

STUDY OF HYPOSPADIAS IN A TERTIARY CARE HOSPITAL IN COASTAL ANDHRA PRADESHVenkata Ramana Poondla¹, Himaja Ravi², Rajendra Prasad Gorthi³¹Designated Associate Professor, Department of Paediatric Surgery, Andhra Medical College, Visakhapatnam, Andhra Pradesh, India.²Resident, Department of Paediatric Surgery, Andhra Medical College, Visakhapatnam, Andhra Pradesh, India.³Professor and HOD, Department of Paediatric Surgery, Andhra Medical College, Visakhapatnam, Andhra Pradesh, India.**ABSTRACT****BACKGROUND**

Hypospadias is the commonest paediatric urological condition with an incidence of 1 in 125 male children. The condition can be easily recognized by the attending neonatologist/ paediatrician in the neonatal period. The ideal time for urethral reconstruction is at one year of age and all the staged repairs are to be completed by the time the child goes to school.

METHODS

We wanted to study the clinical features and outcome of hypospadias cases in the paediatric age group. Children with hypospadias in the age group of 1-10 years are taken up for the study. 51 children were admitted for hypospadias repair with Proximal as well as Distal hypospadias. They were surgically reconstructed with time tested procedures. These children are observed and are on regular follow up for 6 months in the post-operative period.

RESULTS

46 new and 5 redo hypospadias repairs were done from January 2017 to August 2018 with 6 months post-operative follow up till February 2019. Satisfactory surgical outcome was achieved with an acceptable complication rate of 9 percent and 20 percent for fresh and redo hypospadias cases respectively.

CONCLUSION

Most of the children with hypospadias presented at around 5-years of age. As the goal of hypospadias repair is to achieve a normal urinary stream with cosmetically satisfactory penis before school going age, there is a need for early recognition and surgical intervention in these children to achieve optimum results and also to prevent psycho social consequences.

KEY WORDS

Hypospadias, Disorders of Sex Development, Testosterone Propionate, Urethroplasty

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BACKGROUND

Hypospadias is defined as an arrest in normal development of the urethra, foreskin, and ventral aspect of the penis. The incidence of hypospadias has increased over the past 15 years in several Western countries¹. With an incidence of one in 200 live male births, hypospadias correction is one of the common surgical procedures performed.

Three associated anomalies are classically found-

1. An ectopic opening of the urethral meatus located at any place between the glans and the base of the penis,
2. A ventral curvature of the penis (Chordee),
A hooded foreskin with a marked excess of skin on the dorsum of the penis and a lack of skin on the ventral aspect.

The standard classification of hypospadias is based on location of the urethral meatus: distal, midshaft, or proximal, which is an insufficient criterion to define the severity of this malformation.

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The following classification is based on the level of division of the corpus spongiosum and is of practical help when deciding which surgical procedure to use-

1. Glandular hypospadias: The ectopic meatus is situated on the glans tissue behind the normal site and they can be associated with a marked Hypoplasia of the distal urethra and a glans tilt or Chordee.
2. Distal division of the corpus spongiosum associated with little or no Chordee (Figure 1).
3. Proximal division of the corpus spongiosum associated with Chordee. Paradoxically, these cases have a better outcome.
4. Hypospadias cripples. These are patients who have already undergone several procedures that failed, leaving them with scarred tissues.²

METHODS

All cases, irrespective of their age are managed for hypospadias at the Paediatric surgery department, KGH, Vizag from January 2017 to august 2018 were included. The data was retrospectively studied regarding the age at presentation, type of hypospadias, type of procedure done and postop complications. The follow up period was from 1 to 6 months.

Surgery for correcting hypospadias involves three main steps-

1. Correction of Chordee (Figure 2).
2. Reconstruction of the urethra (Urethroplasty);

- Reconstruction of the tissues ventrally to give a good cover to the reconstructed urethra (i.e., glans, corpus spongiosum, and skin).

Correction of Chordee

The chordee might still persist in less than 5% cases, and a dorsal plication of the corpora cavernosa is then needed.³

Urethroplasty

Many procedures like Thiersch-Duplay, Mathieu flip-flap, Asopa-Duckett or a tube of buccal mucosa or the Koyanagi procedure have been described.

Penile Covering

Spongioplasty, Meatoplasty, Glanuloplasty

Currently following techniques are commonly used⁴⁻

Glandular hypospadias

MAGPI described by Duckett.⁵

Procedures for Distal hypospadias

Thiersch-Duplay procedure.

The Snodgrass Procedure

The results are good with a fistula rate of 2% and a glans dehiscence rate of 3%. A 9% complication rate have been reported, including Meatal stenosis (3%), fistula (5%), partial glans dehiscence (9%), and stricture (2%).

Koff Procedure⁶

A complete mobilization of the penile urethra (Koff procedure) is done to position the urethral meatus at the right place. The Koff repair has a very low fistula rate, but Meatal stenosis appears in about 20% of cases, probably because of a distal ischemia.

Mathieu Procedure⁷

Distal strictures are rare (1%), and fistulas are met in 4% of the cases (0.5% Meatal retraction and 1% Urethrocutaneous fistulas).

Proximal hypospadias⁸

The first choice for many is a Pedicled flap of Preputial mucosa that is harvested on the dorsal aspect of the penis and transferred to its ventral side. Onlay Urethroplasties avoiding circular urethral anastomosis are favoured nowadays, because secondary strictures are far less common with these types of reconstruction. The Snodgrass procedure,⁹ also called Tubularized Incised Plate (TIP) Urethroplasty, has been used to correct proximal hypospadias where there is absence of severe penile curvature and the urethral plate has a supple appearance. Alternatives for reconstruction of severe proximal hypospadias include the Koyanagi repair and its modifications. Multistage Procedures (Figure 3 and Figure 4) Bracka.¹⁰

Complications¹¹

Urethrocutaneous fistula, meatal stenosis, urethral stenosis, glans dehiscence, urethral diverticulum or urethrocele, which

can lead to infections and post-void dribbling, cosmetic issues: excess residual skin, skin tags, inclusion cysts, skin bridges, suture tracts, hair-bearing urethra, recurrent or persistent penile curvature, spraying or misdirected urinary stream and/or irritative symptoms, erectile dysfunction, balanitis xerotica obliterans of the urethra leading to strictures.

RESULTS

Over 300 different operations have been described for the management of hypospadias. In recent times, the numbers of operations used in various centres have gradually reduced as the principles necessary to ensure adequate cosmetic and functional results with minimum complications¹² are better understood.

The mean age at presentation was 5.75 yrs. (Table 4). Penoscrotal hypospadias was the most common type followed by anterior hypospadias (table 2). Byars staged procedure was the most common repair done (table 3). Out of all the procedures done single stage were 55%. Postop complication rate was 12.5% in which urethra-cutaneous fistula was the most common (Table 5). Out of 51 cases 90% were fresh cases and 10% were re-operated. The complication rate was 9% and 20% in fresh and redo cases respectively.

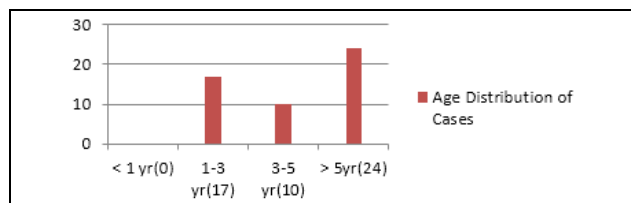


Table 1. Age Distribution of hypospadias

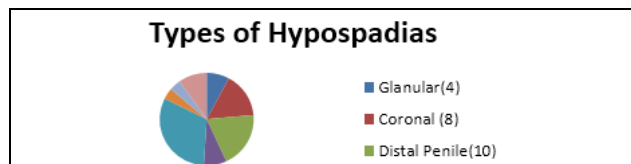


Table 2. Types of hypospadias Cases

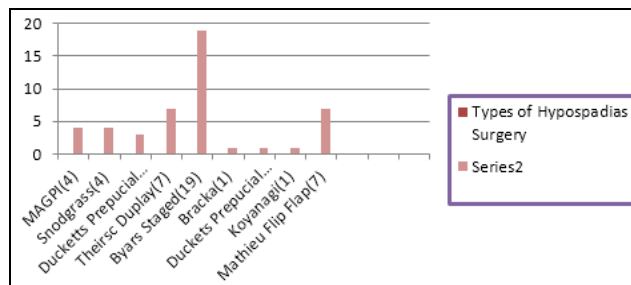


Table 3. Types of hypospadias Surgery

Study	Mean Age at Presentation (Years)	Type of hypospadias	Opted Procedure
Mansoor khan et al	8.12	Mid Penile	Two Stage Bracka
Abdul Rahman et al		Anterior	MAGPI
Present Study	5.75	Peno Scrotal	Byars Two Stage

Table 4. Comparison with Studies Carried out in Other Parts of India

Study	Complication	Complication Rate
Mansoor Khan et al	1. Oedema	28.3%
	2 Urethro Cutaneous Fistula	26.6%
Huang et al	1 Urethro Cutaneous Fistula	14.6%
Bush et al	1 Urethro Cutaneous Fistula	11.5%
Present Study	1. Oedema	2.5%
	2. Urethro Cutaneous Fistula	12.5%

Table 5. Comparison of Complication Rates with Other Studies

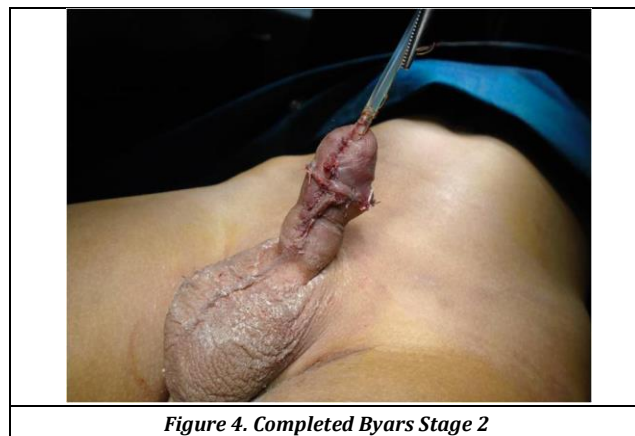


Figure 4. Completed Byars Stage 2

Management of Complications

The management of hypospadias repair complications are performed 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 re-operative glansplasty. When a redo urethroplasty is required, the degree of postoperative scarring and the possibility of balanitis xerotica obliterans (BXO) may dictate re-operative management. A redo TIP procedure can be a viable option in the presence of a non-scarred urethral plate or primary glans dehiscence.¹³ In the absence of dorsal preputial tissue, a buccal graft harvested from the lip or cheek can be used to perform a staged redo procedure for more scarred or proximal repairs.

DISCUSSION

The incidence of hypospadias is about 8.2 per 1000 live male births.¹⁴ In the last 30 years, there is an increase in the prevalence of hypospadias.^{15,16,17,18} The aim of hypospadias surgery is to obtain a functional and cosmetically normal penis. Surgery for hypospadias remains one of the most challenging problems in paediatric urology. More than 300 different surgical techniques have been described in the treatment of hypospadias. This gives testimony to both surgical ingenuity in dealing with hypospadias and the dissatisfaction among previous procedure.¹⁹ The mean age at presentation in our study was 5.75 yrs. compared to the study done by Mansoor Khan et al²⁰ in which it was 8.12 yrs. The median age of presentation in a study done by Pramod S et al²¹ was 4 years with a range of 9 months to 14 years.

With the improvement in paediatric anaesthesia and microsurgical techniques, children at younger age can be operated without increased risk.²² After analysing various factors such as sexual orientation, genital awareness, and separation anxiety Schultz and co-workers advised repair between 8 and 14 months.²³ Manley and Epstein also observed disturbing behavioural changes in boys undergoing hypospadias repair between the ages of 2 and 6 years. Following the above finding, they reduced the age to 10–18 months. By doing this, they noted improvement emotionally and psychologically compared to the older age group. Boys undergoing staged hypospadias repair, did significantly

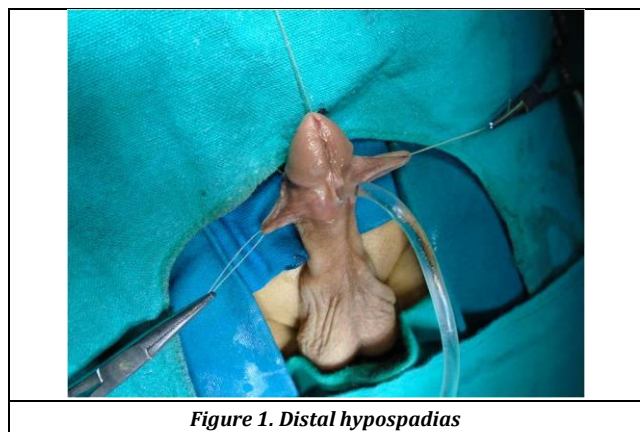


Figure 1. Distal hypospadias

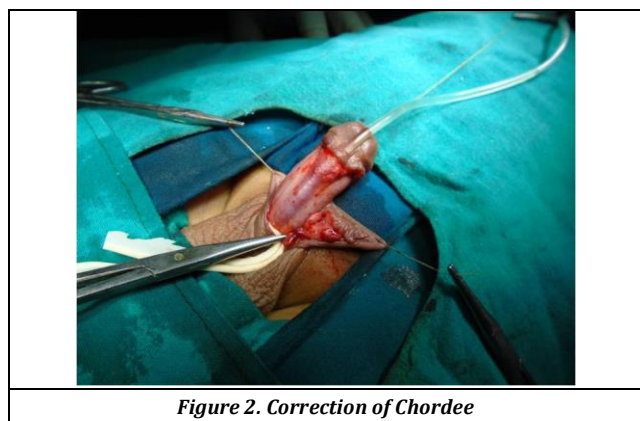


Figure 2. Correction of Chordee

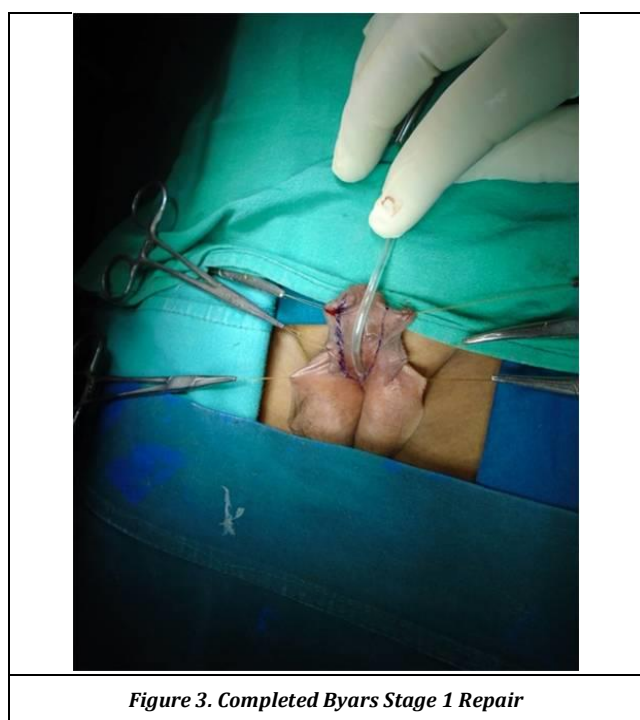


Figure 3. Completed Byars Stage 1 Repair

better psychologically with one stage repair at age 6 months compared to those undergoing two stage repairs at age 3 years.²⁴ At present, the recommended age of surgery is between 6 and 18 months.²⁵

The most common type of hypospadias in our study is Penoscrotal wherein compared to other studies it was mid-penile in Mansoor khan et al²⁰ and anterior in Abdul Rahman et al²⁶. This incidence is seen because our hospital being a tertiary care Centre and a referral hospital Penoscrotal hypospadias is the most common.

The most common type of operative procedure performed in our study was Byars two stage whereas in other studies Mansoor khan et al²⁰ it was two stage Bracka and Abdul Rahman et al²⁶ it was MAGPI. The most common complication and their rate in our study was oedema (2.5%) and Urethrocutaneous fistula (12.5%). This was compared to other studies like Mansoor khan et al²⁰ where the complications were oedema (28.3%) and Urethrocutaneous fistula (26.6%). In Huang et al²⁷ it was Urethrocutaneous fistula (14.6%) and in Bush et al²⁸ it was Urethrocutaneous fistula (11.5%).

In Pramod S et al study²¹ Urethrocutaneous fistula was the most common complication seen in 10% of the children. In the literature, the median fistula rate was 5%, ranging from 0% to 16% among the 54 case series reviewed.^{29,30,31} The factors influencing fistula formation was studied by Waterman.³² He found that technique of primary repair was important, and there was no difference between stent versus non-stent and age of child at the time of surgery. Two sites vulnerable to fistula are the sub-coronal area and the penoscrotal junction. Various factors responsible for Urethrocutaneous fistula are improper mobilization of the flap during dissection, some degree of meatal stenosis, and pressure necrosis due to tight dressing.

The outcomes of distal hypospadias repair are favourable, with a low incidence of redo surgery, but complications are encountered in 5–10 % cases. A systematic review of outcomes of the TIP urethroplasty and the Mathieu procedure for distal hypospadias showed a lower fistula rate in the TIP group (3.8% vs. 5.3%) and a lower stenosis rate in the Mathieu group (0.7% vs. 3.1%).³³ Complication rates for proximal hypospadias with severe curvature show a high and variable complication rate of 15–56%.^{34,35}

The Koyanagi repair has shown favourable results for proximal hypospadias, with a 17% complication rate in a series of 151 proximal hypospadias children.³⁶ The use of preoperative androgen stimulation, tunica vaginalis flap coverage of the repair, and extended glans wings dissection are other factors presumed to decrease complication rates.

Urethroplasty complications doubled in people undergoing a second hypospadias urethroplasty compared with those undergoing primary repair. The complication rate in our study also doubled in re operated cases. In primary repairs it was 9% and whereas in re operated cases it was 20%.

A single re-operative hypospadias urethroplasty has twice the risk for additional complications vs. the primary repair, which increases to 40% with three or more re-operations. These results support a theory that vascularity of penile tissues decreases with successive operations, and suggest the need for treatments to improve vascularity. The higher risk for complications during re-operative

urethroplasties also emphasizes the need to get the initial repair correct.³⁷

CONCLUSIONS

The mean age at presentation was 5.75 yrs. This is in contrary to the guidelines for timing of hypospadias surgery between 6-18 months. This is attributed to lack of awareness, literacy rate and financial restraints. The most common postop complication was urethra-cutaneous fistula reported in 12.5% of cases. The UCF was higher for single stage repair compared to two stage repairs.

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