



The Cosmetic Outcome of Distal Penile Hypospadias Repair Using Stitch-by-stitch Glanuloplasty versus TIP: A Non-randomized Retrospective Study

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Abstract

Objectives: This study aims to assess the cosmetic outcomes of stitch-by-stitch (SBS) glanuloplasty in comparison to the tubularized incised plate (TIP) technique for the treatment of hypospadias.

Methods: We conducted a retrospective analysis of patient records covering the period from March 2021 to March 2022. In total, 87 boys underwent hypospadias repair at our institution during this timeframe. The study focused on a subgroup of 40 children aged one to three years, among whom 20 received TIP repair, while the other 20 underwent SBS glanuloplasty onlay repair. The choice of surgical technique was determined by the surgeon's discretion, glans morphology, and the width of the urethral plate. All patients were subject to postoperative follow-ups at one and three weeks and then at three months to evaluate the cosmetic outcomes and postoperative complications.

Results: The mean age of patients in the SBS group was 24.55 ± 5.74 months, compared to 25.65 ± 7.34 months in the TIP group. Parental satisfaction in the SBS group reached 85%, while it was 75% in the TIP group ($p=0.659$). Furthermore, both groups exhibited similar satisfaction rates among other pediatric surgeons (80%) and nurses (80%). Overall satisfaction rates were marginally higher in the SBS group (85%) compared to the TIP group (80%), with no statistically significant difference observed ($p=0.666$). The incidence of complications was 25% in the SBS group and 20% in the TIP group.

Conclusion: this study underscores that both SBS and TIP techniques offer comparable levels of satisfaction among patients, nurses, and surgeons. Furthermore, the complication rates between the two techniques were similar.

Keywords : TIP, Flaps, Glansplasty, hypospadias

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Introduction

Hypospadias stands as the second most prevalent congenital anomaly among males, affecting approximately one in every 300 newborns ⁽¹⁾ The most

common form of hypospadias is the distal type, with more than 70% of patients having their urethral openings situated at the coronal positions ⁽²⁾ The

primary goal of hypospadias repair is the restoration of both normal form and function. A desirable outcome is characterized by a straightened penis, devoid of any deviations, with a wide, vertically oriented slit-like external meatus, featuring smooth edges located at the tip of a conical glans.⁽³⁾

Presently, the majority of distal and midshaft hypospadias cases are managed using the tubularized incised plate (TIP) technique⁽⁴⁾ However, the widespread adoption of TIP urethroplasty encounters significant challenges, primarily stemming from the presence of narrow urethral plates, flat glans, and underdeveloped urethras. Consequently, this approach is associated with a higher incidence of complications such as urethrocutaneous fistulas (0–33%) and meatal stenosis, necessitating regular dilatation in cases with a narrow, underdeveloped urethral plate and narrow glans wings.⁽⁵⁾

In response to these challenges, the stitch-by-stitch technique was developed by Elmoghazy et al. with the aim of achieving glans closure without tension. This method seeks to provide a cosmetically pleasing outcome, characterized by a conical glans with a wide, vertically oriented external urethral meatus at the glans tip. In their study, Elmoghazy et al. reported an overall satisfaction rate of 87% among patients older than six years and 84% among patients younger than six years.⁽⁶⁾ However, it's

important to note that this technique has not yet undergone external validation. Consequently, the objective of the present study is to assess the cosmetic outcomes of stitch-by-stitch glanuloplasty in comparison to the TIP technique.

Patients and Methods

We conducted a retrospective analysis of patient records covering the period from March 2021 to March 2022, including 87 boys who underwent hypospadias repair at our institution during this timeframe. Distal penile hypospadias (DPH) was classified based on the initial meatal position at the commencement of the urethroplasty. Our study specifically focused on children aged between one and three years, resulting in a population of 40 patients. Among these, 20 received the tubularized incised plate (TIP) repair, while the remaining 20 underwent stitch-by-stitch (SBS) glanuloplasty onlay repair. The choice of surgical technique was made in accordance with the surgeon's clinical judgment, considerations related to the glans morphology, and assessment of the width of the urethral plate. If the urethral plate measured greater than 8 mm, the child was selected for the TIP procedure, whereas a urethral plate measuring less than 8 mm led to the adoption of the stitch-by-stitch technique.



Fig. 1; shows male child 3 years with wide healthy urethral plate and managed by TIP.

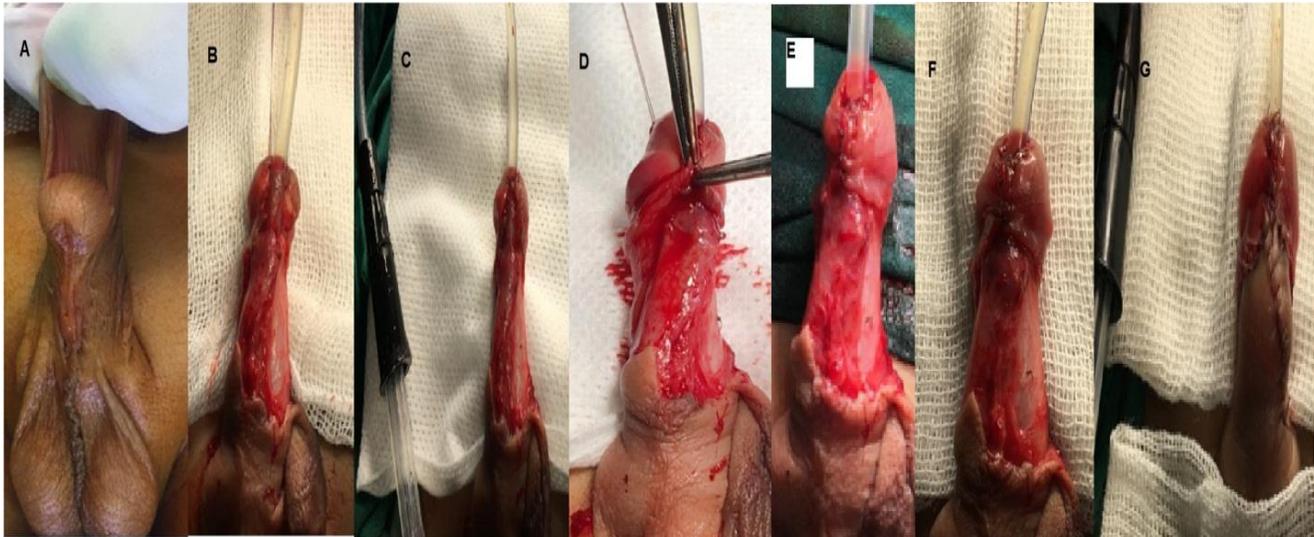


Fig. 2; shows male child 3.5 years with hypoplastic narrow urethral plate and managed by SBS onlay urethroplasty

Exclusion criteria encompassed patients who had undergone prior correction with alternative techniques, those presenting with proximal penile or mid-shaft defects, raised serum creatinine levels, or coagulopathy. Ethical approval for this study was obtained from the Medical Research Ethics Committee of our Faculty.

Postoperatively, all patients were subjected to follow-up assessments at one and three weeks, followed by a three-month evaluation period. These assessments aimed to characterize the shape of the glans, assess cosmetic outcomes, and identify any postoperative complications, including stenosis, infection, and suture disruption. The cosmetic outcome evaluation involved input from another pediatric surgeon, parents, and a registered nurse.

Data were summarized as mean, standard deviation or frequency (%). We conducted comparative analysis for continuous variables using the independent t-test. For categorical variables, we employed both the Chi-square test and Fisher exact test. Furthermore, we applied binary logistic regression analysis to uncover potential predictors of satisfactory cosmetic outcomes, considering a statistical significance level at a P-value of <0.05. We utilized the SPSS software, version 22, to collect, code, and analyze our data.

Results

The mean age of the patients in the SBS group was 24.55 ± 5.74 months, and 25.65 ± 7.34 months in the TIP group, with a statistically insignificant difference ($p=0.601$). The mean urethral plate width was 5.60 ± 1.10 mm and 9.60 ± 1.05 mm in SBS and TIP groups ($P<0.001$), respectively.

In the SBS group, parents' satisfaction rate was (85%), compared to (75%) in the TIP group ($P=0.659$). On the other hand, both groups showed similar rates in terms of other pediatric surgeon satisfaction (80%) and nurse satisfaction (80%). The overall satisfaction rate was slightly higher in the SBS group compared to the TIP group (85% vs. 80%), respectively, with a statistically insignificant difference ($P=0.666$) (Table 1).

Regarding postoperative complications (Table 2), the rate was (25%) and (20%) in the SBS and TIP groups, respectively, with a statistically insignificant difference ($p=0.705$). The reported complications among the SBS group were meatal retraction ($n=2$), complete failure and prolapse flap ($n=2$), infection ($n=1$), and fistula ($n=1$). In the TIP group, fistula ($n=2$), complete failure ($n=2$), meatal stenosis ($n=1$), infection ($n=1$), and urethral stricture ($n=1$) were reported.

Table 1: Satisfaction

| Satisfaction | | SBS | TIP | P-value |
|----------------------|-----|----------|----------|---------|
| Parents | No | 3 (15%) | 5 (25%) | 0.659 |
| | Yes | 17 (85%) | 15 (75%) | |
| Nurses | No | 4 (20%) | 4 (20%) | 1.00 |
| | Yes | 16 (80%) | 16 (80%) | |
| Other Surgeons | No | 4 (20%) | 4 (20%) | 1.00 |
| | Yes | 16 (80%) | 16 (80%) | |
| Overall satisfaction | | 17 (85%) | 16 (80%) | 0.666 |

Table 2: Complications

| Complications | SBS | TIP | P-value |
|--------------------|---------|---------|---------|
| Rate | 5 (25%) | 4 (20%) | 0.705 |
| Meatal retraction | 2 | 0 | - |
| Meatal stenosis | 0 | 1 | |
| Complete failure | 2 | 2 | |
| Prolapse flap | 2 | 0 | |
| Fistula | 1 | 2 | |
| Urethral stricture | 0 | 1 | |
| Infection | 1 | 1 | |

Discussion

Hypospadias presents a complex challenge in terms of surgical management, and there is no universally accepted "best" surgical approach. The choice of method depends on a multitude of factors, including the surgeon's preference, available tissue, characteristics of the urethral plate, and surgical expertise. ⁽⁷⁾ The tubularized incised plate (TIP) urethroplasty emerged as a significant milestone in the treatment of hypospadias. It has become the standard technique for both distal and proximal hypospadias repair, owing to its simplicity, efficiency, and ability to yield aesthetically pleasing results, often featuring a vertically oriented meatus, which is superior to those achieved with onlay flap procedures. ⁽⁸⁾ However, despite its advantages, TIP urethroplasty is not without limitations. It is associated with a higher incidence of complications, notably urethrocutaneous fistula and meatal stenosis, which often require regular urethral dilatation. These complications are more prevalent in cases with flat glans and narrow urethral plates. ⁽⁹⁾ In recent years, the importance of the urethral plate characteristics has been emphasized as a significant factor influencing the outcomes of TIP procedures. Patients with narrow, hypoplastic, and flat urethral plates are more susceptible to complications like stenosis and fistula, even with the use of deep

urethral incisions and plate tubularization. A urethral plate width of at least 8 mm has been deemed critical for the success of the TIP procedure. ⁽¹⁰⁾

To address these challenges, Elmoghazy et al. introduced the stitch-by-stitch (SBS) technique for managing hypospadias. What sets this technique apart is its inclusivity; it does not exclude patients based on urethral plate width or gland size. Instead, it aims to create a V-shaped meatus while maintaining a high level of patient satisfaction (87% among patients above six years and 84% among those under six years). Importantly, the complication rate for SBS was 8.5% across all patients, and notably, there were no reported cases of meatal stenosis or retraction. ⁽⁶⁾

This study sought to compare the cosmetic outcomes of the TIP and SBS techniques using both subjective and objective measures. The findings revealed that both methods yielded comparable satisfaction rates among parents, registered nurses, and other pediatric surgeons. Moreover, the study employed the HOSE score. ⁽¹¹⁾ excluding the item related to curvature during erection (as all patients were children), and found no significant difference between the two groups, suggesting that SBS is not inferior to the TIP technique in terms of cosmetic outcomes.

Importantly, this study contributes to the body of knowledge by comparing the cosmetic results of the recently introduced SBS technique with the more established TIP technique. However, it is essential to acknowledge the study's limitations, including its small sample size, single-center design, and retrospective nature. Additionally, the study did not assess the sexual functioning of the participants due to the relatively short follow-up period.

In conclusion, this study underscores that both SBS and TIP techniques offer comparable levels of satisfaction among patients, nurses, and surgeons. Furthermore, the complication rates between the two techniques were similar. This information can assist clinicians in making informed decisions when choosing the appropriate surgical approach for treating hypospadias, taking into account the individual patient's characteristics and needs.

References

1. van der Horst HJR, de Wall, LL. Hypospadias, all there is to know. *Eur J Pediatr*. 2017; 176:435–441.
2. Halaseh SA, Halaseh S, Ashour M . Hypospadias: A Comprehensive Review Including Its Embryology, Etiology and Surgical Techniques. *Cureus*.2022. 14(7):e27544.
3. Baldini G, Bagry H, Aprikian A, et al. Postoperative Urinary Retention: Anesthetic and Perioperative Considerations. *Anesthesiology*. 2009; 110:1139–1157.
4. Braga LHP, Lorenzo AJ, Salle JLP. Tubularized incised plate urethroplasty for distal hypospadias: A literature review. *Indian J Urol*. 2008; 24:219–225.
5. Abbas TO, Ali M. Urethral Meatus and Glanular Closure Line: Normal Biometrics and Clinical Significance. *Urol J*. 2018; 15:277–279.
6. Elmoghazy H, Saber M, Mamdoh A, et al.. Cosmetic and functional outcome for the use of stitch by stitch technique in hypospadias surgery; results of 235 patients. *J Pediatr Urol*. 2020; 16:436.e1-436.e6.
7. Rady M, Abdalla M, Abdelrahman M, Mohamed A. Outcomes of Snodgrass (TIP) versus Slit Like Adjusted Mathieu (SLAM) in distal penile hypospadias repair in pediatrics. *Minia J Med Res*. 2022; 33:103–110.
8. Gama M, Abitew B, Abebe K.. Clinical Profiles and Surgical Outcome of Hypospadias Repair at a Teaching Hospital in Ethiopia. *Ethiop J Health Sci*. 2022; 32:613–622.
9. Abdelhalim KM, Abdelwahab HA, Abdelgawad E, et al. Predictors of successful outcome of tubularized incised plate for primary distal hypospadias repair. *African J Urol*. 2021; 27:164.
10. Eassa W, Jednak R, Capolicchio JP, et al . Risk factors for re-operation following tubularized incised plate urethroplasty: a comprehensive analysis. *Urology*. 2011; 77:716–720.
11. Andersson M, Sjöström S, Doroszkiewicz M, et al. Urological results and patient satisfaction in adolescents after surgery for proximal hypospadias in childhood. *J Pediatr Urol*. 2020; 16:660.e1-660.e8.