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Surgical Repair of Mid-penile to Distal Hypospadias in Children; Report of 93 Cases

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Author`s Contribution

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ABSTRACT

Objective: To present the single surgeon's experience in surgical repair of mid-penile to distal hypospadias in a series of 93 cases.

Methodology: This is a retrospective study of management of patients of mid penile to sub coronal hypospadias at a median age of 24 months between June 2011 to August 2021. All the children were followed up for 6 months. Eighty-three children were between the age of 1 to 4 years and 10 children were from the age of 5 to 8 years. All the patients underwent physical examination to confirm the diagnosis and to exclude associated anomalies. All the children having mid penile to sub coronal hypospadias were included. All children with glanular hypospadias were excluded from the study. The repair was done under general anesthesia while using tubularized incised plate (TIP) technique.

At completion of surgery compression dressing with transparent Tagaderm was used for one week in all the patients.

Results: All of 90 patients had excellent cosmetic and functional outcome. Only 3 patients developed fistula which needed surgical intervention.

Conclusion: Surgical repair of mid penile to sub coronal hypospadias by tubularized incised plate (TIP) technique is safe and effective. Compression dressing with transparent Tegaderm prevents complications of hematoma formation and wound infection.

Key words: Hypospadias, Tabularized incised plate, urethral fistula, Chordee.

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Introduction

Hypospadias in children is a congenital anomaly characterized by ventral placement of urethral meatusand arrested development of fore skin.[1]

Hypospadias is seen in 1 in 200 to 300 live births. The urethral opening may be from glans to scrotum/perinium. There is usually no association of upper urinary tract congenital anomalies in distal hypospadias and routine abdominal ultrasound is not indicated in asymptomatic patients with otherwise unremarkable systemic examination.[1,2] One third of cases of hypospadias are associated with chordee. [3,4]

The patients may experience negative self-image and bothersome urinary spraying if surgery is delayed. The goal of hypospadias surgery is to achieve three objectives: voiding in an upright position, an appropriate voiding stream, normal penile appearance and function.[2-5] For many surgeons' decision making among various techniques still relies on subjective analysis of the anatomy and personal preferences. Comparison between operations is mostly based on relative urethroplasty complication rates. In 1994, Warren T Snodgrass described his technique of tubularized incised plate urethroplasty (TIP) consisting of deep longitudinal midline incision of dorsal urethral plate is a one stage procedure and proved to improve complication rates and cosmetic results.[6-9] It has become the standard technique for distal hypospadias correction. We used dorsal prepuce subcutaneous flap (DPF) to cover the suture line to prevent urethrocutaneous fistula formation. We also limited urethral plate incision till 2 mm behind the neo-meatus to avoid meatal stenosis. In this series we evaluated the rate of urethrocutaneous fistula and

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meatal stenosis. Successfully performing this procedure requires experience and is described as a learning curve. Despite the technical advances distal hypospadias repair remains a challenge.[10-14]

The aim of this study is to present single surgeon's experience with reference to outcomes of repair of mid penile to distal hypospadias by TIP technique and review of current literature to compare outcomeswith published literature in a series of 92 boys.

Methodology

This is a retrospective study of management of 93 consecutive patients of mid-penile to distal hypospadias with median age of 24 months who underwent repair between June 2011 and August 2021in a single institution. All the cases were operated by a single pediatric surgeon. Only children diagnosed with mid penile to distal hypospadias were included in this series. All the patients were referred by primary health care centers. The relevant investigations were within normal range. Eighty-three children were between the age of 1 to 4 years and 10 children were between the age of 5 to 8 years as mentioned in table I. All the patients were given appointment for elective admissions through out- patient-clinic one day prior to surgery. The repair was done under general anesthesia by TIP technique developed by Snodgrass consisting of deep longitudinal midline incision of dorsal urethral plate.

Table I: No. of patients according to age groups.

Age	No of Patients
1 to 2 Years	59
2 to 5 Years	26
5 to 8 Years	8
Total	93

Degloving of penile skin was done to release associated chordee. Dortos flap was used to cover the suture line after tabularization of urethral plate. Circumcision was done at completion of hypospadias repair (figure 1-6). At the completion of surgery bladder catheter was fixed and compression transparent Tegaderm dressing, to prevent hematoma formation and wound infection was done for one week. Thedressing and the catheter was removed prior to discharge home. All the children were seen in outpatient clinic after one week and then followed up after one, three and 6 months, as well as when required. Three patients developed urethrocutaneous fistula and needed surgical intervention as mentioned in table II.

Figure 1. Distal Hypospadias

Figure 2. Association of Chordee

Figure 3. Degloving to release chordee

Figure 4. Tubularization of incised urethral plate

Figure 5. Suture line covered with Dortos flap

Figure 6. Skin closure with circumcision

Table II: Incidence of Urethral Cutaneous Fistula and Related Complications in Patients Requiring Surgical Intervention

Complications	No. of Patients	Percentage of complications
Glans disruption	0	0
Meatal stenosis	0	0
Urethral stricture	0	0
Urethral cutaneous fistula	3	3.2

Results

The age of patients at operation varied from 1 to 8 years, median age was 24 months. All 90 patients had excellent outcome. Only 3 patients developed urethrocutaneous fistula which needed surgical intervention 6 months after the first surgery. All the parents were pleased with the outcome at the timeof discharge home and on follow up.

Discussion

The incidence of hypospadias is one out of 300 male births.[1,15] Snodgrass urethroplasty called tubularized incised plate urethroplasty (TIP) has become a standard procedure for distal hypospadias correction. Its versatility with normally appearing meatus, has made it a preferred technique.[6,16] The most feared complications after TIP repair are urethrocutaneous fistula and meatal stenosis. Different technical pints were raised to decrease the incidence of fistula formation. Thus second layer cover flap was agreed as an important step. Dorsal prepucial flap (DPF) was the one used by Snodgrass himself to cover his repair.[8,17]

Mid penile to distal hypospadias is commonly managed as a single stage repair.[11,18] The treatment aims at release of associated chordee, voiding in an upright position with an appropriate voiding stream,normal penile appearance and function. For many surgeons, decision making among various techniquesstill relies on subjective analysis of the anatomy and the personal preferences. Literature shows variety of approaches to correct this condition.[15,19] We used the TIP technique developed by Snodgrass consisting of deep longitudinal midline incision of dorsal urethral plate is proved to improve complication rates and cosmetic results.

TIP technique for repair of mid penile to coronal hypospadias in a series of 93 patients.Degloving of penile skin up to the base was done to release associated chordee. We used tubularization in two layers, namely the first subepithelial together with a second reinforcing one. We rotated the flapfrom one side and covered the repair to prevent urethrocutaneous fistula without any penile torsion.

We encountered complication of urethrocutaneous fistula in 3 patients (2.8%) which falls well within therange of complication rates identified in the literature review for mid penile to distal hypospadias using the same technique[16,19] All of the remaining 90 patients (97.2%) had satisfactory correction withgood functional and cosmetic results.

Meatal stenosis generally occurs in up to 7% of patients after hypospadias repair. Extending urethralplate incision till the site of the neomeatus is considered as a predisposing factor.[17-20] We did notinclude the neomeatus site into the plate incision to prevent meatal stenosis.

In a study published in urology journal 2021 analysis was presented for 147 patients managed betweenJuly 2008 and July 2019. In this study the complications were seen in 9 patients (6.1%) using TIP technique for mid penile to distal hypospadias repair.[15,21-23]

Operative time is often a concern in academic institutions.[22,23] This is especially in children under 3 years of age where prolonged anesthesia may have effect on brain development. Our mean operative time of 70 minutes is similar to the reported operative time in the literature using TIP technique.[24-28] We used dorsal fore skin to harvest dartos flap in between suture lines. There is always a learning curve for this technically demanding procedure.[29-32]

Conclusion

Our series showed that in Snodgrass repair of distal hypospadias, two layer tubularization, together with harvesting of thick dorsal subcutaneous prepuce flap, decreases the fistula formation. Extending the plate incision 2 mm behind the neomeatus site prevents meatal stenosis.

Surgical repair of mid penile to distal hypospadias in children using TIP technique is safe and effective. The cosmetic and functional results are quite satisfactory. There is a learning curve for this technically demanding procedure.

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