



COMPLICATIONS OF HYPOSPADIAS SURGERY: EXPERIENCE IN A TERTIARY CARE HOSPITAL

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ABSTRACT

Background: More than 250 different techniques have been described for the management of hypospadias. Tubularised incised plate urethroplasty (TIPU) is now used in most centers for the management of anterior hypospadias. The aim of this study was to review the types of operations done for hypospadias, to analyze the results and complications of these operations and discuss the factors contributing to the complications.

Methods: This is an observational study analyzing the age at surgery, type of hypospadias at presentation, types of operations done, complications, and results of surgeries.

Results and conclusion: TIPU remains the most common surgery done for anterior hypospadias. Urethrocuteaneous fistula is the major complication. Factors that affect the complication rate include width of urethral plate, type of stitch used, suture technique, infection during immediate post operative period, suturing with tension, the use of a covering protective layer and the expertise of the surgeon.

KEYWORDS : Hypospadias, urethrocuteaneous fistula, Snodgrass

INTRODUCTION

More than 250 different techniques have been described for the management of hypospadias.⁽¹⁾ Recently, with a better understanding of the principles in the surgical management of hypospadias, fewer operations are being used for managing hypospadias in various centers with acceptable complication rates. Tubularised incised plate urethroplasty (TIPU) is now used in most centers for the management of anterior hypospadias (glanular, subcoronal, coronal, distal penile, mid penile) after it had been popularised by Snodgrass.⁽²⁾ Meatal advancement and glanuloplasty incorporated (MAGPI) is used in some centers for the management of anterior hypospadias.⁽⁴⁾ For proximal hypospadias, a variable number of methods are used. While some use two-stage methods, others use single-stage methods.

The aim of this study was to review the types of operations done for hypospadias in the Paediatric Surgery department of our hospital, to analyse the results and complications of these operations and discuss the factors contributing to the complications

METHODS AND MATERIALS

This is an observational study analyzing the age at surgery, type of hypospadias at presentation, types of operations done, complications, and results of surgeries from August 2018 to March 2020 at the Paediatric Surgery department of V. S. Hospital and SVPMSR, Ahmedabad.

A total of 62 patients were studied during this time. The age at which surgery was done varied from 18 months to 14 years of age.

Regular follow-up was done for all the cases to assess the post-operative outcome and to diagnose any post-operative complications.

RESULTS

A total of 62 patients were operated during the period from August 2018 to March 2020. The age at which surgery was done varied from 18 months to 14 years of age.

The types of hypospadias were glanular, coronal, distal penile, mid penile and peno-scrotal.

The surgeries done at our centre were MAGPI for glanular and certain coronal cases, Snodgrass TIPU for certain coronal, distal and mid penile and Bracka stage 1 and 2 for penoscrotal hypospadias.

Pre-operative Testosterone was used only for the cases of Penoscrotal hypospadias.

Three intra-muscular injections of testosterone were given at a dose of 2mg/kg/dose at three week intervals and surgery was planned at 3 weeks after the last dose.

The various presentations of hypospadias, the types of surgery performed in each, and the complications of each surgery are displayed in [Table 1-4].

[Table 1]

Type of Hypospadias and the surgery performed				
Type	Number of cases	MAGPI	TIPU	Bracka-1
Glanular	10	10		
Coronal	20	6	14	
Distal Penile	20		20	
Mid Penile	6		6	
Penoscrotal	6			6
Total	62	16	40	6

[Table 2]

Complications of Snodgrass TIPU		
Complication	Frequency n=40	Frequency %
Infection	6	15.00%
Edema	8	20.00%
Meatal stenosis	8	20.00%
UC fistula	6	15.00%
Excess residual skin	1	2.50%
Suture tracts	4	10.00%
No complications	27	67.50%

[Table 3]

Complications of Meatal advancement and Glanuloplasty Incorporated(MAGPI)		
Complications	Frequency n=16	Frequency %
Meatal stenosis	2	12.50%
Retracted Meatus	1	6.25%
No complications	13	81.25%

[Table 4]

Complications of Bracka-1		
Complication	Frequency n=6	Frequency %
Graft rejection	1	16.67%
No complications	5	83.33%

DISCUSSION

The multiple surgical options available for hypospadias repair are a testament to the fact that no surgical procedure guarantees universal success by all surgeons. As is true for all reconstructive procedures, the best chance of a good outcome is with the first operation.^[5] All hypospadias surgery, even for an innocuous-appearing distal hypospadias, must, therefore, not be considered a minor procedure. The position of the meatus is not the sole determinant of the difficulty in reconstruction. Distal hypospadias can be associated with a more technically demanding repair due to small glans size, poor quality of the urethral plate, proximal spongiosal hypoplasia, and possible ventral curvature (VC). Therefore, all hypospadias surgery should preferably be performed by a competent hypospadiologist, who ideally has an annual hypospadias surgical volume of 40–50 cases.^[6]

The common complications^[7] following hypospadias repair include:

1. Infection (acute stage)
2. Local edema (acute stage)
3. Bleeding (acute stage)
4. Urethrocutaneous fistula
5. Meatal stenosis
6. Urethral stenosis
7. Glans dehiscence
8. Urethral diverticulum or urethrocele, which can lead to infections and post-void dribbling
9. Cosmetic issues: Excess residual skin, skin tags, inclusion cysts, skin bridges, suture tracts
10. Hair-bearing urethra
11. Recurrent or persistent penile curvature
12. Spraying or misdirected urinary stream and/or irritative symptoms
13. Erectile dysfunction
14. Balanitis xerotica obliterans of the urethra leading to strictures

The management of complications is done after a period of healing over 4–6 months, with the exception of urethral or meatal stenosis, which require more emergent attention. Urethral fistula closures involve excision and closure of the fistula with adequate dartos flap coverage after excluding distal urethral stenosis. Coronal or more distal fistulas may also require a redo glansplasty. Symptomatic meatal stenosis will often require a dilatation or a meatotomy. Glans dehiscence can be managed with reoperative glansplasty.^[7]

Most centers use TIPU for anterior hypospadias while some MAGPI.^[4] In our centre, TIPU was used in 64.5% of the cases. 15% patients had urethro-cutaneous fistulae. In various centres, this complication varies between 3% and 33% when used for distal hypospadias.^[8]

Urethro-cutaneous fistula was seen to result in the patients who had infection and edema in the acute post-operative phase. Each patient with fistula had an associated meatal stenosis.

Factors that affect the fistula rate include type of hypospadias, age at surgery, width of urethral plate, type of stitch used for urethroplasty, suture technique, infection during immediate post operative period, suturing with tension, the use of a covering protective layer, and the use of a urethral stent.^[11,12]

The surgeon of whichever speciality should have a dedicated

interest in this challenging work, ideally having an annual volume of at least 40-50 cases. The ideal time for primary repair is at 6-12 months old, although when this is not practicable there is another opportunity at 3-4 years old.^[6] A urethral plate narrower than 8mm width was associated with a higher complication rate.^[9] A subcuticular technique had fewer complications as compared with through and through repair.^[11,12] In our centre, a dartos flap dissected from the dorsal part of the prepuce, button holed and brought ventrally was used in as a protective layer.

Meatal stenosis is another important complication of TIPU. This complication ranges between 0% and 17% in various studies. Factors that affect the stenosis rate include incising the plate too far to the tip of the glans and the use of a large urethral stent causing pressure on the meatus.^[8] The size of the neo-meatus may also contribute to this complication since healing is always associated with some narrowing. In our study, 20% of the patients had meatal stenosis after TIPU. In order to ensure an adequately sized meatus, the glans wings were developed in such a way as to have a long flap which was closed in the midline with a rotation of the flaps so as not to cause pressure on the repair. Dilatation after TIPU was not done postoperatively as a routine. An attempt was made to ensure that the size of the meatus was 10 French. The size of the stent used was either 6 or 8 French depending on width of the urethral plate. This was to ensure minimal tension on the repair and meatus. It was left in-situ for 8 to 10 days.

The key surgical principles to achieve optimal surgical outcomes include the use of magnification, fine instruments and sutures, minimal and atraumatic tissue-handling, careful hemostasis, and good surgical assistance.^[6] We used infiltration of diluted adrenaline and a tourniquet to ensure an avascular field and released at intervals of 30-45 min as has been done by others.

MAGPI was used for glanular hypospadias with a deep glanular groove.^[4] Meatal stenosis was seen in 12.5% patients and retracted meatus was seen in 6.25% patients.

For proximal hypospadias with chordee, Bracka-1 was employed, where a free prepuce graft was used to form the urethral plate at our centre. In this study, graft rejection in the form of graft stricture was seen in a single patient making it 16.67%. In literature, complication rates between 32 and 57% were reported, with graft stricture and meatal stenosis being most common.^[13] The second stage was performed in one patient 6 months after the first surgery who had no complications.

CONCLUSIONS

Hypospadias surgery remains challenging and continues to be associated with a number of complications. Despite a large number of available operations, one may successfully manage these patients with a few well selected operations. Careful selection of patients and attention to detailed technical factors may help reduce the complication rate. TIPU remains good option for most patients with anterior hypospadias.^[8,10]

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