt for fistula repair later on. No donor site morbidity was observed in all patients.

**Conclusion:** Oral mucosal graft showed very good take and promising results when used for management of recurrent urethrocutaneous fistula after hypospadias repair.

**Key words:** urethrocutaneous fistula, hypospadias, mucosal graft.

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## Introduction:

Despite the advances in urethroplasty technique, certain complications remain problematic in the modern hypospadiologist namely, meatal stenosis, urethral stricture or diverticulum, wound dehiscence, and perhaps most important, urethrocutaneous fistula (1).

Urethrocutaneous fistula formation is the commonest complication of hypospadias repair, with a reported incidence of 4–25 % (2). The incidence is varying with severity of hypospadias, surgical technique, and experience of the operating surgeon (3).

Post hypospadias urethral fistula could be classified according to site, size, and tract part and according to number (4).

Several factors may lead to urethrocutaneous fistula including: distal obstruction, impaired vascular supply to neourethra, crossing suture line, poorly vascularized flap covering the neourethra, postoperative wound infection and urinary extravasations(5).

Once the urethrocutaneous fistula is established, the attention is directed to select the appropriate method to repair, depending on the location, size, number of fistulas, the distance between the multiple fistulas, and the availability of soft tissue for reinforcement of repair with second or multiple layers coverage (6-11).

Spontaneous closure of urethrocutaneous fistula has been

reported in up to 30 % of cases (5). Some authors have recommended a variety of measures to encourage this phenomenon. These include the use of adhesive tape to pull the fistulous edge together, and the use of topical silver nitrate in the early postoperative period should a fistula appear(12).

Most small fistula can be managed with simple excision and closure with additional layer of adjacent subcutaneous tissue and skin to help buttress the area (13).

Skin flaps are used for repairing fistula that is too large for simple closure, provided that the local skin is pliable and adequate (14).

For cases in which the local tissue is deficient or lacked an adequate blood supply, as seen in congenital defect or repeated scar tissue formation from previous surgeries, surgeons are compelled to use graft based procedure (15).

In this case we used buccal mucosa patch graft in the repair of recurrent hypospadias urethrocutaneous fistula.

## Patients and Methods:

A total number of 12 patients with history of recurrent urethrocutaneous fistula after hypospadias repair underwent buccal mucosa graft patch in plastic and reconstructive department in (Al – Shaheed Ghazi Al – Hariri) hospital during the period from 2011 to 2013.

The age group of patients ranged from 4 to 15 years. Their main complaint was single ventral penile fistula with dripping of urine seen during micturation, other complains from thin stream of urine from the fistula during micturation. All fistulae

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were measured in the anteroposterior length of the penis, their size were ranging between 4 – 20mm..

All patients were subjected to routine preoperative investigation. Ultrasound of genitourinary system was done to exclude any associated anomalies.

Repair of urethrocutaneous fistula was postponed at least 1 year after the last procedure to allow the scar tissue to take time to mature.

Cystourethroscope and urethrogram had been done in selected patients, for those with difficult calibration to exclude urethral stricture.

All patients were operated upon under general anesthesia. A traction suture is inserted into the glans slightly dorsal to the tip of penis, intraoperative urethral calibration is done with urethral sound to exclude any distal stenosis, methylene blue then was injected under pressure from terminal neourethra with tourniquet at the base of the penis to avoid missing other fistula. After that a N.G tube of suitable size was inserted into bladder. Xylocaine (2%) with adrenaline 1: 200.000 is then infiltrated around the surgical field to minimize the bleeding. The donor site is then prepared by applying stay sutures to the corner of the mouth to evert inner cheek. In some cases we harvested mucosa from lower lip, so that, the stay sutures are applied to lower lip to facilitate its eversion during harvest of the graft with either approach, a submucosal injection of small amount of xylocaine (2%) with adrenaline 1:200,000 to facilitate harvesting and aid hemostasis .

A circumferential incision is done around the fistula; the incision is carried down to the darots layer of penis. By using fine pointed scissor, fistula edges, were undermined and fistula tract was freely dissected from the surrounding tissue down to healthy thin urethral tissue.

A suitable size mucosa graft then is harvest either from inner cheek or from lower lip. The graft was taken according to size of defect. The donor site is closed by using 3-0 polyglactin interrupted suture. The graft is then defatted and tailored to defect size and suture to urethral epithelium using 6-0 polyglactin interrupted inverted sutures.

A subcutaneous dartos flap is dissected away from adjacent tissue and used as protective intermediate layer to cover the mucosal graft and sutured in place using 6-0 polyglactin suture.

After hemostasis is secured, the skin was closed with 4-0 polyglactin horizontal mattress suture.

Non – adherent antibiotic impregnated gauze is wrapped around the penis as first layer and then salined gauze soak is used as second layer. The dressing is changed in 1st postoperative day to inspect the repair site.

All patients were discharged from hospital in the second postoperative day keeping on injectable 3rd generation cephalosporin according to their body weight for at least 3

postoperative days.

After discharge, patient is kept on oral antibiotic till the day of removal of the indwelling catheter i.e. at 10-12 postoperative days.

Patients are kept on daily calibration, and follow up for 6 months, patients during the follow up period were observed for any sign of fistula recurrence or difficulty in micturition

**Results:**

The details of patient’s age, type of previous hypospadias repair, and number of previous fistula repair are shown in table -1- below.

**Table–1–patients details with failed hypospadias fistula repair.**

patients	age	Type of previous hypospadias repair	No. of previous fistula repair
1	4 years	Tubularized incised urethroplasty (TIP)	1
2	6 years	Tubularized incised urethroplasty (TIP)	1
3	4 years	Tubularized incised urethroplasty (TIP)	2
4	5 years	Tubularized incised urethroplasty (TIP)	1
5	7 years	Multistage repair with buccal mucosa	1
6	8 years	Multistage repair with buccal mucosa	2
7	4 years	Multistage repair with buccal mucosa	1
8	11 years	Multistage repair with skin graft	2
9	13 years	Multistage repair with skin graft	2
10	15 years	Multistage repair with skin graft	3
11	20 years	Multistage repair with skin graft	3
12	20years	Multistage repair with skin graft	3

Twelve patients (mean age 9 years) presented to us with history of recurrent urethrocutaneous fistula after hypospadias repair. Their details of previous hypospadias repair is shown in the table (2) below.

**Table-2- distribution of fistula according to its site**

Site of fistula	Number of cases
Coronal	1
midpenile	4
Proximal penis	3
penoscrotal	4

All patients had undergone previous urethra cutaneous fistula repair with 5 (41 %) undergoing 1 repair, 4 (33 %) undergoing 2 repairs, and 3 (25%) undergoing 3 repair. All repairs were by using local tissue.

Fistula repair using buccal mucosa graft in this study was successful in 10 out of 12 patients with no recurrence of fistula during the 6 months follow up period.

These two patients with failed fistula repair by using buccal mucosa graft developed fistula after catheter removal i.e. 14 day postoperatively. No postoperative complications had occurred in any of our patients including hematoma, wound infection wound dehiscence.

No donor site complications were noticed and all of our patients were able to eat within 24 hrs. Without complaint.

### **Discussion**

Fistula formation can be prevented by using fine suture material, utilizing a magnifying loupe, inversion of the urethral mucosa, avoidance of any overlapping suture lines, adding layers of soft tissue and sealing the repair with fibrin glue. These refinement and modification of the technique could reduce the previously high incidence of the fistula but does not completely prevent it (16-19). Why some fistulas recur is uncertain. Beyond any deficiencies of surgical technique or post operative management, there is no clear answer, other than impairment of local vascularity; scarred surrounding skin might be the plausible explanation (20). Successful fistula repair depends in large part upon meticulous attention to surgical detail, as well as the use of interposed tissue. In reoperative patient, however, this can be difficult to achieve (1), since previous surgeries lead to scarring and ischemic fibrotic tissue with poor healing and increase risk of fistula formation. If local tissue can not be used for hypospadias fistula repair because of extensive scar formation or compromised vascular supply, buccal mucosa graft can provide a reliable option (21). In this study 12 patients presented to us with a history of recurrent fistula following hypospadias repair. Maximum number of fistulas occur in the proximal penile and penoscrotal region (7 out of 12 patients), followed by mid penile and coronal region (5 out of 12 patients). All of our patients had undergone previous failed fistula repair by simple fistula closure. Most of the fistulae in this study (66.6%) were seen following multistage hypospadias repair either by buccal mucosa or skin graft tube, and all the fistulas in this study (whether primary or recurrent) were observed at the time of catheter removal, i.e. 10-14 day postoperative, and there is no obvious causes of fistulation for example stenosis, wound infection or wound dehiscence. Fistula repair by using oral mucosa graft in this study was successful in 10 out of 12 patients (83.3%) with no recurrence of fistula during the six months follow up period and this rate is compatible with Kiss et al (14) (85 % success rate in 7 patients) and with Barbagli et al (22) (82% success rate in 18 patients, and with Jalil Hossaini et al (78.6% success rate in 14 patients) (23). No postoperative complication was seen in our patient and no donor site morbidity. Regarding the

two patients that had failed fistula repair by mucosa graft, those patients had more than one time failed repair. The cause of this failure is probably because of these fistula are relatively large in size (20 mm). Those two patients were candidate for another attempt of fistula repair later on. Timing of repairing of fistula in our study was at least one year lapse from last repair this time is required for complete wound healing and allows for full resolution of scar tissue. The use of oral mucosa graft as donor tissue in urethroplastic reconstruction is an autologous transplantation of nonkeratinized oral mucosa to the urethra for use in the repair of a variety of urological defect (24). In 1991 Humby published the first report on using of oral mucosa for urethroplastic repair (25). In 1992 Burger et al reintroduced oral mucosa as tissue source for urethroplastic procedures and reported its use in a canine and small clinical population (26). Oral mucosa has been used with good result in complex urethral reconstruction and bulbar urethral stricture for more than 19 years; however few reports suggest that this tissue may be used for fistula closure (14, 27, 28). Oral mucosa exhibits superior graft take and decreased contracture, which is thought to be related to the unique anatomic aspect of oral mucosa. These features include a thick epithelium, a thin lamina propria with rich vascularity, less scar formation, rapid regenerative ability, and a natural inherent barrier to the threat of local sepsis (29). We believe it is essential that in suturing the mucosal patch, the mucosal edge should be inverted inside the fistula edge. It is also important to cover the repaired fistula with local dartos fascia to prevent any leaks. One of the draw back effect of harvesting of mucosa from inner cheek is the potential damage to buccinators neurovascular bundle and Stenson's duct. This was not encountered in our study since we harvested mucosa from lower lip sulcus which is away from Stenson's duct.

### **Conclusion:**

The treatment plan for a fistula must be individualized according to size, location and number of fistulas with attention to the local surrounding tissue. Oral mucosa graft is a simple procedure which can be used for treatment of recurrent hypospadias fistula with acceptable results.

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