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<http://www.pediatricurologycasereports.com>**An unusual complication of preputial adhesiolysis: From flimsy adhesions to bridging adhesions****Prabudh Goel, Minu Bajpai***Department of Pediatric Surgery, All India Institute of Medical Sciences, New Delhi, India***ABSTRACT**

Most male infants are born with a foreskin that does not retract then and this is normal; glanular-preputial adhesions are physiologic and universal. Separation of these adhesions is a continuously evolving process which happens gradually and spontaneously. However, inability to retract the prepuce or preputial ballooning may be a cause of significantly anxiety amongst the newly blessed parents. The situation in rural population is further compounded by the culture of 'oiling' the glans inherited ancestrally if not transmitted genetically. Herein, the authors submit to medical literature an unusual complication of preputial adhesiolysis –development of bridging glanular- preputial adhesions. The clinical and social aspects are discussed. A description of the procedure of adhesiolysis along with an insight into the embryology and relevant literature was considered indispensable.

**Key Words:** Preputial adhesions; phimosis; circumcision; physiological phimosis; prepuce; adhesiolysis.

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*Corresponding Author: Dr. Prabudh Goel,  
Pediatric Surgery, Room No. 4002, 4<sup>th</sup> Floor, Teaching  
Block, All India Institute of Medical Sciences, New  
Delhi, India. PIN 110029*

*E mail: [drprabudhgoel@gmail.com](mailto:drprabudhgoel@gmail.com)*

*ORCID ID: <https://orcid.org/0000-0001-6179-1625>*

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Herein, the authors are reporting an unusual complication of preputial adhesiolysis - development of bridging glanular- preputial adhesions.

**Introduction**

Preputial adhesions at birth are physiologic and universal; separation of the two is a continuously evolving process. However, inability to retract the prepuce or preputial ballooning may cause a significant anxiety amongst the newly blessed parents. The

**Case report**

An 8 year old boy presented in the out-patient department with complaints of inability to retract the prepuce and an abnormal appearance of the glans upon attempted preputial retraction. He did not have any

history of balanitis, balano-posthitis, recurrent urinary tract infections or any dermal affliction of the genitals.

At the age of seventeen months, he had presented to a physician with complaints of ballooning (inflation of the prepuce) of the penis at the time of micturition. He was diagnosed with having flimsy preputial glanular adhesions and advised local steroid cream for three weeks. The cream was only partially effective; the physician performed release of adhesions in the clinic after application of a local anesthetic. The parents reported local bleed during the procedure and for couple of minutes post-procedure.

Patient had burning pain in the region of the glans and the prepuce, and significant preputial edema post-procedure. He was advised an anti-inflammatory (ibuprofen) for three days and warm compresses. No local ointment was prescribed. Pain and edema settled within two weeks. The patient was so stressed due to this

event that he didn't try to retract the prepuce for the next couple of months.

Local examination of the patient's genitals revealed the presence of two separate bands of bridging adhesions between the glans and the inner prepuce (Fig. 1). Considering the site of frenulum be 6 o' clock position, the bands extended from 7-10 o'clock position and 2-5 o'clock position. The bands were lined by scarred skin with a relatively whiter appearance, rough feel and absence of blanching upon pressure. The skin of other parts of the prepuce including the tip of the prepuce was normal. It was possible to pass an artery forceps underneath each of the two bands in the coronal groove. These tunnels were obscured by pent-up 'smegma-like' secretions. It seemed impossible to release these adhesions without surgical division.

Symptoms and signs of urethral strictures, meatal stenosis and other features of balanitis xerotica obliterans were conspicuous by their absence.



**Fig. 1.** Clinical photographs depicting the presence of bridging preputial-glanular adhesions bands extending from 7-10 o'clock position and 2-5 o'clock position. The bands were lined by scarred skin with a relatively whiter appearance, rough feel and absence of blanching upon pressure. The skin of other parts of the prepuce including the tip of the prepuce was normal. It was possible to pass an artery forceps underneath each of the two bands in the coronal groove. These tunnels were obscured by pent-up 'smegma-like' secretions.

## Discussion

Most male infants are born with a foreskin that does not retract then and this is absolutely normal; glanular-preputial adhesions are physiologic and universal. Typically, the prepuce at the time of birth is long with a narrow tip, it does not permit retraction owing to its size and due to the fused inner mucosal surface of the prepuce with the glanular mucosa.

The term 'preputial-glanular adhesion' is actually a misnomer and has been used inappropriately. It is a normal developmental phenomenon and not pathology. However, both ballooning of the foreskin during micturition and physiological phimosis, reserve the potential to arouse significant anxiety and concern amongst the parents.

Embryological development of the prepuce occurs by the fusion of ectoderm, neuroectoderm and mesenchyme in the midline [1]. The combination of preputial folding and the ingrowth of a cellular lamella results in formation of not only the prepuce but also the glans, corona and the coronal sulcus mucosa. As a consequence, the mucosal epithelium of the glans penis and the inner mucosal lining of the prepuce is common.

The glans-prepuce separation is a gradual and spontaneous process which begins at 24 weeks of gestation and is generally complete by the age of three years but may extend upto puberty. Premature attempts to separate the glans from the prepuce may culminate without any adverse consequence but there is always a possibility of glanular excoriation and injury since it involves tearing apart the common preputial-glanular mucosa.

Ballooning of the prepuce is often one of the clinical presentations for which parents seek advice. It is the process of inflation of the prepuce due to the process of micturition. It

can happen only after separation of the inner prepuce from the glans but prior to adequate dilatation of preputial aperture. The condition is probably a milestone in the normal human development. Babu and Harrison et al investigated that the mean maximum urinary flow rate ( $Q_{max}$ ) was not significantly different in boys with ballooning and those without. They concluded that physiological phimosis with or without ballooning of the prepuce is not associated with noninvasive objective measures of obstructed voiding [2].

Clinical examination of the prepuce in babies should not be performed by pushing back the foreskin over the penis. The maneuver makes the preputial aperture look smaller than its actual size. Catzel described that the correct way to examine the prepuce and quantify the aperture size especially in younger babies is to grasp the foreskin between the index fingers and thumbs of both the hands and to pull it upwards [3]. However, the authors do not agree with this philosophy completely. In order to rule out the presence of preputial adhesions and phimosis, it is more important to ensure that the whole glans may smoothly slide out of preputial 'care' rather than the size of the preputial aperture.

Optimal age for preputial adhesiolysis: Gairdner noted that the prepuce was retractable in 4%, 50%, 90% and 92% children at birth, 1 year, 3 year and 5 years of age respectively [4]. Kayaba found the percentages of Gairdner to be an over-estimate; he classified the prepuce into five categories-type I – no retraction of prepuce at al., type II – external urethral meatus exposure only, type III – intermediate variety, glans exposed halfway, type IV – glans exposure to above the corona at the site of preputial adhesion(s) and type V – complete retraction possible [5]. Cold and Taylor have depicted graphically the incidence of preputial

adhesions and the retractability of the prepuce in various age groups in their landmark article on human prepuce [1].

The authors routinely dissuade separation of glanular-preputial adhesions prior to the age of three years. However, partial separation just enough to expose the meatus may be necessary when the babies are symptomatic with preputial ballooning during micturition. Beyond the age of three years, glanular-preputial adhesiolysis may be undertaken.

Procedure of preputial adhesiolysis: In the authors' unpublished experience, local application of steroid preparations for 4-8 weeks is associated with partial success in cases of preputial adhesions which fail to settle spontaneously. Gentle, manual release of adhesions is nearly always required.

Management of these bands may be undertaken in the clinic or inside the operating room. Gentle manual release of adhesions after topical application of a local anesthetic is the preferred approach.

Band division in the clinic: Depending upon the parental preference, child cooperation and the band thickness, decision to sever the bands in the clinic itself may be considered appropriate. Topical application of local anesthetic will facilitate regional injection of local anesthetic. The so called 'band' or 'bridge' of scar tissue may be crushed with an artery forceps and divided.

Band division inside the operating room: may be performed under general anesthesia with proper hemostasis.

All the patients are advised a) warm fomentation for local edema, b) local application of an antibiotic (Neosporin or mupirocin)-anesthetic (2% xylocaine) mixture. This is effective in providing significant pain relief, prevention of local colonization and in keeping a film of oil between the inner prepuce

and the glans to prevent development of adhesions again, and c) local cleaning at the time of taking bath. One has to be very gentle during the procedure to avoid any mucosal injury. The procedure when performed correctly is not associated with any bleeding. Presence of bleeding in the index case is an indirect indicator of mucosal injury.

Follow-up at one week to ensure adequate healing and completeness of preputial adhesiolysis and a supervised preputial retraction and reposition is the protocol. This information could not be surfaced in the index case; the formation of adhesions bridging the sites of mucosal injury could have been averted by adhering to this protocol. If the adhesions form in the first week after the procedure, they are expected to be flimsy and can be divided easily. Furthermore, regular application of the ointment mixture also serves to introduce an oil-film between the two mucosal surfaces and prevents their approximation.

Regular preputial retraction followed by replacing it in its normal position starting two weeks after the procedure is advised routinely. This will prevent development of adhesions again. The process becomes even more important if there are visible abrasions on the glanular surface or the inner preputial mucosa such as in the event of forceful or rough adhesiolysis. It would not be unreasonable to assume that this was either not advised or advice not heeded in the index case.

Preputial adhesiolysis is a seemingly benign procedure. Coupled with the parental anxiety, the procedure may be deployed by unscrupulous practitioners for raising 'easy money'.

### **Conclusions**

Preputial adhesiolysis is a benign procedure and is often performed by the junior member

of the team. We intend to emphasize the following by mean of this case; a) judicious use of this procedure and to avoid performing it in every other case, b) the need for being gentle while performing adhesiolysis to prevent any mucosal abrasions, and c) the need for preputial retraction at routine follow-up, and d) counseling of parents regarding local hygiene and protocolized preputial retraction at home.

### Compliance with ethical statements

*Conflicts of Interest: None.*

*Financial disclosure: None.*

*Consent: All photos were taken with parental consent.*

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