

**INTERRUPTED VERSUS CONTINUOUS SUTURES IN ORAL MUCOSA GRAFT URETHROPLASTY FOR LONG ANTERIOR URETHRAL STRICTURES****Dr. Ankush Gupta**

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ABSTRACT Objective: To compare the effect of interrupted versus continuous suture technique in oral mucosa graft urethroplasty on complication rates in repair of long anterior urethral strictures. Patients and Methods: This was a prospective randomized study comprising 100 patients (age range 18–55 years) from January 2011 to December 2017 in a tertiary hospital. Patients having balanitis xerotica obliterans, urethral abscess and fistula, short stricture and other comorbidities were excluded. Patients showing submucosal fibrosis in oral mucosa or otherwise not suitable for grafting were also excluded. The patients were prospectively randomized into two groups: Group A, comprised of 50 patients with repair done using interrupted suture; and Group B, comprised of 50 patients with repair done using continuous suture. Outcomes were assessed in terms of complication rates and no need for further urethral instrumentation. Results: There was no significant difference in the occurrence of complications between the groups. There were 21 complications, with 10 occurring in Group A and 11 in Group-B. Recurrent stricture was the most common complication in both groups (six in Group A and seven in Group B). Erectile dysfunction occurred in one patient in each group. One patient from each group also had superficial wound infection, meatal stenosis and postvoid dribbling respectively, all of which were managed conservatively. The remaining patients of both groups had a satisfactory urinary stream. Conclusions: The suture technique makes little difference on the success or complication rates for oral mucosa graft urethroplasty and it is the surgeon's preference to utilize either of them.

KEYWORDS : Interrupted, Continuous, Stricture, Buccal Mucosa, Urethroplasty**INTRODUCTION**

Tissue transfer techniques are the only answer for urethral reconstruction not amenable to primary excision and anastomosis. For this purpose, tissues like inner preputial and distal penile circular fasciocutaneous flap by Quatery [1] and McAninch [2]; and buccal mucosa graft [3,10] have been successfully utilized. However, no one technique is suitable for the wide spectrum of urethral stricture disease.

Currently, substitution urethroplasty with oral mucosa graft remains the gold standard choice for long anterior urethral strictures [8]. It has a success rate that reaches at most up to 82.5% for long segment stricture. [4] There is no difference in the success rates whether the graft is placed dorsally, dorsolateral or as a dorsal inlay [5,11]. Hence, other factors affecting the outcome of urethroplasty may exist. Some of these possible factors include patient age, length of stricture, quality and width of urethral plate, type of suture, type of suturing technique, use of magnification during repair, use of catheter during repair, and use of antibiotics after repair [6]. However, the exact roles of these factors in predicting failure are not well defined in the literature.

We performed a prospective randomized study to evaluate and compare the effect of interrupted- vs continuous - suture oral mucosa graft urethroplasty (OMGU) on outcomes.

MATERIALS AND METHODS

This was a prospective randomized study comprising 100 patients (age range 18–55 years) with primary bulbar and/or penile urethral strictures who underwent repair from January 2011 to December 2017 in a tertiary hospital. Informed signed consent was obtained from the patients before the start of the study.

Inclusion Criteria

Only primary cases with primary bulbar and/or penile urethral strictures with stricture length more than 2 cms were included in the study.

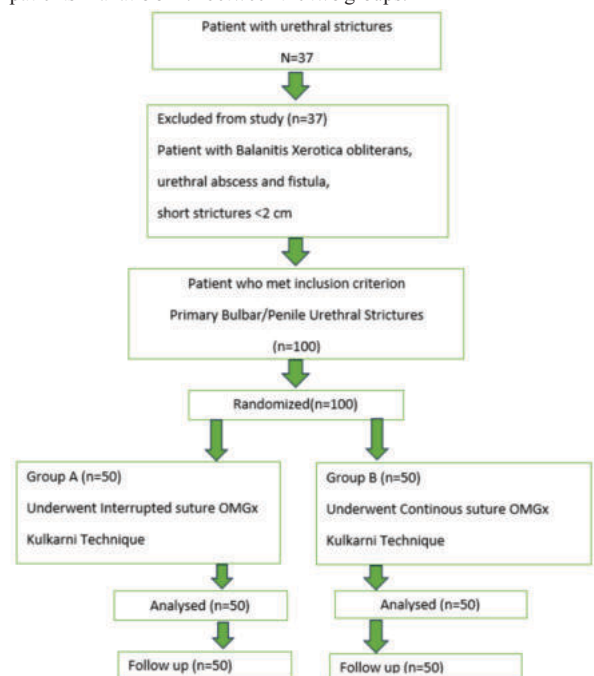
Exclusion Criteria

- Patients having balanitis xerotica obliterans, urethral abscess and fistula, short stricture (<2 cms) and other comorbidities were excluded. Patients showing submucosal fibrosis in oral mucosa or otherwise not suitable for grafting were also excluded. Urethras with a caliber <5 Fr were also excluded from the study.
- Preoperative evaluation for all patients included clinical history, physical examination, urine culture, uroflowmetry (UFM), retrograde urethrogram (RGU), voiding cystourethrogram (VCUG), and urethroscopy.

Randomization

All patients who met the inclusion criteria were prospectively

randomized into two parallel groups based on type of suture technique used for OMGU (Fig. 1). Randomization was done using sequential numbering of patients and then randomization with simple random sampling with the help of a computer random table to distribute patients in a ratio of 1:1 between the two groups.

**Figure – 1 Randomization****Study Procedure (Intervention)**

Group A, comprised 50 patients who underwent interrupted-suture OMGU; and Group B, comprised 50 patients who underwent continuous-suture OMGU. Prophylactic preoperative i.v. antibiotic (amoxicillin clavulanic acid) was administered routinely in all patients at the start of surgery. The surgery was performed under spinal anesthesia. In all patients, OMGU was done with 4–0 polyglactin 910 (Vicryl) suture. All patients were operated on by a single surgeon.

Oral mucosa urethroplasty was carried out as described by Kulkarni et al. [7]. Oral mucosa grafts were obtained either from the inner cheek, lower lip or both depending on the length of the stricture. The

procedure was carried out in lithotomy position. The OMG was harvested under local anesthesia using lidocaine (1%) with adrenaline. The urethra was dissected on its lateral edge only on one side, leaving the urethra attached to the underlying corpora cavernosa on the opposite edge. The urethra was opened a centimeter into the normal urethral mucosa both proximal and distal to the stricture. The graft was prepared by defatting, fenestrating, and sutured over the corpora cavernosa using 4-0 vicryl stitches in continuous / interrupted fashion over 16 Fr silicone catheter. In both groups; 16-F per urethral silicone catheter and supra pubic catheter were left in place for 3 weeks. All patients had postoperative antibiotic prophylaxis with amoxicillin + clavulanic acid for 7 days. an oral antibiotic was continued until removal of the catheter.

Follow-up and Outcome Assessment

Patients were examined at the time of catheter removal on 21st day. The supra pubic catheter was left in place for 5 days to ensure satisfactory voiding per urethrally. Subsequently the patients were followed three monthly for one year. Outcomes were assessed in terms of operative time, complication rates, lower urinary tract symptoms and no need for further urethral instrumentation.

Statistical Analysis

The outcomes were also verified statistically using the Statistical Package of Social Science. Fisher's exact test was used to compare categorical variables and ANOVA was used to compare continuous variables, with a $P < 0.05$ considered statistically significant.

RESULTS

100 patients meeting the inclusion criteria i.e. with primary bulbar and/or penile urethral strictures with stricture length more than 2 cms were selected for the study (Table 1) and were randomly divided into two groups each comprised 50 patients.

Table- 1 Incidence Of Different Type Of Strictures In Both Groups

Location	Group A (N=50)	Group B (N=50)	Total (N=100)
Bulbar	30	38	68
Penile	12	8	20
Bulbar and Penile	8	4	12

Operative Time

The mean operative time taken for the repair in Group A (139 mins) was more than that in Group B (132.4 mins), but this difference was statistically insignificant (ANOVA, $P > 0.10$). initially, the time taken for the repair in Group A was more compared to group B, whilst latterly the operative time for the interrupted suture urethroplasty was almost the same as for the continuous suture urethroplasty.

Complications

Complications occurred in 21 (21%) patients, 10 in group A and 11 in Group B, which was not statistically significant. Early post operative complications included wound infection (one in each group; $P > 0.7$) that improved on conservative management with no occurrence of wound dehiscence and epididymo-orchitis (one in each group; $P > 0.7$). Recurrent stricture was the most common complication occurring in 13 patients (six in group A and seven in group B). the site of the stricture was proximal anastomotic site in 9 patients (four in group A and five in group B), with no significant difference between the groups ($P > 0.6$). of the 9 patients 8 required an optical internal urethrotomy at 6 months and were relieved, whilst one patient required a re-do urethroplasty. Of the remaining four patients, there was recurrence of long segment stricture (> 3 cms) attributable to graft failure. These patients were put on a suprapubic cystostomy and planned for delayed repair. (Table 2)

Table 2 Incidence Of Complications In Both Groups

Complication	Group A (N=50)	Group B (N=50)/	Total (N=100)	P
Wound infection	1	1	2	0.753
Epididymo-orchitis	1	1	2	0.753
Recurrent Stricture	6	7	13	0.500
Proximal Anastomotic Stricture	4	5	9	0.657
Long Segment Stricture	2	2	4	0.657
Total	10	11	21	0.500

Lower Urinary Tract Symptoms

Of the 100 patients, the 77 without any postoperative complication had

a good single urinary stream (38 in group A and 39 in group B). the remaining two patients in group A without any post operative complication had post micturition dribbling of urine that improved with use of alpha blockers on follow up. There was urgency in two patients (group A) who had preoperative suprapubic cystostomy in situ for prolonged period (> 3 months).

DISCUSSION

The aim of stricture repair is to create a urethra of adequate calibre that allows for an adequate stream in standing position without the need for ancillary procedures like self-dilation, optical internal urethrotomy etc. In an attempt to achieve this elusive goal several procedures of urethral reconstruction have been elucidated in the literature with continuous evolution and refinement of techniques. Several types of urethroplasties have been described ranging from single stage procedures like free graft substitution, adjacent skin flap tubularization etc. to two stage procedures like Johanson staged urethroplasty. Amongst these substitution urethroplasty utilizing oral mucosa graft has shown promising results with widespread acceptance among reconstructive urethral surgeons.

However, the variations in surgical techniques and numerous other factors can influence the final outcome. The clear role of these influences is not yet defined. Whilst the use of synthetic absorbable sutures is the accepted norm, there is no consensus on the suturing technique (interrupted or continuous). This is mostly determined by individual choice of the operating surgeon. Whether a choice of suturing technique has a role to play is evident from the studies done on bowel anastomosis. It is well established that the use of interrupted suturing technique for bowel anastomosis has better outcomes and lower complication rates when compared with continuous suturing technique. However, the application of suturing technique has not been extensively probed for oral mucosa graft urethroplasty and hence there are no specific guidelines for the same.

In their study, Ulman et al (14) compared the use of 6-0 polyglactin in a single layer, full thickness, uninterrupted fashion to subcuticular suturing in uninterrupted fashion with 7-0 polydioxanone. They found that the use of subcuticular 7-0 continuous suture was associated with a lower incidence of complications. Similarly, Khan et al (15) also found that the use of inverting continuous suture was associated with lower incidence of urethrocutaneous fistula as compared to continuous suture urethroplasty in hypospadias repair.

In their study, El-Sherbiny et al (16) found that on univariate analysis suturing technique was a significant factor that could affect the outcome of urethroplasty in hypospadias repair. They found that on univariate analysis, the use of a running suture was significantly associated with a higher fistula rate (23%) as compared to an interrupted suturing technique. However, on multivariate analysis the suturing technique ceased to hold any independent significance. Our present study also supports the finding of these studies, as we found no significant difference between the recurrence rate of stricture amongst the interrupted (12%) and continuous (14%) suturing techniques. Similarly, there was no significant difference in overall outcome of the interrupted (20%) and continuous suturing (22%) techniques in oral mucosa graft urethroplasty. An advantage of our study was that it was a prospective randomized study. The limitation to our study is that surgeons were not blinded to the suturing techniques in both groups, which may result in outcome bias. Another limitation of our study is its small sample size in both groups, thereby reducing the power. A larger sample size in future studies is required to support these findings. The chance of confounding factors affecting the outcomes was minimized by matching most of the factors that could affect the outcomes in both the groups and focusing on the effect of suturing techniques.

CONCLUSION

From the current study outcomes, it appears that the type of suturing technique has no significant bearing on the occurrence of complications after oral mucosa graft urethroplasty. Therefore, the choice of suturing may be left to the surgeon's discretion till further evidence from studies or larger sample size and longer follow up are available.

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