

## Limited Dorsal Slit Preputialplasty for Management of Phimosis in Children

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Received: January 07, 2019;  
Initial review: June 06, 2019;  
Accepted: September 19, 2019.

**Objective:** To evaluate the functional and cosmetic result of limited dorsal slit preputialplasty for surgical management of phimosis in children. **Methods:** This is a prospective cohort study (Jan 2010 to Dec 2019) of 246 children (age >5 y) who were unable to retract the foreskin and were symptomatic. **Results:** No intraoperative complications were encountered. Preputial edema was the most common ( $n=45$ , 18.2%) immediate postoperative occurrence. At one year follow-up, a total cosmetic score of 6 (considered optimal) was seen in 203 (91%) patients. A score of 5 was observed in 13 (5.9%) and the remaining 7 (3.1%) had a score of less than 4. All pubertal children, except one, could retract prepuce freely without discomfort. **Conclusion:** This preputialplasty provides satisfactory cosmetic and functional result in phimosis, and is an acceptable alternative to circumcision.

**Keywords:** Circumcision, Surgery, Treatment.

Physiologic phimosis is common in newborn males due to flimsy adhesions between glans and prepuce. The adhesion to glans and prepuce separates over time reducing to 50% at the age of two years, 8% by seven years, and 1% by eighteen years of age. Poor hygiene and recurrent balanoposthitis lead to the development of true phimosis [1]. In children with phimosis, preputialplasty represents a surgical alternative to circumcision, which is associated with many functional and physiologic problems [2-4]. Complications like hemorrhage, edema, infection, meatal stenosis, urethral fistulae, scars, penile curvature, shortness of shaft skin, and partial or total penile loss have been reported after circumcision [5]. Preputialplasty broadens the preputial meatus to permit its simple withdrawal and better cleanliness while maintaining the typical cosmetic appearance of the penis. This study aimed to evaluate the short- and long-term functional and cosmetic results, and the patients' and parents' acceptance of limited dorsal slit preputialplasty.

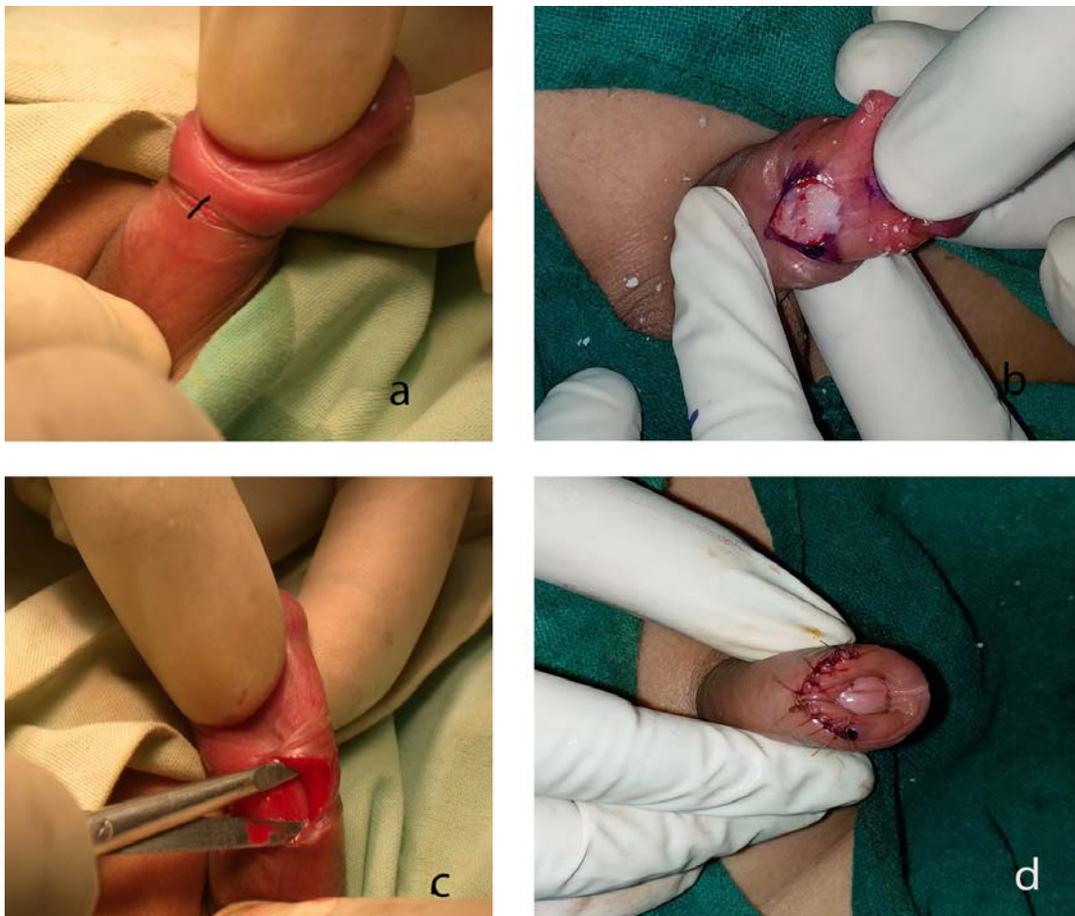
### METHODS

This prospective observational study was carried out over a period of eight years (January 2010 to December 2018) in a tertiary referral center. Institutional review board and ethical committee approval was obtained. Parental preference and consent for preputialplasty was obtained in these patients after discussing the pros and cons of both circumcision and preputialplasty. We excluded patients with balanitis xerotica obliterans or those with severely scarred fibrotic prepuce. Participants

included children older than five years with pathological phimosis complicated with ballooning, straining, recurrent balanoposthitis, painful erections, recurrent urinary tract infection (UTI), urinary retention, preputial stenosis resistant to 3 months trial of adhesiolysis and retraction by parents, minimally scarred prepuce or redundant prepuce.

All children underwent limited preputialplasty, which is a modification of the classical dorsal slit technique. The foreskin is mobilized, dividing glandular adhesions, and retracted to show the tight constricting band (**Fig. 1a**). The incision is given longitudinally along the dorsum of the penis only over the band till the bucks' fascia (**Fig. 1b**). Space is created by undermining into both lateral sides for 4-6 mm (**Fig. 1c**) and repeat incision made on the ring laterally through the same incision. The incision is closed transversely with absorbable 5/0 vicryl rapid sutures (**Fig. 1d**). This widens the tube of the prepuce and allows its free movement. All procedures were conducted as day-care surgeries under sedation and penile block by the author.

All children underwent follow-up evaluation at 1, 3 and 4 weeks, and 3 and 6 months. The outcome was assessed in terms of preputial edema, bleeding, retention of urine, discomfort in wearing pants, infection, paraphimosis, retractibility, recurrence, sexual pleasure (if applicable) and parental satisfaction for cosmesis. At 1 year follow-up, the modified Hollander wound evaluation scoring was done [6,7]. Wound clinical examination was based on absence of step-off, contour irregularities,



**FIG. 1** Steps of preputialplasty: (a) showing tight constricting band after full prepuce retraction; (b) showing incision over the band; (c) showing the creation of lateral space; and (d) at the completion of preputialplasty.

wound margin separation >2 mm, edge quality, distortion, and overall cosmetic appearance. Each of these categories was graded on a 0 or 1 point scale. A total cosmetic score was derived from the addition of the six categorical variables. A score of 6 was considered the best, while lower scores suggested suboptimal results. All patients were evaluated for the outcome by the author and one independent observer.

## RESULTS

A cohort of 246 boys was studied with mean (SD) age of 9.87 (1.87) years. The operating time ranged between 20 and 35 minutes. All children had presented with problems consequent to pathological phimosis (**Table I**). No intraoperative complications were encountered. The dorsal slit measured between 4 to 7 mm. There was no postoperative distress, postoperative bleeding or any problems in passing urine. There was no need for the overnight stay, and none required catheterization for urinary retention. All the children after operation were

able to wear pants immediately without any discomfort. Preputial edema was the most common immediate postoperative event encountered in 45 (18.2%) patients, which subsided in 3 to 5 days in all except four (1.7%) patients with long redundant prepuce who required 10-14 days for preputial edema to subside. Complaints of burning during micturition ( $n=6$ , 2.5%) and straining ( $n=5$ ,

**TABLE I** PRESENTATION OF PATHOLOGICAL PHIMOSIS IN CHILDREN OLDER THAN 5 YEARS ( $N=246$ )

Clinical presentation	n (%)
Ballooning and straining	179 (72.8)
Recurrent UTI	21 (8.6)
Recurrent posthitis	17 (6.9)
Long prepuce	11 (4.5)
Minimally scarred prepuce	9 (3.7)
Painful erection	7 (2.9)
Urinary retention	2 (0.9)

#### WHAT THIS STUDY ADDS?

- Limited dorsal slit preputialplasty is safe, day care surgical procedure with low complication rate.
- It preserves the prepuce and has satisfactory cosmetic and functional outcome.

2%) were seen in the first postoperative week. Bluish discoloration suggesting hematoma was noticed in two patients which resolved within a week. Mild inflammation also occurred in 6 (2.5%) patients. No patient had wound infection or disruption. Wound healing was satisfactory in all the patients at one month follow-up. Parents of the patients were comfortable in learning and performing preputial retraction and reposition at 7<sup>th</sup> day postoperative follow-up. The majority (178, 72.3%) could mobilize foreskin freely without discomfort from the second week, or within 3 weeks (176, 92.7%). Two patients had paraphimosis following preputialplasty. Twenty-three patients were lost to follow-up between the 3<sup>rd</sup> and the 6<sup>th</sup> months after surgery.

At 3-month follow-up, no patient had a recurrence. Minimal adhesions seen in 18 (7.5%) patients were separated, using topical lignocaine. Four patients (1.8%) had partial narrowing of the foreskin at 6 months follow-up. The final cosmetic scoring was done at one year follow-up. A total cosmetic score of 6 (considered optimal) was seen in 203 (91%) patients. A score of 5 was seen in 13 (5.9%), and the remaining 7 (3.1%) had a score of less than 4. Long-term postoperative complications in terms of recurrence of phimosis were seen in 7 (3.1%) patients. One adolescent had problems pulling back the foreskin during erection. None of our patients required a redo procedure and none of the parents requested revision circumcision over a maximum of 8 years follow-up.

#### DISCUSSION

In this study, we observed that preputialplasty provided satisfactory short-term and long-term results in children and adolescents with symptomatic phimosis. Several other units have performed the dorsal slit preputialplasty with transverse closure due to its simplicity and excellent results as a day surgery procedure [8,9], but in few patients, foreskin deformities in form of dog ears have been noted on both sides of the suture [9].

We modified the dorsal slit preputialplasty by incising only the fibrotic band, undermining into both lateral sides for 4-6 mm and again incising the ring through the same incision. We found that fibrotic ring was better divided in 3 places through a small single incision. Mobilization of the lateral space gave contour a rounded appearance

instead of dog ears. In our series, the short-term results of limited dorsal slit preputialplasty were excellent in terms of view low occurrence of complications of edema, hematoma, inflammation and wound disruption apart from long-term retraction and cosmetic results.

The main limitation of our study was an observational design with absence of any control intervention. The generalizability of the results is likely to depend on the surgical expertise of the treating surgeons and patients volume of the handling units.

The results of previously reported studies in children undergoing preputialplasty showed a functional and cosmetic satisfaction rate of 77%-97.6% [10,11]. Cuckow, *et al.* [9] compared it with circumcision, and reported that preputialplasty is associated with few complications and good functional and cosmetic results, provided the prepuce is mobilized regularly after surgery.

This study suggests that limited dorsal slit preputialplasty is a safe surgical procedure for phimosis in children. It preserves the prepuce and has low complication rate, and seems to be a suitable alternative to circumcision. Future controlled studies are recommended with longer follow-up periods.

*Funding:* None; *Competing interest:* None stated.

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