

A Prospective Study Comparing the Role of the Waterproofing Layer in Hypospadias Repair Using the Asopa Single Stage and the Snodgrass Technique

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Abstract:

Background and Aims: In order to compare the outcomes of hypospadias repair, patients were divided into two groups: those who underwent Asopa single stage and those who underwent the Snodgrass technique. The complication rates between the two groups were assessed, particularly with regard to the occurrence of urethrocutaneous fistula.

Methods: A prospective study was conducted from October 2022 to March 2023 in the Department of Paediatric Surgery at Maulana Azad Medical College and the associated Lok Nayak Hospital in New Delhi. The study involved 18 cases of hypospadias.

Result: The majority of our cases (83.33%) in our study were younger than 8 years old. Mid penile hypospadias (50%), proximal (27.77%), and distal (22.22%) hypospadias were the most prevalent types. Of our cases, chordee was present in 66.66% of them. Penile torsion was present in 11.11% of the cases prior to surgery. When there was a large chordee, the Asopa technique was applied; when there was not, the Snodgrass technique was utilized. In 66.66% of the instances, the urethral plate was well-formed and grooved, shallow in 27.77%, and deformed in 5.55% of the cases. While 44.44% of cases lacked a water proofing layer, 55.55% of cases had the neourethra waterproofed. The group that did not have water proofing had superior cosmetic results (87.5%) than the group that did (70%) but there was a higher risk of metal stenosis and skin flap necrosis, which can result in the creation of urethrocutaneous fistulas.

Conclusion: Waterproofing reduces the likelihood of skin flap necrosis and meatal stenosis with unfavorable cosmetic outcomes.

Keywords: Hypospadias, Asopa single stage, Snodgrass technique, Urethrocutaneous fistula.

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Introduction

The issue of hypospadias has continually tested the imagination and inventiveness of surgeons since the first effort at its repair by the Alexandrian surgeons Heliodorus and Antyllus in the first century A.D. [1] Achieving a glans, meatus, and phallus that seem and function normally is the aim of contemporary hypospadias correction. [2] Complications are more common with hypospadias correction. Although one-stage repairs appear appealing and ideal, they have drawbacks and have a significant risk of complications. The long-term outcomes are equally unsatisfactory. [3]

Psychologically, the finished product's quality matters more than how many processes it took to

create because of its exceptional variety, applicability, simplicity, and superior outcomes.

Hypospadias in males is an association of three anomalies of penis:

1. An abnormal ventral opening of urethral meatus from ventral aspect of glans penis to the perineum.
2. An abnormal ventral curvature of penis (chordee).
3. An abnormal distribution of fore skin dorsal hood.

Not every situation calls for the use of second or third characters. It is typically linked to meatal stenosis, and the incidence of cryptorchidism in

male neonates is roughly 1 in 250. It is commonly known that the waterproofing barrier that exists between the skin and the urethra helps to prevent fistula complications following hypospadias surgery. Different tissues have been employed for this objective. [4]

The typical Buck's fascial layer from the dorsal prepuce and its mobilization to the ventral side is used by Bracka's repair [5] to cover the neourethra. The patient's degree of functional impairment varies based on the severity of hypospadias. While the hypospadiac meatus usually does not cause major obstruction to urine flow, it might bend the urine stream ventrally. In cases where the meatus is more proximal, the stream flows straight downhill or backward, producing urination, ad modumfeminarum, psychological issues, and the potential to impair fertility due to difficulties in semen delivery [6].

Based on waterproofing that is, hypospadias repair with a waterproofing layer or hypospadias repair without a waterproofing layer we split the patient into two groups. We employed two techniques in our study: the Asopa approach for the more proximal penile region and the Snodgrass technique for the distal and mid penile region. A note on complexity and outcome comparison was made. A 10- to 16-day hospital stay was followed by three- and six-month follow-ups.

Material and Method

The period of study was October 2022 to March 2023 in the Department of Pediatric Surgery, Maulana Azad Medical College and associated Lok

Nayak Hospital, New Delhi. Each child's name, age, height, weight, and address were noted when they were hospitalized two to three days before to surgery.

Table 1 shows the patient's age at presentation. The position of the meatus in the distal, mid, and proximal penile regions determined the classification of the hypospadias. Four patients have distal penile hypospadias, five have proximal penile hypospadias, and nine have midpenile hypospadias. Of the eighteen patients, twelve had considerable chordee and six did not; eleven had a well-formed urethral plate, five had shallow urethral plates, and two had malformed urethral plates.

Two surgical techniques were used: Asopa for proximal hypospadias and Snodgrass for distal and mid-penile hypospadias. Using a tourniquet allows for intraoperative hemostasis.

Both utilized urethral catheters and Polygalactin 6-0 suture material. By wrapping the tunica vaginalis pedicle with dorsal and ventral flaps, waterproofing was achieved.

The penis was covered with sufratullae and secured to the anterior abdominal wall using adhesive tape. Thus in 50% of the situations, we applied the Asopa technique and in 50%, Snodgrass. In 55.55% of cases, neourethra waterproofing was completed.

Results

Eighteen patients with hypospadias were admitted for the current investigation. 83.33% of our instances involved children under the age of eight.

Table 1: Age at Presentation

Age	No. of patients	Percentage
1-4	6	33.33%
4-6	5	27.77%
6-8	4	22.22%
8-15	3	16.66%

Middle hypospadias (50%), proximal (27.77%), and distal (22.22%) hypospadias were the most prevalent types. The study's meatus position in hypospadias is displayed in table no. (2).

Table 2: Type of Hypospadias

Position of meatus	No. of patients	Percentage
Distal penile	4	22.2%
Mid penile	9	50.0%
Proximal penile	5	27.77%

Chordee was present in 66.66% of our cases. 11.11% cases had penile torsion in pre-operative period.

Table 3: Operative Technique

Operative Techniques	With waterproofing	Without waterproofing	Total
Asopa Techniques	3	6	9 (50%)
Snodgrass Techniques	7	2	9 (50%)
Total	10 (55.55%)	8 (44.44%)	18

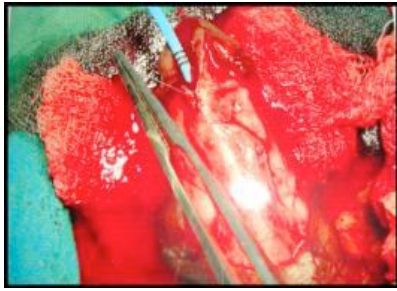


Figure 1: Tubularization Of Urethral Plate

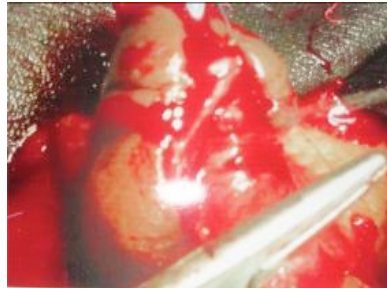


Figure 2: Water Proffing Of Neourethra Using Dorsal Dartos Flap



Figure 3: Skin Coverage

When there was a large chordee, the Asopa technique was applied; when there was not, the Snodgrass technique was utilized. The operational method is presented in Table No. 3. In 66.66% of the instances, the urethral plate was well-formed and grooved, shallow in 27.77%, and deformed in

5.55% of the cases. In 50% of the cases, we employed the Asopa approach, and in 50% of them, Snodgrass, depending on where the metal aperture was. While 44.44% of instances lacked a waterproofing layer, 55.55% of cases had the neourethra waterproofed.

Table 4: Cosmetic appearance

Cosmetic appearance	With waterproofing	Without waterproofing
Satisfactory	7	7
Poor	3	1



Figure 4: Final Appearance of Penis

While the group without waterproofing had a superior esthetic outcome (87.5%) than the group that underwent waterproofing (70%), there was a higher risk of meatal stenosis and skin flap necrosis, which can result in the creation of urethrocutaneous fistulas. Therefore, waterproofing reduces the possibility of skin flap necrosis and metal stenosis with unfavorable cosmetic

outcomes. The urethrocutaneous fistula and cosmetic outcome are displayed in Tables Nos. 4 and 5. In every case, penile edema was observed in the initial post-operative phase.

On the eighth post-op day, it vanishes. The group that did not have waterproofing had metal stenosis. Incidence was 3 out of 18 cases, or 16.6%.

Table 5: Cosmetic appearance

Urethro cutaneous fistula	With waterproofing	Without waterproofing
Snodgrass Technique	0	1
Asopa Technique	0	2

Waterproofing prevents metal stenosis by using a pedicle flap that is adequately vascularized. Two of the cases one from each group had a narrow urine stream, which was indicative of metal stenosis. Three of the cases had a double stream, which was indicative of a urethrocutaneous fistula. According

to published literature, our study had a higher complication rate. In hypospadias surgery, precise technique, delicate tissue manipulation, fine dissection, and minimal tissue trauma are essential. Furthermore, there is insufficient data from the study and a small number of patients to make any

firm judgments about the effectiveness or failure of these procedures. However, our research indicates that waterproofing layers are crucial in preventing urethrocutaneous fistulas. Therefore, the waterproofing layer in hypospadias correction avoids further problems.

Discussion

Two connected trends have emerged in the surgical care of hypospadias in recent years: first, a shift toward single rather than staged correction, and second, techniques aimed at achieving both functionally satisfactory and aesthetically pleasing outcomes. [7]

Repairing hypospadias is more likely to have complications. Following hypospadias surgery, the most frequent complication is urethrocutaneous fistula. Contrasting suture lines are a known risk factor for the development of fistulas. [8] Various methods have been developed to address this issue, and the search for the perfect method continues.

Placing a tissue layer between the neourethra and the skin is the most popular procedure among these. [9] This process, which has been appropriately termed waterproofing, involves the incorporation of many tissues. Subcutaneous tissue, Dartos fascia, Dartos muscle from the scrotum, and tunica vaginalis from the scrotum are used in typical waterproofing treatments. [13] As in typical Bracka's repair, deepithelized skin and Buck's fascia from the dorsal prepuce. [5]

Each of these methods has intrinsic drawbacks, such as the need for several incisions, extensive dissection, a higher risk of skin necrosis, longer recovery times, and higher rates of morbidity. To waterproof the neourethra, we used the tunica vaginalis flap, the ventral dartos flap, and the dorsal dartos flap. The majority of patients (33.33%) in our sample of 18 patients presented between the ages of 1-4, while 27.77% did so between 4-6. Of the patients, 22.22% were between the ages of 6 and 8, while 16.66% presented between the ages of 8-15.

The most prevalent age of presentation was between one and four years old since pediatricians saw this age group and recommended that they be evaluated for suitable surgery at this time. In our investigation, the most common types of penile hypospadias were distal penile (22.2%), proximal (27.77%), and mid (50%). Improvements in pediatric anesthesia and microsurgery enable the surgeon to do hypospadias treatment on far younger patients without taking on more risk.

It was advised to undergo surgery for hypospadias treatment at a younger age due to a better understanding of how different psychosocial factors interact in children who have hypospadias.

These consist of body image, genital awareness, sexual orientation, and separation anxiety.² After analyzing these factors, Schultz and colleagues recommended repair between the ages of 8 to 14 months. [15]

The recommended age range for hypospadias correction these days is 3 to 12 months. It is thought that the penis at this age is big enough to have the same success as it did when it was two to five years old, which used to be common. [8] Additionally, surgery at this time predates the development of the ideal parental-child relationship and genital awareness (18 months). Early correction also reduces parental shame and anxiety. [2] The majority of the 18 hypospadias cases (83.33%) in our study involved patients who were younger than 8 years old.

In a study of 509 individuals, Asopa et al. (1998) found that 71.11% of the cases were younger than 10 years old. These results are consistent with our observations. According to Duckett (1996), 20% of his patients had posterior hypospadias, 30% had intermediate hypospadias, and 50% had anterior hypospadias. Standoli recorded 80% anterior, 14% middle, and 6% posterior hypospadias, but Tuskewinsky reported 70% anterior, 16% middle, and 14% posterior meatus.

There were 22.22% cases of anterior, 50% of middle, and 27.77% of posterior hypospadias in our study group. Because patients with coronal and granular hypospadias were not included in our study, the true incidence of each kind of hypospadias is not shown in our data.

Conclusion

We used the Asopa approach in cases with considerable chordee and the Snodgrass technique in cases without significant chordee in our prospective research of 18 cases of hypospadias. Neourethra waterproofing was completed in 55.55% of cases, while 44.44% of cases lacked a waterproofing layer. According to this study, waterproofing enhances surgical outcomes by lowering the risk of urethrocutaneous fistula.

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