



ORIGINAL ARTICLE

Clinical efficacy of transverse preputial island flap urethroplasty for single-stage hypospadias repair in Children Hospital Faisalabad” A Retrospective Study.

Imran Qadir¹, Sadaqat Ali², Samreen Jamil³, Haji Muhammad⁴

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ABSTRACT... Objective: To summarize the clinical outcomes of single stage hypospadias surgery with preputial-island flap method in the Children Hospital, Faisalabad. **Study Design:** Retrospective Study. **Setting:** Department of Paediatric Urology, Children Hospital, Faisalabad. **Period:** March 2018 to March 2023. **Material & Methods:** First of all, approval of study from the Hospital Ethical Review Committee was taken for research work. For last five years, all patients of hypospadias repair were admitted in the ward via OPD of Pediatric Urology Department of Children Hospital, Faisalabad. According to inclusion and exclusion criteria, these patients were considered to be included in study. After analyzing the patients with history and physical examination, the diagnosis was confirmed and after the informed consent of surgery and consent of data for research purposes the patients were put in the research work. **Results:** There were one hundred and fifteen patients (n=115), who were operated using single stage hypospadias repair with method where we used dorsal prepuce in transverse manner as flap known as preputial-island-flap method during the study period time. The complication of surgery rate was found 48.7% in the study. There were five patients (4.34%) suffering from mild infection. Six patients (5.2%) had disruption of repair; secondary surgical correction was successful in all of them. Ten patients (6.7%) suffered necrosis and slugging of new urethral tube followed by disruption of repair. Urethro-cutaneous fistula was observed in sixteen patients (13-9%), it was single in eleven patients and the rest of five had more than one fistula. Four patients needed fistula repair, rest of the eleven healed with self-urethral dilatation, seven patients (6%) had meatal stenosis, while four patients (3.5%) had urethral stricture. **Conclusion:** Single staged hypospadias repair where dorsal prepuce in transverse manner were taken as flap known as preputial-island-flap is also an acceptable choice for surgery. Results of study showed transverse preputial-island-flap technique is an acceptable option. Because the vascularity of tube is intact and good, secondly results are better, thirdly this technique has lower rate of complications, fourthly we completed in single stage which was the time saving.

Key words: Hypospadias, Preputial-island Flap, Urethroplasty.

INTRODUCTION

In the list of congenital anomalies, hypospadias is considered as one of the commonest congenital anomalies.¹ Proximal hypospadias is defined when meatus is opened up in the proximal to the scrotum, in the centrum of penis or near the perineum.² Mid-penile hypospadias is not an acceptable condition, where surgery is mandatory in multiple and proximal hypospadias. Proximal hypospadias is managed with difficult techniques, where high complications occur in most of these techniques. With the passage of time surgical improvements took place, and proximal

hypospadias can be managed with single stage methods now³, while high rate of complications is still a great challenge for the pediatric urologists.⁴ We can categorize the surgical repair into single-staged hypospadias repair and two-staged hypospadias repairs, while findings of Long CJ et al research found that single-staged surgery had higher level of complication than two-staged surgical repair.⁵ However, in recent research works, we found higher complications rate in two-staged surgery of hypospadias repair, which reaches to 30-68% while single-staged surgical repair has lower complication rate. Conclusively

1. MD, FCPS, Assistant Professor Paediatric Urology, Children Hospital Faisalabad.
2. FCPS, Assistant Professor Pediatric Surgery, Children Hospital, Faisalabad.
3. FCPS, Assistant Professor Pediatric Surgery, Allied Hospital, Faisalabad.
4. FCPS, Admin Registrar Pediatric Urology, Children Hospital, Faisalabad.

Correspondence Address:
Dr. Imran Qadir
Department of Paediatric Urology
Children Hospital Faisalabad.
drimranqadir@yahoo.com

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single- staged surgical approach can reduce the number of surgical procedures, and it leads to decrease of patient's misery.^{6,7} In this study we analyzed the clinical data of the patients who underwent hypospadias repair where dorsal prepuce in transverse manner was taken as flap known as preputial-island-flap urethroplasty for the single-staged method of hypospadias repair for the last five years in the Children Hospital, Faisalabad.

Objective

This study was designed to summarize the clinical outcomes for the repair of hypospadias in single-stage using the technique named transverse preputial-island-flap urethroplasty in Children Hospital Faisalabad.

MATERIAL & METHODS

Our research study was conducted after the approval of ethical review committee (Reg. No.136(27/6/22) in children hospital and institute of child health Faisalabad. Where we collected the data of last five years of hypospadias surgery done in single setting using the surgical technique named Transverse preputial-island-flap urethroplasty. The data of the study was taken from the Paediatric Urology Department Children Hospital Faisalabad, where informed consent of the parents or guardians were already taken for the surgical procedure and the data of study which was collected for research purpose.

There were total of one hundred and fifteen children who underwent single staged surgery with the surgical procedure named transversely taken preputial-island-flap urethroplasty. Inclusion criteria of the patients were children under 15 years of age diagnosed with hypospadias categorized as distal-penile level, mid-penile level and proximal-penile level with or without chordee. While hypospadias of perineal level and scrotal level, crippled hypospadias, complex urogenital malformations and hermaphroditism were excluded from study. All operations included in study were performed by the same surgical team of the department children hospital Faisalabad. During the procedure an artificial erection test was performed with the help of injection of normal

saline in the penis with tourniquet where chordee of penis was checked and corrected where required. A transverse island flap of the prepuce specifically from the inner layer was taken. Length of flap was equal to the distance between the hypospadias orifice and glans tip, which was usually 12-20 mm wide. Flap was raised with its axial vascular pedicle. After adequate mobilization, this flap was tabularized around the foley catheter which was suitable to the patient's urethral diameter. We used suture material Polyglactin 6/0 (Vicryl) to form the tube. The newly formed tube as urethra was moved to ventrally. This new tube was anastomosed to the native urethral opening proximally and at the proposed glans site distally followed by glanuloplasty. Foley catheter was put for drainage purpose as well as for stent purpose.

Foley catheter was anchored distally to the glans with the black silk suture. The residual dorsal layer of prepuce was moved ventrally to cover the tube with the skin. First dressing of the surgical site was replaced at fifth post-operative day followed by daily dressing. At fifth post-operative day viability and integrity of the repair was assessed. Acute postoperative complications were detected and documented (i.e., bleeding, hematoma and edema), on daily basis. The catheter was kept in situ till 12th post-operative day. All the patients were kept on regular follow-up in outpatient department of the paediatric urology children hospital Faisalabad. First evaluation after discharge was proceeded after seven days of discharge followed by at 30th day then at 3 months and then at 6 months. The patients suffering from meatal stenosis and urethral stricture were given Urethral dilatations. We performed repair of urethra-cutaneous fistula for patients having persistent urethra-cutaneous fistula even after 6 months of surgery.

We evaluated the statistical differences in the detection rates of postoperative incidences that patients need reoperation, urethra-cutaneous fistula, Urethral stricture, urethral diverticulum, cosmetic appearance of the penis by family members' satisfaction especially for the meatus and glans cosmetic appearance. All data was entered and processed in SPSS v- 10. Where the

Numerical variables i.e., age, duration of hospital stay will be described with mean ± standard deviation and compared by using independent sample “t” test between both groups.

And Nominal variable i.e., 1) patients underwent reoperation 2) urinary fistula, 3) Urethral stricture, 4) urethral diverticulum 5) family members’ satisfaction with the cosmetic appearance of the penis, will be described as frequencies and percentages and compared by Chi Square test between both groups. P-value of <0.05 will be taken as significant.

RESULTS

There were one hundred and fifteen (n=115) patients who were operated for single stage hypospadias surgery via transverse preputial island flap method during the study period time. Chordee of various degree was found in the study population. The age of the patients ranged from one year to 14 years (mean age was 6.7 years). Most of the patients were younger than 6 years of age (n=63, 55%). The age distribution is given in the Figure-1.

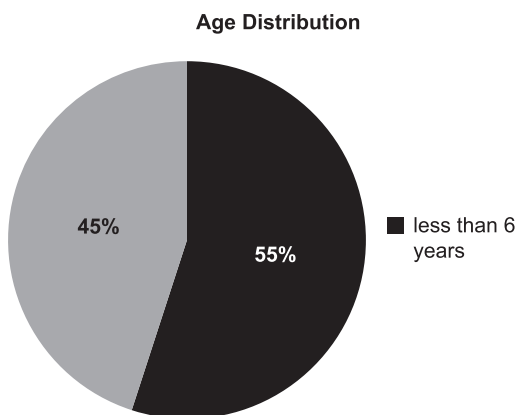


Figure-1: Age Distribution

The urinary meatal opening was distributed as a) sub-coronal or distal penile in 65 cases (56%), b) mid-penile in 42 cases (36%), and c) penoscrotal in 8 cases (7%) described in Figure-2. The repair was successful and uneventful in 58.27 % (n 67) patient having normal urinary stream without any complication.

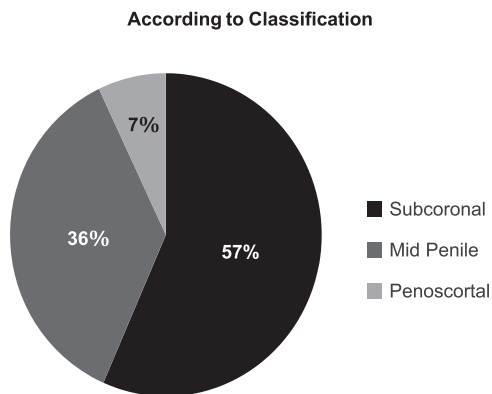


Figure-2: Type of Hypospadias

Overall complication rate in our study was documented in 48 patients (41.73 %). We found mild infection in five patients (4.34 %), infection was managed with antibiotics therapy and antiseptic dressings. Disruption of tube was observed in six patients (5.2%). Ten patients (6.7%) suffered necrosis and slugging of new urethral tube followed by disruption of repair which were managed with debridement and daily dressing. Urethro-cutaneous fistula was observed in sixteen patients (13.9%), It was single fistula in eleven patients while in six patients there were more than one fistula. Four patients needed fistula repair, rest of the eleven healed with self-urethral dilatation. Seven patients (6%) had meatal stenosis, while four patients (3.5%) suffered urethral stricture. Meatal stenosis and urethral stricture were managed well with regular urethral dilation. All complications are summarized in Figure-3. Family members’ satisfaction with the cosmetic appearance of the penis was documented to be 76 (66%).

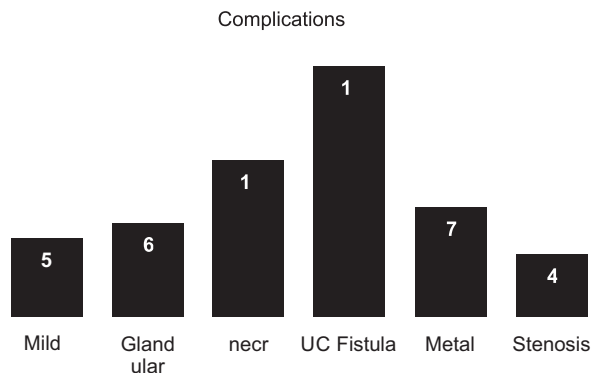


Figure-3: Complications of urethroplasty

DISCUSSION

No single procedure is better than another when treating hypospadias, especially in complex cases of hypospadias. As a result, the reconstruction should take into account the severity of the chordee, the condition of the urethral plate, and the condition of the penile skin. Preputial-island-flap is a good alternative for proximal hypospadias in terms of neourethral development and chordee repair in a single-stage setting.⁸

Because there are so many complications with hypospadias correction surgeries, paediatric urologists face several challenges to correct it. Therefore, the single setting, two-layered repair has demonstrated enhanced neourethral healing and decreased the risk of ischemia necrosis.⁹

Hayashi¹⁰ et al observed only one fistula out of thirteen patients who had undergone two-layered hypospadias repair. Where the formed neourethra was covered with an additional layer of tissue taken from corpus spongiosum. Shahin⁸ et al also prevail his study's results which are match with our study where they reported the complication rate of only 20.1% (29 of 144). In the study conducted by Ahmed, 8 incidences of meatal stenosis (8.5%) were documented. The causes of stenosis were attributed to technical restrictions that resulted in a restricted meatal lumen and overly tight glandular level stiches. These issues were resolved, and the final 19 patients did not exhibit any significant problems.¹¹

Early calibration and self-dilatation postoperatively help treatment of meatal stenosis.¹² Although there is a significant incidence of meatal stenosis, it can be treated by self-dilation, and routine dilations are recommended for months. For meatal stenosis, no patient needed surgery advised by Ahmed.¹¹ Another complication is urethral stricture in transverse preputial-island-flap urethroplasty with reported incidence in different studies of 6-22%.^{13,14,15} Sticture occurred in 4 patients (3.5%) in our series. They were single and occurred either at junction of proximal urethra or at neourethra. All responded to serial dilatation plan.

The most crucial question to examine is why some urethroplasty surgeries provide effective results while others do not. We may consider patient variables, surgical expertise, and techniques, but none can definitively identify a specific method as being preferable. Although there were many initial difficulties, patients responded well to conservative therapy, and in our final twenty patients, there was a noticeable improvement.

In our series, we also took notice of the pattern of learning that comes with time and experience. To support our conclusion, a significantly bigger patient pool and a longer study period are needed in the future.

CONCLUSION

Single staged hypospadias repair where dorsal prepuce in transverse manner was taken as flap known as preputial-island-flap is also an acceptable choice for surgery. Results of study shows that transverse preputial-island-flap technique is an acceptable option. Because the vascularity of tube is intact and good, secondly results are better, thirdly this technique has lower rate of complications, fourthly we completed in single stage which was the time saving.




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AUTHORSHIP AND CONTRIBUTION DECLARATION

No.	Author(s) Full Name	Contribution to the paper	Author(s) Signature
1	Imran Qadir	Protocol/project conception and design.	
2	Sadaqat Ali	Data acquisition.	
3	Samreen Jamil	Manuscript writing proof reading.	
4	Haji Muhammad	Analysis and data interpretation.	