USE OF PENILE SKIN FLAP IN COMPLEX ANTERIOR URETHRAL STRICTURE REPAIR: OUR EXPERIENCE

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ABSTRACT

Objective: To present our experience of treatment of complex anterior urethral strictures using penile skin flap.
Study Design: Descriptive, case series.
Place and Duration of Study: Department of urology Combined Military Hospital Malir Cantonment, Karachi and Armed Forces Institute of Urology, Rawalpindi from Jan 2012 to Feb 2014.
Material and Methods: Total 18 patients with complex anterior urethral strictures and combined anterior and bulborurethral strictures were included. Patients underwent repair using Orandi or circularfacio-cutaneous penile skin flap depending upon the size and site of stricture. First dressing was changed after two days and an in dwelling silicone two way foleycatheter was kept in place for three weeks. Graft was assessed with regards to local infection, fistula formation and restricturing. Re-stricture was assessed by performing uroflowmetery at 6 months and 1 year. Ascending urethrogram was reserved for cases with less than 10 ml/sec Q max on uroflowmetery. Repair failure was considered whenthere was a need for any subsequent urethral procedure asurethral dilatation, dorsal visual internal urethrotomy, or urethroplasty.
Results: Overall success rate was 83.3%. Of all the patients operated 1(5.6%) had infection with loss of flap, 3(16.7%) had urethral fistula and none had re stricture confirmed by uroflowmetery.
Conclusion: In our study the excellent results of the penile skin flap both in anterior urethral strictures and combined anterior and bulbar urethral strictures are quite encouraging. It is easy to harvest and seems anatomically more logical.

Keywords: Anterior urethral stricture, Bulbar urethral stricture, Penile skin flap.

INTRODUCTION

Urethral stricture refers to anterior urethraldisease, or a scarring process involving the spongy erectiletissue of the corpus spongiosum[1]. Strictures of the anterior urethra account for 92% of cases of urethral stricture. The most common location involved within the anterior urethra are bulbar urethra (46.9%) followed by penile (30.5%) and combined bulbar and penile urethra (9.9%)[2]. The most common causes of penile strictures areiatrogenic injuries and inflammatory conditions. Whereas in case of bulbar strictures an idiopathic etiology is most commonly observed, followed by iatrogenic and inflammatory causes[2]. Urethral trauma accounts for 5% of all penile strictures and 15% of bulbar strictures in the industrialized world. However in developing countries trauma accounts for much higher percentage of urethral strictures[3].

A multitude of methods have evolved aiming to cure these patients but none has proven to be suitable for all types of strictures[4]. In the recent years advances in understanding the etiology, pathogenesis and diagnosis have resulted in evolvement of various modes of treatment of anterior urethral strictures. Though the treatment of long (more than 2 centimeters) and complex anterior urethral stricture (including those resulting from failed hypospadias repair and prior urethroplasty) is still controversial but the use of free grafts and flaps is indespensible[5]. Penile skin flaps, which have ample vascular pedicle, and are considered the most reliable

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Received: 03 Mar 2015; revised received: 27 Mar 2015; accepted: 30 Mar 2015

material for reconstruction of long or complex stricture[6,7].

We are presenting our experience of penile skin flaps in long complex urethral stricture. We found that penile skin flaps offer not only good functional and cosmetic results but it also seems anatomically more logical. It is a simple one stage procedure. This is the first kind of such study in our setup.

MATERIAL AND METHODS

Study design was descriptive statistical in nature. The study was carried out at Combined Military Hospital, Malir cantonment, Karachi and the Armed Forces Institute of Urology, Rawalpindi from January 2012 till February 2014. Sampling was done on convenience basis and a total of 18 patients with complex anterior urethral strictures and combined anterior and bulbourethral strictures were included. Patients with short strictures (less than 2 cm) where end to end anastomosis or short segment augmentation with graft could be done were excluded from this study. All the patient's underwent routine laboratory investigations (e.g. complete blood count, serum urea and creatinine, urine microscopy), upper tract evaluation by ultrasonography (US), uroflowmetery and retrograde urethrography. All strictures were operated under general / regional anesthesia with patient in lithotomy position. After incision urethra was completely mobilized from underneath corpus cavernosa and rotated to 180 degrees. After dorsal stricturotomy penile skin flap was applied as a dorsal onlay flap, in cases where defect was long , circular penile skin flap was utilized as well fig 1& 2. In most cases the repair was covered with an additional tunica vaginalis flap. Close suction drains were placed and indwelling silicon cather was left for 21 days. First dressing was changed after 2 days. Suction drains were removed once the drainage was less than 10 ml / 24 hours. Patient was advised to start sitz bath from fifth post OP day. Uroflowmetery was performed after catheter removal and at 6 and 12 months. At follow up patients were assessed for any infection, haematoma formation, urethral fistula and restricturing. Loss of flap due to infection, haematoma and fistula or re-stricturing requiring any secondary procedure were termed as failure. Data analysis description were done on SPSS-16.

RESULTS

Study included 18 patients, ranging in age from 18 year to 56 years. Mean age was 29.28 years (SD=1.85504). The site of stricture was anterior urethra in 8 (44.44%) cases while 10 (55.6%) patients had combined anterior urethral and bulbar urethral strictures. Stricture length ranged from 3 centimeters to 10 centimeters with mean being 5.6 centimeters. Orandi flap was utilized in 8 patients while circular penile facio cutaneous flap was utilized in 10 patients. Complications seen are depicted by table. Of the three patients with urethral fistula one healed with conservative management while 2 (11.1%) required second procedure. Overall failure rate was 16.7% (n=3) while the cure rate was 83.3%. One flap was lost due to infection and the patient was diabetic. No re stricturing was observed in our study on post op follow up. Mean Q max was 22.5 ml per second.

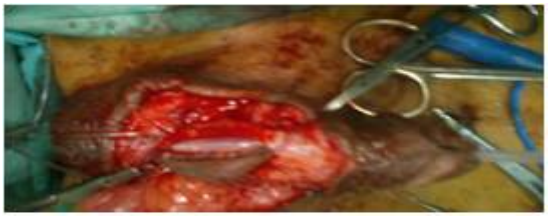

Figure-1: Penile skin flap applied over the stricturotomy.

Figure-2: Tunica vaginalis flap to cover the repair.

DISCUSSION

Treatment of urethral strictures dates back to ancient Egyptians. Use of wooden bougies has been in practice as early as 600 BC8. Over the last fifty years the management of urethral strictures especially long complex anterior strictures have seen a drastic change owing to use of grafts and flaps. From the use of full thickness skin grafts to penile skin flaps various tissues have been used for the purpose. These include buccal graft, penile skin flaps, preputial skin flaps, bladder and bowel mucosa[6-12].

strictures in the penile urethra or a compromised graft bed a distal penile skin flap was found to be the most reliable approach. Orandi presented a one stage urthero-plasty technique using penile skin flap in 1968 and published his results in 1972. McAninchin 1993 described the use of circular fascio-cutaneous penile flap in extensive anterior urethral strictures. The surgical technique described by McAninch still represents the most important and advanced evolution of Orandi's flap[16].

In our study the success rate was observed

Table: Frequency of complications of treated cases of complex anterior urgtheral stricture.

		Frequency (n=18)	Valid percentage	Cumulative percentage
Valid	Infection	1	5.6	5.6 11.1
	Urethral Fistula	3	16.7	22.2 44.4
	None	14	77.8	100.0
	Total	18	100.0	

Use of single stage tabularized flaps has been reported with high recurrence rates (50%) in earlier studies but this was owing to small sample size[13]. Owing to this they were abandoned in the past and two stage procedure (Johansan technique) was popularized. The technique involved a first stage of grafting followed by formation of neo urethra after 6 months, though this technique was initially appreciated for its good results but it had its problems. One being that a wait of six months was undesirable to many patients[13]. Also a number of cases actually needed more operations than the name warranted[14]. Hence need for a simple, reliable, single stage procedure with flap/ graft having adequate vascularity but also having physical characteristics compatible with recipient site[15]. In a review of literature by Wessells on free graft and pedicle skin flap urethroplasty to determine the optimal method of repair, free grafts were found to be successful in 84.3% of cases and flaps in 85.9%. Buccal mucosa grafts were the most successful method for reconstruction of bulbar urethral strictures. For

to be 83.3% which is comparable to that found in literature Wessells and McAninch reported a success rate of 85.9%, while Kim et al reported a rate of 68.9%[16], McAninch, Morey[7], Kader et al[17] and Zaki and Dahshoury[18] reported an incidence of 68.9% , 79% and 85.8% respectively.

Fistula formation was found in 3 (16.7%) of cases while the reported incidence in literature is 3% to 5.5%[15-18]. Infection was seen in 1(5.6%) case in our study while Zaki and Dahshoury reported 2 out of 30 cases with infection and patchy skin loss was observed in 3 (15%) cases by Khan et al[15].

There aresome limitations toour study. One being that it is a retrospective study with only 18 patients. The median follow up time in our study was 10 months. To have better results a larger series with a long follow up is necessary.

CONCLUSION

In our study the excellent results of the penile skin flap both in anterior urethral strictures and combined anterior and bulbar

urethral strictures are quite encouraging. It is easy to harvest and seems anatomically more logical.

CONFLICT OF INTEREST

This study has no conflict of interest to declare by any author.

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