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Acknowledgements
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ORIGINAL ARTICLE

Single Stage Buccal Graft Urethroplasty for Long Segment Anterior Urethral Strictures: Experience and Outcome From A Tertiary Hospital.

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Abstract

Background: Urethral stricture is one of the common urologic diseases constituting significant workload to urology practice worldwide. The prevalence is estimated to be 229–627 per 100,000 malesand its effects on the quality of life of those with the disease are enormous. Successful treatment of urethral stricture has been a challenge to urologists particularly long segment and complex strictures. This led to several procedures to evolve over past several decades. Substitution urethroplasty has become the gold standard procedure for the treatment of long segment anterior urethral strictures. **Objective:** To document the experience and outcome of use of single stage buccal graft urethroplasty for treatment of long segment anterior urethral stricture in a tertiary hospital. **Patients and Method :** It was a retrospective descriptive study of all patients who were treated for long segment anterior urethral stricture by single stage buccal graft substitution urethroplasty in our hospital from 2016 to 2021(5years). Medical records of patients were retrieved and their information about bio-data, presentation, risk factors for urethral stricture, investigations done. The type of buccal graft harvest and onlay and outcome including complications were extracted and entered into the already designed proforma. The generated data was entered into excel sheets and analyzed using special package for social sciences (SPSS) and results presented in tables and figures. **Results:** A total of 45 patients were treated for long segment anterior urethral stricture by single stage buccal graft substitution urethroplasty between 2016 and 2021(5years) of which the records of 42 patients were retrieved and data was collected and analyzed. All were males within the age range of 35 to 78 years and a mean age of 57.2years ±7.4SD. The risk factors for urethral stricture were past history of purulent urethritis (59.5%), prolong catheterization (21.5%), urethral trauma (9.5%), past urethral surgery (9.5%). The site of the urethral stricture was found as follows; Penile urethra (61.9%), Penobulbar (26.2%), Bulbar urethra (7.1%) and Panurethra (4.8%). Intra operative length of the stricture was found as follows: <5cm (21.4%), 5-10cm (23.8%), 10 -15cm (50%) and >15cm (4.8%). The buccal graft onnlay procedures used were dorsolateral onlay (73.8%), dorsal onlay (14.3%), ventral onlay (11.9%). Following urethroplasty catheter was removed as follows: <4weeks (42.9%), 4-6weeks (38.1%) and >6weeks (19%). Complications recorded were: Surgical site infection (21.4%), urethral diverticulum (4.8%), urethrocutaneous fistula (2.4%) and recurrence (4.8%). Majority of the patients (66.7%) had no complication. **Conclusion:** Single stage buccal graft substitution urethroplasty for long segment anterior urethral stricture has overall good success rate with minimal complications.

Keywords : Single stage, Buccal graft, Long segment urethral stricture

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Introduction

Urethral stricture is one of the common urologic diseases constituting significant workload to urology practice worldwide. The prevalence is estimated to be 229–627 per 100,000 males and its effects on the

quality of life of those with the disease are enormous[1]. In Sub-Saharan Africa, the incidence is probably higher, due to the higher prevalence of poorly treated urethritis in addition to other aetiologies[2]. Early reports almost completely attributed urethral stricture to gonococcal urethritis. However, several other causes have been identified and they include trauma, iatrogenic, post hypospadias repair, lichen sclerosis, post prostatectomy, radiotherapy, and catheter induced. Whereas trauma and iatrogenic causes are commonest in developed countries, inflammatory causes have now become infrequent[1], while in developing countries the inflammatory causes are still frequent[2]. The management of the disease has evolved all over the world though not uniformly. A good history and physical examination contribute immensely to the diagnostic process. Retrograde urethrography (RUG) remains the gold standard investigation, while urethrosonography, computerized tomography (CT), and magnetic resonant imaging (MRI) are presently seen as adjunct to RUG[3]. Successful treatment of urethral stricture has been a challenge to urologists particularly long segment and complex strictures. This led to several procedures and their evolution over several decades. Open surgical repair using grafts or flaps, called substitution urethroplasty, has become the gold standard procedure for anterior urethral strictures that are not amenable to excision and primary anastomosis (long segement and complex strictures)[4]. Oral mucosa harvested from the inner cheek (buccal mucosa) is an ideal material, and is most commonly used for substitution urethroplasty, the use of buccal mucosa was first described in 1941[4,6] and reintroduced in 1992[4,6]. It possesses the advantages of constant availability, easy harvesting, favorable immunological properties (resistance to infection) and good tissue characteristics (a thick epithelium, high content of elastic fibers, thin lamina and rich vascularization).Onlay augmentation on the ventral side (ventral onlay) or dorsal side (dorsal onlay, Barbagli procedure) has been widely used for bulbar urethral stricture with comparable success rates. Most penile urethral strictures can be repaired in a one-stage procedure either by dorsal inlay with ventral sagittal urethrotomy (Asopa technique) or dorsolateral onlay with one-sided urethral dissection (Kulkarni technique); however, staged urethroplasty remains the procedure of choice for complex strictures, including strictures associated with genital lichen sclerosus or failed hypospadias [1,4]. We undertook a retrospective study to document the experience and outcome of single stage buccal graft urethroplasty for patients managed for long segment anterior urethral stricture in a tertiary hospital.

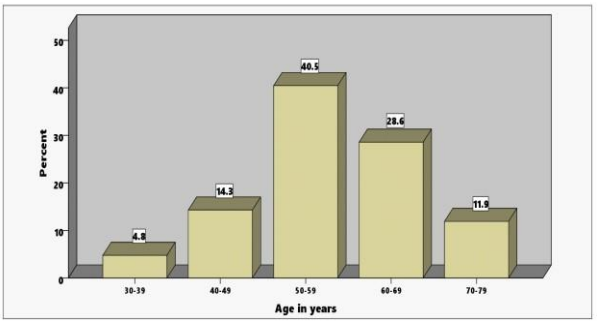
Patients and Method

It was a retrospective descriptive study of all patients who were treated for long segment urethral stricture by single stage buccal graft substitution urethroplasty in our hospital from 2016 to 2021(5years). Ethical approval was obtained from the research and ethics committee of the hospital for the conduct of the study. Particulars of the patients who had the procedures over the period covered by the study were retrieved from the theatre register and their medical records were collected with the help of the record staffs of the hospital. Information about the patients' bio-data, presentation, risk factors for urethral stricture, investigations done, the type of buccal graft harvest and onlay and outcome including complications were extracted and entered into the already designed proforma. The generated data was entered into excel sheets and analyzed using special package for social sciences (SPSS) and results presented in tables and figures.

Results

A total of 45 patients were treated for long segment anterior urethral stricture by single stage buccal graft substitution urethroplasty between 2016 and 2021(5years) of which the records of 42 patients were retrieved and data was collected and analyzed.All were males within the age range of 35 to 78 years and a mean age of 57.2years ±7.4SD, the age distribution is shown in Fig 1.

Figure 1: Age distribution of the patients



Past history of purulent urethritis is the most common risk factor for urethral stricture among our patients as shown in Figure 2

The site of the urethral stricture was found as follows;

Penile urethra (61.9%), Penobulbar (26.2%), Bulbar urethra (7.1%) and Panurethra (4.8%). Intra operative length of the stricture estimated to ascertained the length of the graft to be used was found as follows: <5cm (21.4%), 5-10cm (23.8%), 10 -15cm (50%) and >15cm (4.8%). Different buccal graft onlay procedures were used depending on the site of the stricture as shown in Table 1.

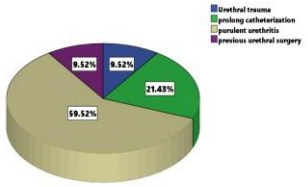


Figure 2: Risk Factors for Urethral Stricture

Table 1: Buccal Graft Onlay Procedures

Buccal graft onlay procedure	Frequency	Percent
Dorsal onlay	6	14.3
Dorsolateral onlay	31	73.8
Ventral onlay	5	11.9
Total	42	100.0

Figure 3: Harvesting Buccal Graft

Figure 4: Urethra lay open with the graft

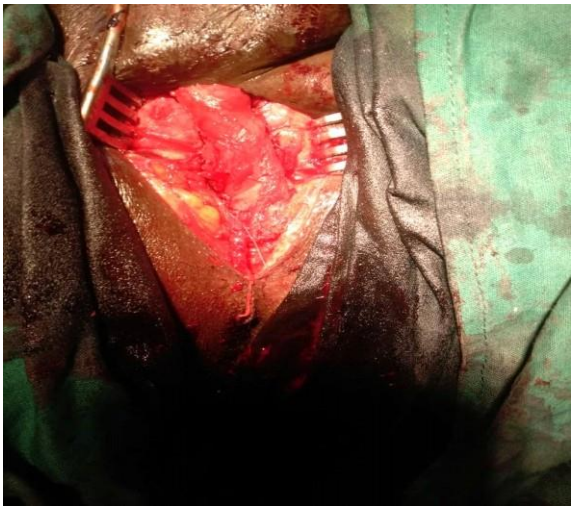


Figure 5: Urethra after Reconstruction

Table 2: Complications of Single Stage Buccal Graft Urethroplasty

Complications	Frequency	Percent
Surgical site infection	9	21.4
Urethral diverticulum	2	4.8
Urethro-cutaneous fistula	1	2.4
Recurrence	2	4.8
None	28	66.7
Total	42	100.0

Figure 3, 4, and 5 below shows an intraoperative buccal graft harvesting, urethral layered open with the graft and urethral after reconstruction respectively.The duration of urethral catheter was based on satisfactory healing with no evidence of contrast leakage on peri-catheter RUG as follows: <4weeks (42.9%), 4-6weeks (38.1%) and >6weeks (19%). Few complications were recorded among our patients who were followed up for a period between 6-12months post surgery. Majority had good outcome as shown in Table 2.

Discussion

The mean age of our patients is 57.2years ±7.4SD which is similar to finding from a study with larger sample size from the same region[7]. The risk factors for urethral stricture in our patients are largely previous urethritis and previous catheterization. These risk factors are known to predispose patients to have long segment urethral stricture which all the patients had. This further explains why most of the strictures were found at the penile and peno-bulbar region of the urethra[2,3]. The findings are similar to those from other studies[8,9].

The length of the stricture in more than half of our patients was greater than 10cm; this differs from findings in other studies done in Asia[10,11] which found most stricture length between 5-8cm. This could be explained by the different aetiologies of the stricture. Dorsolateral buccal graft onlay was used in majority of patients owing to site of most of the strictures and being simple to perform with good results in previous studies[11]. The catheter was removed in less than 6weeks for most patients, however it was prolonged in few patients due to delayed healing as evidenced by contrast leakage on peri-catether RUG. Successful urethroplasty evidenced by non recurrence of the stricture after 6 -12months was achieved in more than 80% of the patients; this is also similar to findings from other studies[12-15].

Conclusion

The use of single stage buccal graft substitution urethroplasty for long segment anterior urethral stricture has overall good success rate with minimal complications.

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