

Original Article

Experience With Ventral Penile Skin Island Flap urethroplasty

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Abstract

Background: Island flap techniques currently used in urethroplasty utilize the prepuce and the dorsal penile skin. Our experience with a one-stage island flap urethroplasty for urethral strictures utilizing the ventral penile skin is described.

Patients and Method: This is a longitudinal study of seventy six consecutive patients with impassable and complicated urethral strictures treated using this technique over a seven-year period. Sixty were bulbous while sixteen were bulbomembranous urethral strictures. Following operation the patients were assessed using urine flow rates, urethrograms and some urethroscopy. Restrictures were successfully reoperated.

Results: Sixty-eight patients (89.5%) had satisfactory voiding with good urine stream without complication at one year after operation. Five patients (6.6%) had restructure and three (3.9%) others had urethral bagginess and postmicturition dribbling. The overall complication rate was 10.5%. At three years after initial operation and reoperation seventy-five patients (98.7%) were voiding satisfactorily. There was one complete failure, no death.

Conclusion: This technique has produced satisfactory results compared with other similar techniques in current use. Further work is required to make valid conclusions about the value of this procedure.

Key words: Urethral stricture, Ventral penile skin, , Urethroplasty.

Introduction

Penile and preputial skin have been used for one-stage urethral reconstruction with excellent functional and cosmetic results in the past three decades^{1,2,3}. Urethroplasty is generally reserved for those patients who have failed to respond adequately to simple instrumentation – those with complicated and complex strictures and those with dense impassable strictures^{2,4}. Intraluminal coil stenting of strictures may offer temporary benefit in some strictures that fail to respond to instrumentation^{5,6}. Urethroplasty, therefore, still remains the last hope of the urethral cripple. Penile and preputial island skin flap techniques described so far utilize the dorsal penile skin and prepuce. The dorsally based flap is rotated ventrally to reach the site of urethral defect. We describe here a one-stage island flap technique utilizing the ventral penile skin flap and a ventrally based pedicle for the repair of urethral strictures. This is a longitudinal study of our first consecutive 76 patients operated with this modification.

Patients and Method

Between Jan. 1996 and Dec. 2002 seventy-six patients were treated using this technique in the Urology unit of U.D.U.T.H., Sokoto. They were aged between 7 and 56 years. The mean age was 41 years. The causes of the urethral strictures included infection (44.7%), trauma (47.4%) and instrumentation (7.9%). The causes are summarized on Table 1. All the patients were referred to the unit for failed repeated

instrumentation, and for, impassable and complicated urethral strictures. Table II is a list of other some clinical features associated with the e strictures. All patients had suprapubic catheters before repair. The operative technique is essentially similar to that used for dorsal transverse penile island skin flap urethroplasty described by Duckett and Quartey^{1,2,9}. In this case, however, the incision, flap and pedicle are ventral. In the mid line of the ventral transverse flap pedicle is the frenula artery. The stricture is exposed in the same manner and then the flap is designed to fit. The flap is transferred to the site of stricture through the extended flap incision as appropriate. The sites of the strictures are summarized on Table III. The length of the grafts used ranged from 3.5 to 7.5cm and the width from 2.5cm to 3.5cm. There were 31 ventral oblique flaps and 27 ventral transverse flaps; 18 were ventrolateral flaps. The lengths of flaps are summarized on Table IV. In 62 patients the ventral penile skin flap was utilized as a patch; in 14 patients the patch was partially tubulised to bridge the defect. To facilitate skin closure in some patients the sub-coronal skin incision is extended around the penis and the skin mobilized to create Byar's flaps⁽⁴⁾ to effect skin closure. Post-operatively the patients were seen at 2 weeks, 8 weeks and thereafter every 3 months. Those patients with diminishing urine stream had repeated assessments

for.re-do surgery.

Results

Sixty-eight patients (89.5%) had satisfactory result at one year follow up with acceptable cosmetic appearance, good urine stream and no complication. There was restricture in five patients (6.6%) and bagginess and postmicturition dribbling in three (3.9%) patients. There was erectal dysfunction in one patient, that lasted about 3 months. The results of operation are summarized on Table V. The total complication rate was 10.5%. After the complications have been dealt with, seventy-five (98.7%) patients were voiding satisfactorily. Five (6.0%) patients required repeated urethral dilatation in the first year and one of these patients who presented with hypertension and chronic renal failure later required a permanent vesicostomy. He has developed renal failure and is currently on haemodialysis. There were no complications causing urethrocutaneous fistulae and chordee .

Table I: Causes of Urethral Stricture

Cause	No. of Patients	%
Trauma	36	47.4
Infection	34	44.7
Instrumentation	6	7.9
Total	76	100

Table II: Associations of Urethral Strictures

Feature	No. of Patients	%
Failed Dilatation	76	100
Complex Impassable Strictures	64	84.2
Urethrocutaneous fistula	22	28.9
False passage/Diverticulum	20	26.3
Urethral/Calculus	16	21.1
Prior Repair impassable structure/simple	16	21.1
Multiple strictures	48	63.2
	28	36.8

Table III Location of Urethral Strictures

Urethral Site	No of Patients	%
Bulbo-penile	18	23.7
Bulbous urethra	42	55.3
Bulbo membranous	16	21.0
Total	76	100

Table IV Length of Ventral Penile Skin Flaps

Types of Flap	No. of Patient (%)	Graft size (cm)
Ventral	2 (35.5)	5.0 – 6.5
Transverse		
Ventral oblique	31 (40.8)	5.5 – 7.5
	7	
Ventrolateral	18 (23.7)	3.5 – 5.5
Total	76 (100)	3.5 – 7.5

Table V Outcome of 76 Ventral Penile Flap Urethroplasties

Results	No.	%
At 1 year		
No. of Patients	76	
Satisfactory	68	89.5
Restricture	5	6.5
Postmicturition dribbling	2	2.6
Urethral diverticulum	1	1.3
Fistula	0	0
Total	8	10.5
At 3 years		
Satisfactory	75	98.7
Restricture	1	1.7

Discussion

The unique mobility of the penile skin and the pattern of its blood supply permits a well-vascularized flap to be mobilized from any part of the penile skin to reach

the posterior urethra. The preservation of the vascular pedicle increases the chances of survival of the skin graft. In this technique, the island skin graft is mobilized from the ventral aspect of the penis and the vascular pedicle is fashioned in a manner similar to dorsal skin flaps described by Duckett⁽⁹⁾ and Quartey⁽¹⁾. The axial flap is taken to the site of repair directly through a short straight subcutaneous tunnel or an extended ventral skin incisions. There is no rotation of the pedicle as in the dorsal skin flap procedures. The technique can be utilized for anterior and posterior urethral strictures. It cannot be utilized in the repair of hypospadias for obvious reasons. For distal urethral strictures the dorsal and ventrolateral penile skin flaps are more appropriate. As a result of the developments in the field of urethroplasty in the last three decades repair techniques are expected to ensure the restoration of efficient voiding and freedom from follow-up instrumentation to almost every patient. Any stricture should cause the surgeon to reflect on the choice of the procedure and the technique of its performance^(4,7,10). In this report, efficient voiding was restored in sixty-eight patients (89.6%). Five patients (6.5%) required follow-up instrumentation. There was stricture in one of these patients. Our long-term failure rate was 1.3%. Definite substitution procedures are now expected to

achieve a long-term failure rate of less than 10%⁷. In this preliminary report of our experience, our results appear very good and quite comparable to results from other existing techniques of penile skin flap urethroplasty. Our patients included ischaemic strictures and patients for "retrievoplasty". Most of our patients had complicated or impassable strictures. Our complication rate at one year of 10.5% is quite low compared with other available reports^{4,7,10}. Using this technique, we were able to shorten our urethroplasty time on the average by about 30 minutes. This may be attributed not only to a simpler technique but also to the increasing experience over the years. This technique seems to hold promise to become a useful modification in urethral reconstruction. It will require a larger series to establish its relevance in current urethroplasty. Urethroplasty still offers the opportunity for restoration of efficient voiding to patients with complicated and impassable urethral strictures.

Conclusion

We have reported the ventral penile skin island flap procedure. The results seem to be good and long term failure rate appears to be low. Further work is required in order to make valid conclusions with regard to its value compared to other techniques of urethroplasty

References

1. Quartey JKM: One-stage Penile/Preputial Cutaneous island flap urethroplasty for urethral stricture: A preliminary report. *J. Urol.* 1985; 134: 474 – 475.
2. Osegbe D N and Ntia I O: One – stage Urethroplasty for complicated Urethral Strictures using axial penile skin island flap: *Eur. Urol.* 1990; 17 : 79 – 84.
3. Parsons KF and Abercrombie GF: Transverse Preputial Island Flap Neo-urethroplasty. *Br. J. Urol.* 1982; 54:745 – 747.
4. Mundy AR. Results and Complications of Urethroplasty and its future. *Br. J. Urol.* 1993; 71: 322 – 325.
5. Milroy EJG, Chapple CR, Eldin A et al: A new stent for the treatment of Urethral Strictures. *Br. J. Urol.* 1989; 63: 392 – 396.
6. Yachia D and Beyar M: New Self expanding, Self-retaining temporary Coil Stent for recurrent Urethral Strictures near the external sphincter. *Br. J. Urol.* 1993; 71: 317 – 321.
7. Turner Warwick RT: The management of Traumatic Urethral Strictures and injuries. *Br. J. Surg.* 1973; 60: 775.
8. Waterhouse K, Abrams J, Graber H et al: Transpubic approach to the lower urinary tract. *J. Urol.* 1973; 109: 486.
9. Duckett JW, The island flap technique for hypospadias repair: *Urol. Clin. North Am.*, 1981; 8:503 – 512.
10. Osegbe DN and Arogundade RA: Changing Pattern of Urethral Stricture in Nigeira. *Nig Postgraduate Med. Journal.* 1994; 1:1 – 5.
11. Byars L.T. Surgical Repair of hypospadias: *Surg. Clin. North Am.* 1950; 30:1371.

