ORIGINAL ARTICLE

SURGICAL MANAGEMENT OF ANTERIOR HYPOSPADIAS: OUR EXPERIENCE WITH SNODGRASS REPAIR TECHNIQUE

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ABSTRACT

Background: There are various surgical techniques for hypospadias repair. The quest for an operative procedure with excellent results and minimal complications is still needed. This study was conducted to see the short term results of tubularized incised plate urethroplasty as described by Snodgrass in anterior hypospadias.

Material & Methods: This case series was observed at Surgical A Unit, Mardan Medical Complex, Mardan, from December 2009 to March 2011. Thirty-three children with anterior hypospadias were included. Inclusion criteria were anterior distal shaft hypospadias with good urethral plate and exclusion criteria were association with chordae and history of previous surgery. Urethral repair was done with Snodgrass method. Patients were followed for one year.

Results: Thirty-three patients underwent Snodgrass repair. The age of patients ranged from 2 to 12 years with a mean of 5.1 years. Among these 24 (72.7%) patients had distal penile and 9 (27.2%) midshaft hypospadias. Regarding complications, 3(9.1%) patients had small fistula formation in the early post operative period; 2 healed spontaneously and one required closure under general anaesthesia which was successful. Two patients had meatal stenosis which responded to meatal dilatation. One patient had glandular disruption which was repaired after 6 months. There was no incidence of urethral stricture, urethral diverticulum or any other major complication during the follow up.

Conclusions: The Snodgrass repair for anterior hypospadias has excellent cosmetic and functional results. Complication rate is low as compared to other procedures.

KEY WORDS: Hypospadias; Urethra; Urethral fistula; Urethral fistula.

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INTRODUCTION

The term hypospadias is derived from the greek word “hypo” meaning under and “spadon” meaning rent or fissure. It is one of the most common genital anomaly which affects aproximately 8.2 per 1000 live male births.[1] In this condition the urethral meatus is situated on the ventral surface of the penis, from just below the tip of glans to the perineum in severe cases. The etiology of hypospadias is not known. Various theories like vascular accidents, alpha reductase deficiency and androgen receptor deficiency may be involved.[2]

Hypospadias surgery was firstly attempted by Alexandrian surgeons Heliodorus and Antyllus during the first century A.D.[3]

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The most accepted classification of hypospadias is according to the meatal location. It is anterior in 65% to 70%, middle in 10-15% and posterior in 20% cases.[4] The goal of surgery are focused on the functional aspect of the repair, which permits voiding while standing and to allow effective coitus in adulthood. A number of procedures like MAGPI, Mustarde, Mathieu, Horton-Denin procedure, Snodgrass tubularized incised plate urethroplasty technique have been described to repair anterior hypospadias. There are about 300 different surgical techniques for hypospadias repair. The quest for an operative procedure with excellent results and minimal complications is still needed.[5]

This study was conducted to see the short term results of tubularized incised plate urethroplasty as described by Snodgrass in anterior hypospadias.

MATERIAL AND METHODS

This case series was observed at Surgical A Unit, Mardan Medical Complex, Mardan from December 2009 to March 2011. Thirty-three patients

with anterior hypospadias without chordae with age range of 2 to 12 years were included. Inclusion criteria were anterior distal shaft hypospadias with good urethral plate and exclusion criteria were association with chordae and history of previous surgery. All patients were admitted one day prior to surgery though outpatient department. Routine investigations like blood complete, bleeding time, clotting time and screening for hepatitis was done in all cases.

For Snodgrass repair a U shaped incision was made extending along the edges of the urethral plate to the healthy skin 2 mm proximal to the meatus. The urethral plate was then incised in the midline from the meatus distally. The edges of the U shaped incision were dissected free from the fascia for a tension free repair. The incised tube was then repaired with Polygalactine 6/0 suture over a size 6 Fr or 7 Fr stent. Neourethra formed was covered with subdartos fascial layer. The glandular wings, mucosal collar and ventral shaft skin were closed in midline. Stent provided urinary diversion for one week. Pressure dressing in the form of bactigrass placement over the repair was done. All patients were sent home along with stent on oral antibiotics and analgesics. They were advised to revisit after one week, for removal of stent under general anaesthesia. Patients were followed afterwards in outpatient dapartment at interval of one month for one year. Any complication occurring during the procedure were noted.

RESULTS

Thirty-three patients underwent Snodgrass repair during this study. The age of patients varied from 2 to 12 years with a mean of 5.1.

Out of 33 patients 24 (72.7%) had distal penile and 9 (27.2%) midshaft hypospadias. Three (9.1%) patients had small fistula formation in the early post operative period. Out of 3 fistula formation 2 healed spontaneously and one required closure under general anaesthesia which was successful. 2 patients had meatal stenosis which responded to meatal dilatation. One patient had glandular disruption which was repaired after 6 months. Cosmetic results were good in our study. There was no incidence of urethral stricture, urethral diverticulum or any other major complication during the follow up. (Table 1)

Table 1: Complications associated with Snodgrass hypospadias repair.

S. No.	Complication	Number	Percentage
1	Urethrocutaneous fistula	3	9.1%
2	Meatal stenosis	2	6.5%
3	Glandular dehiscence	1	3.03%

DISCUSSION

Hypospadias with an incidence of 8 per 1000 live male births is a common clinical problem in the majority of cases the abnormal meatus is located in the glandular, coronal and subcoronal levels or in the distal part of shaft. The goal of modern hypospadias surgery is a functionally and cosmetically normal penis. More than 300 methods have been introduced throughout the 125 years history of hypospadias repair[6].

Earlier many of the distal hypospaias were repaired by meatal based flip flap procedure (Mathieu procedure). This repair produced a glandular meatus with a rounded opening in contrast to the vertical slit like opening of meatus.[7] Rich et al introduced the principal of incising the urethral plate in midline to improve the cosmatics of repair in 1989.[8] In 1994 Snodgrass advanced the concept by extending the incision of urethral plate from the meatus to the tip of glans.[9] This maneuver allowed construction of a new method from the existing urethral plate. Re-epitheliazation of the relaxing incision without obvious scarring occurs, which allows the incised edges to remain separate.[10]

Our experience with Snograss repair was excellent. Cosmetic results were good, meatal allignment and position were excellent. The optimal age for performing this procedure is 2-3 years but most of our patients were mostly older. Din I U reviewed Snodgrass repair results in his study and found satisfactory outcome of the procedure.[11] In comparison to Mathieu procedure the cosmetic results are much superior. Khan MA[12], Haq AU[5], Moradi M[13] compared the functional and cosmetic aspect of Snodgrass repair to Mathieu repair and found it cosmetically and functionally superior to Mathieu repair.

Holland and Smith[14] repaired distal penile hypospadias with tubularized incised plate urethroplasty with complication rate of 22%.Iane S Palmer et al[17] had success rate of 90% with tubularized incised plate urethroplasty. Shanberg et al[15] performed reoperative tubularized incised plate urethroplasty in 13 patients and had 14% complication during his study. Earl et al[16] performed Snodgrass repair for distal and proximal hypospadias and obtained 99% success.

Complication rate of Snodgrass repair ranges from 2 to 18%.[18,19] In our study we had a complication rate of 18%, which included fistula formation, meatal stenosis and glandular dehiscence. These results are comparable to the studies done by Snodgrass (16%),[9] and Din et al(16%).[11]

Din et al[11] observed urethrocutaneous fistula in 10%, meatal stenosis in 6% and glans dehiscence in 2%. Urethrocutaneous fistula formation remained the major complication in our study (9.1%). Multiple factors could be involved in the formation of urethrocutaneous fistula formation like improper mobilization of flaps during dissection, pressure necrosis due to tight dressing and some degree of meatal stenosis.

Snodgrass repair can be successfully used in the more severe proximal forms of hypospadias[17,20]. This procedure is safe and reliable technique, provides excellent cosmetic results and has a low complication rate.[22] Healing of the incision in the dorsal urethral plate occurs by reepithilization with normal tissue ingrowth. In contrast, the sutured closure heals with a desmoplastic and inflamatory response.[23] Oswald et al compared incised plate urethroplasty with Mathieu rapair and found the former the preferred technique with only 3% complication rate.[24]

In summary, tubularized incised plate urethroplasty showed adequate results to treat both distal and proximal hypospadias. Second layer of Dartos fascia reduced the rate of fistula formation.

CONCLUSION

Snodgrass urethroplasty provided the best possible method to treat all types of hypospadias but with its limitations to intact urethral plate. Complications can be minimized by applying second layer of Dartos fascia, improving surgical skills, avoidence of hematoma formation and prevention of infection.

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CONFLICT OF INTEREST
Authors declare no conflict of interest.
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