

ROLE OF DOUBLE BREAST VASCULARIZED PREPUTIAL DARTOS FLAP REINFORCEMENT IN SNODGRASS URETHROPLASTY

Islam ADMS¹, Aziz MA²

Abstract

Introduction: The Snodgrass technique is the procedure of choice for mid and distal penile hypospadias. Urethrocutaneous fistula is the most common complication and vascularized flaps are used to reduce fistula rate.

Objective: The objective of this study was to evaluate the effect of use of double breast vascularized preputial Dartos flap in Snodgrass urethroplasty.

Materials and Methods: This prospective study was conducted on thirty patients of mid and distal penile hypospadias, who were operated at Dhaka Shishu Hospital Dhaka between the period January 2010 and July 2010. Snodgrass Urethroplasty was done in 15 patients (group-A) and Snodgrass urethroplasty with additional double breast vascularized preputial dartos flap reinforcement was done in another 15 patients (group-B). The Dartos flap was fashioned into two halves longitudinally. One half placed transversely and another longitudinally over the neourethra in a double breast manner. The patients were followed up at 2 weeks, 2 months and 6 months after operation.

Results: The mean age of the patients was 4.38 ± 3.31 years in group-A, 5.34 ± 3.04 years in group-B. The mean operation time was 75 ± 11.47 minutes in group-A and 101 ± 13.84 minutes in group-B. In group-A, urethrocutaneous fistula was found in 6 (40%) patients and in one (6.7%) patient of group-B, which was significantly less ($p < 0.05$). One (6.7%) patient developed mild penile torsion

postoperatively in group-B. At 2 months after operation, 11 (73.3%) patients in group-A and 13 (86.7%) patients in group-B gained adequate urethral caliber.

Conclusion: The technique is safe and significantly reduces the incidence of urethrocutaneous fistula.

Keywords: Vascularized flap, Snodgrass procedure, urethrocutaneous fistula

Introduction

The Snodgrass technique is the procedure of choice for mid and distal penile hypospadias, as it is versatile, easy to do and has a good cosmetic outcome, with a vertically oriented meatus as in a normal circumcised penis¹. Urethrocutaneous fistula is the most common complication, and modifications of modification continue to reduce the fistula rate². The Dartos flap is composed of vascularized subcutaneous tissue that is dissected from the dorsal preputial and shaft skin. Vascularized flaps were used over the neourethra by different Surgeons³⁻⁵. All these procedures reduced the rate of fistula. In the present study, the role of Double breast vascularized Dartos flap in Snodgrass urethroplasty was evaluated to reduce the urethrocutaneous fistula without compromising cosmetic outcome.

Materials and Methods

In this prospective study thirty patients with mid and distal penile hypospadias were operated at Dhaka Shishu Hospital of Sher-e-Bangla nagar, Dhaka between the period January 2010 and July 2010. Patients were divided into two groups. In group-A, 15 patients underwent Snodgrass

1. Lt Col A D M Shariful Islam MBBS, FCPS CMH, Dhaka Cantt; 2. Dr M Abdul Aziz, Department of Pediatric surgery, Dhaka Shishu (Children's) Hospital, Bangladesh

urethroplasty and in group-B, another 15 patients underwent Snodgrass urethroplasty with double breast vascularized Dartos flap reinforcement.

In this modified technique after creating neourethra via Snodgrass urethroplasty the de-epithelialized preputial flap was prepared as a transverse island flap. Trans-illumination was used to pinpoint the vascular supply⁶. A longitudinal incision was made along the vascularized flap to create two halves. Those halves were de-epithelialized, the cutis was removed and the vascular pedicles were preserved. The halves were then ventrally rotated over the neourethra, one to the right and other to the left. Interrupted stitches were used to fix the flaps to the neourethra. The first flap was positioned longitudinally over the neourethra and second flap was transposed transversely exactly over the first flap covering it entirely. This approach creates a double breast flap on the neourethra. The glans and skin were closed conventionally. In all cases 6-0 polyglactin sutures were used. The urethroplasty was fashioned using a feeding tube (6 Fr or 8 Fr for younger patient, 10 Fr for older) and a compressive dressing was applied. Dressings were removed on 5th-7th postoperative day and stents were removed on 8th postoperative day. The patients were followed up after 2 weeks, 2 months and 6 months of operation. Statistical analysis was performed using SPSS for Windows version 13.0. Students 't' test and Chi-square test were used to see the level of significance.

Results

The mean (\pm SD) age of patients of group-A was 4.38 ± 3.31 years and that of group B was 5.34 ± 3.04 years. . The mean operation time was 75 ± 11.47 minutes in group A and 101 ± 13.84 minutes in group B. The operation time ranged from 90 to 130 minutes in group B. Urethrocutaneous fistula was observed in 06 (40%) patients of group A and in 01 (6.7%) patient of group B. The difference is statistically significant ($p=0.031$). In group-B, 01 (6.7%) patient developed mild penile torsion. Two months after operation 11 (73.3%) patients of group A and 13 (86.7%) patients of group B, had adequate urethral caliber.

Discussion

Hypospadias surgery must satisfy the basic requirements of regular voiding and correct sexual function in adulthood. Nevertheless, maintaining a healthy structure of the penis must also be a primary objective. The optimal surgical outcome should be a penis that is normal in function and structure, having the typical look of a circumcised penis. It should be straight during erection, with a vertical meatus in the middle of the glans and a single urinary stream⁷. Since 1995, the Snodgrass technique has widely been used by a large number of surgeons with good results. Urethrocutaneous fistula is the most common complication in hypospadias surgery. The rate of fistula reported in literature is ranged from 7-37%⁸⁻¹⁰. Many solutions are available to decrease the incidence of fistula, such as use of better suture materials, microsurgical instruments, magnification, silicone catheter or stents, reliable postoperative dressings and vascularized flaps to protect the neourethra.

Using Snodgrass urethroplasty in conjunction with a de-epithelialized layer of subcutaneous tissue to cover the suture line can help to prevent fistula formation¹¹. The double breast technique was derived from the concept that the largest part of a single flap of tissue is insufficient to cover the few millimeters of the neourethra width. Therefore overlapping the neourethra with 2 hemi-flaps would give better and thicker coverage, resulting in a better blood supply to all layers of the urethroplasty.

Recently overlapping of the double dartos flaps on the neourethra has been reported. Kamal B A observed no fistula formation with double Dartos flap¹². Mustafa et al reported the experience of a single surgeon, in which a 'U' shaped flap was prepared and the neourethra was covered with 2 flaps overlapping the sutures. In that series 3 fistulas resolved spontaneously¹³. Appignani A reported a new technique double cross flap protection during Snodgrass urethroplasty without fistula¹⁴. However Wilkinson et al in a systemic review reported a fistula rate of 3.3% with dartos flap¹⁵.

In the present series, one (6.7%) patient developed mild penile torsion. There are more chances of torsion in single flap as compared to double Dartos flap¹². Torsion may be grouped as mild ($<45^\circ$),

moderate (45°-90°) and severe (90°)¹⁶. Torsion of <30° does not require any corrective treatment¹⁷.

Conclusion

Hypospadias repair is among the most difficult problem in Paediatric Urology, as it demands the construction of a well functioning urethra and a good cosmetic appearance. The study revealed that the occurrence of urethrocutaneous fistula can be reduced by addition of vascularized preputial Dartos flap over neourethra in double breast manner to the Snodgrass urethroplasty. Double breast vascularized preputial Dartos flap reinforcement is simple to perform, and the flaps used to protect the urethroplasty are easy to obtain and manipulate. Snodgrass urethroplasty with double breast flap reinforcement can be done in all cases of mid and distal penile hypospadias.

References

1. Snodgrass W. Tubularized incised plate urethroplasty. In: Hadidi AT, Azmi AF, editors. *Hypospadias Surgery*. 1st ed. London: Springer-Heidelberg; 2003.p.155-161.
2. Gupta AK, Sarda D, Kothari PR, Jiwane A, Kulkarni BK. Tubularized incised plate urethroplasty with de-epithelized flap. *African Journal of Pediatric Surgery* 2008; 5(1): 8-10.
3. El-Kassaby AW, Al-Kandari AM, Elzayat T, Shokeir AA. Modified tabularized incised plate urethroplasty for hypospadias repair: A long term results of 764 patients. *Urology* 2008; 76: 611-615.
4. Shanberg AM, Sanderson K, Duel B. Re-operative hypospadias repair using the Snodgrass incised plate urethroplasty. *BJU International* 2001; 87: 544-7.
5. Djordjevic ML, Perovic SV, Slavkovic Z, Djakovic N. Longitudinal Dorsal Dartos Flap for prevention of fistula after a Snodgrass hypospadias procedure. *European Urology* 2006; 50: 55-57.
6. Perovic SV, Radojicic ZI. Vascularization of the hypospadiac prepuce and its impact on hypospadias repair. *J Urol* 2003; 169: 1098.
7. Mureau MAM, Slijper FME, Slob AK, Verhulst FC, Nijman RJM. Satisfaction with penile appearance after hypospadias surgery: The patient and surgeon view. *The Journal of Urology* 1996; 155: 703-706.
8. Braga LH, Lorenzo AJ, Soub M, Bagli DJ. Is statistical Significance Sufficient? Importance of Interaction and Confounding in Hypospadias Analysis. *The Journal of Urology* 2010; 184: 2510-2515.
9. Jan IA. Factors influencing the results of surgery for hypospadias. *J Pak Med Assoc* 2004; 54(11): 577-9.
10. Sarhan OM, El-Hefnawy AS, Hafez AT, Elsherbiny MT, Dawaba ME, Ghali AM. Factors affecting outcome of tubularized incised plate (TIP) urethroplasty: Single-center experience with 500 cases. *Journal of Pediatric Urology* 2009; 5: 378-382.
11. Snodgrass W, Koyle M, Manzoni G, et al. Tubularized incised plate hypospadias repair: results of a multicenter experience. *J Urol* 1996; 156: 839.
12. Kamal BA. Double dartos flaps in tubularized incised plate hypospadias repair. *Journal of Pediatric Urology* 2005; 66 (5): 1095-1098.
13. Mustafa M, Wadie BS, Abol-Enein H. Standard Snodgrass technique in conjunction with double-layer covering of the neourethra with dorsal dartos flap is the therapy of first choice for hypospadias. *Int Urol Nephrol* 2008; 40: 573-576.
14. Appignani A, Prestipino M, Bertozzi M, Nardi N, Falcone F. Double-cross flap protection: New technique for coverage of neourethra in hypospadias repair. *The Journal of Urology* 2009; 182: 1521-1527.
15. Wilkinson DJ, Farrelly P, Kenny SE. Outcomes in distal hypospadias: A systematic review of the Mathieu and tubularized incised plate repairs. *Journal of Pediatric Urology* 2010 Dec 13. [Epub ahead of print]
16. Fisher PC, Park JM. Penile torsion repair using dorsal dartos flap rotation. *The Journal of Urology* 2004; 171: 1903-1904.
17. Bhat A, Mandal AK. Acute post operative complications of hypospadias repair. *Indian Journal of Urology* 2008; 24: 241-248.