

# Surgical treatment of postcircumcision trapped penis

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**Background/purpose** Trapped penis refers to a phallus that has become entrapped by a dense cicatricial scar usually following circumcision. It is associated with cosmetic, psychosocial, voiding, and hygienic complications and concerns. Prompt treatment is usually required to alleviate concerns and prevent complications. The treatment is essentially surgical. This prospective study was carried out to report the surgical management of cases of trapped penis, the necessary steps/procedures needed, and the outcome of surgical repair, and parent satisfaction.

**Patients and methods** Patients with postcircumcision trapped penis indicated for surgical treatment were evaluated and managed. Evaluation included the age of patients, duration from circumcision, presenting complaints, predisposing conditions, surgical techniques, skin adequacy, and complications. The techniques used included scar excision, degloving, dermopexy, corporopexy, and skin coverage. Skin coverage was achieved by simple closure, split thickness skin graft (STSG), or scrotal flaps. One or more of the above-mentioned techniques were used depending on the individual characteristics of every case. The cases were evaluated for early complications, parent/patient satisfaction (evaluated subjectively), and recurrence.

**Results** A total of 21 children were surgically managed during a 5-year period. The mean age at the time of correction was 28 months (range: 3–133 months). The most common presenting complaints were anxiety and hidden penis. The mean time between circumcision and presentation was 13.9 months (range: 1–117 months).

## Background/purpose

Trapped penis is an acquired form of concealed penis [1,2]. Byars and Trier [3] were the first to identify a trapped penis following circumcision. The trapped penis occurs when a dense cicatricial scar tissue traps the penis under the prepubic or scrotal skin mostly following neonatal circumcision or trauma [1]. This condition occurs when excessive preputial and shaft skin is removed, during circumcision (overzealous circumcision), or other trauma to the penis. As a result, either the entire or a part of the penile shaft becomes entrapped in the scarred prepubic skin. It can also occur when insufficient preputial skin is removed – where the surface scars down over the glans – and during circumcision of the neonatal hidden penis (secondary to the buried penis, webbed penis, or in a boy with a large hydrocele or inguinal hernia) [1,4–6]. Parents of neonates express concern about the inability to see the penis, difficulty with proper hygiene, future function, and continuous dribbling between voids [7]. In its most severe form, this complication can predispose the child to urinary tract infections and may cause urinary retention [1,4]. The treatment of this condition is mainly surgical with different techniques used to achieve the principles of breaking down

The techniques used for repair included simple scar excision and skin closure in 17 patients, scrotal flap in one patient, and STSG in three patients. Dermopexy was added in seven patients, and corporopexy was added in four patients. Of the patients, six had buried penis, and one patient had megameatus intact prepuce. Parent/patient satisfaction was excellent to good in 95% of patients.

**Conclusion** Postcircumcision trapped penis should be treated promptly to alleviate complications and anxiety, and improve body image. The treatment is mainly surgical; conservative treatment can be tried in early and mild cases. Circumcision in the buried penis converts a minor procedure to a complicated one. Skin coverage after the release of the trapped penis is a challenge and multiple plans should be available. STSG is a good option for penile coverage. Associated conditions and predisposing factors can be addressed in the same operation. The knowledge and practice of circumcision need to be improved. *Ann Pediatr Surg* 10:119–124 © 2014 Annals of Pediatric Surgery.

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the trapping cicatrix, penile release, dealing with predisposing factors, for example, buried penis, and penile resurfacing in case of skin deficiency [6]. Techniques include cutting the fibrotic scar with scissors and pulling out the penis, penile degloving, corporopexy, suprapubic lipectomy, using multiple Z-plastics, split thickness skin grafts (STSGs), transposing pedicled scrotal skin flap, or two-stage repair after burying the penis in the scrotum [6,8]. However, more conservative treatment was also described, for example, dilatation of the phimotic ring with a fine hemostat under local anesthesia [1], or the use of repeated manual retraction with topical betamethasone cream application with good success [4].

This prospective study was carried out to report the surgical management of cases of trapped penis, the necessary steps/procedures needed, and the outcome of surgical repair, and parent satisfaction.

## Patients and methods

The study was conducted on 21 patients referred to Pediatric Surgical Unit, Tanta Faculty of Medicine, during the period from February 2007 to January 2012.

Ethical approval was obtained from Surgery Department Council. The study included male patients, with post-circumcision trapped penis (PCTP), aged between 1 month and 14 years. The exclusion criteria were patients older than 14 years, and patients with mild trapping successfully treated by conservative measures. The time between circumcision and presentation as well as the presenting complaints were reported. Examination focused on the detection of hidden penile size, and whether the remaining penile shaft skin will be sufficient to cover the penis after its release. We looked also for the presence of predisposing factors, for example; buried penis, hydroceles and excess prepubic fat, and penile hygiene. The surgical technique used was adapted to every patient depending on the specific features of every case.

- (1) *Simple excision of the cicatrix*: It was made in patients with fibrotic ring with adequate penile skin and with no predisposing factors. Under general anesthesia, three incisions about 2–3 mm were made at 12, 4, and 8 o'clock to enable retraction of the dorsal penile skin. A cuff of 2 mm including the cicatrix was excised circumferentially to preserve as much skin as possible to cover the penis. The skin was closed and a sterile dressing was applied for 24 h followed by local wound care.
- (2) *Scar excision, complete degloving, and dermopexy with penile skin closure* (Fig. 1): These were carried out for patients of buried penis with loosely attached penile shaft skin. Same previous steps followed by penile degloving till the root of the penis. Two fixation sutures were placed between the dermis and the tunica albuginea at the 2 and 10 o'clock positions to avoid the neurovascular bundles, and another two similar sutures lateral to the urethra, to restore the penopubic and penoscrotal angles, respectively. Polypropylene or PDS 5/0 sutures were used for this step.
- (3) *Corporopexy (fixation of the tunica albuginea to the pubic periosteum)*: This step was added for patients of retracted penis or penile amputation trauma to keep the penis protruding and prevent its retraction.

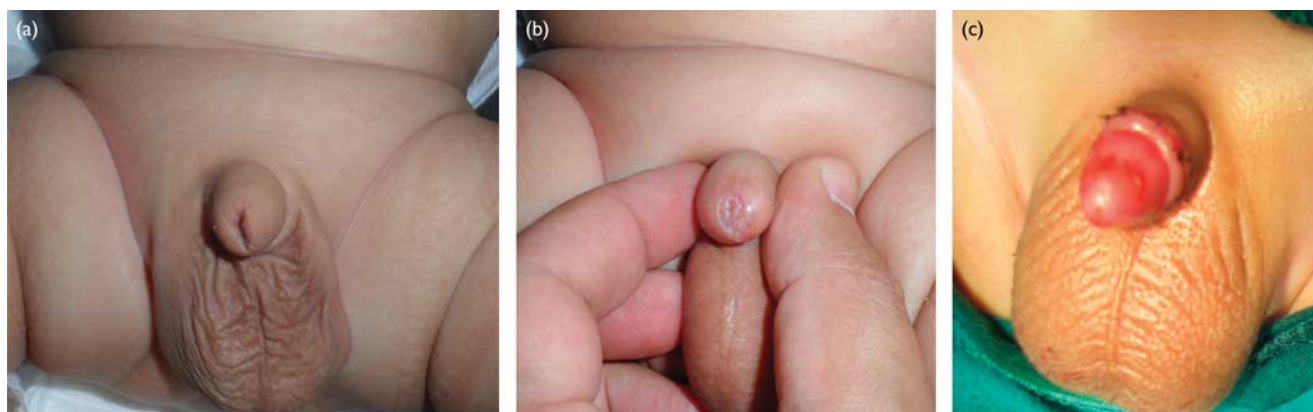
Polypropylene 4/0 sutures were used at the 3 and 9 o'clock positions.

- (4) *Cases with insufficient skin to cover the shaft of the penis after scar excision and penile release*: A pedicled scrotal skin flap or a STSG was used. The STSG was harvested from the upper thigh, meshed manually, and applied to cover the penile shaft with multiple 5/0 polyglactin fixation and tacking sutures. Sterile compressive dressing was applied for 10 days, and antibiotics were administered for 10 days postoperatively.

## Results

A total of 21 cases of PCTP were surgically treated in this study. The mean age of patients with trapped penis at the time of correction was 28 months (range: 3–133 months). The presenting complaints are represented in Table 1. The most encountered complaint, in almost all cases, was anxiety either about penile amputation or future function of the penis, this was followed by the covered penis and the inability to visualize it, difficult hygiene, inability to retract the penile skin, abnormal stream; whether weak, deflected, or splayed, and recurrent urinary tract infection. One patient claimed total penile loss with a failed phalloplasty, and another patient came with partial glanular amputation and underwent glanuloplasty. The mean time between circumcision and presentation was 13.9 months (range: 1–117 months). Of the total number of patients, 14 (66.7%) patients were severe (marked complete stenosis of the preputial ring scar, with impossible retraction), whereas seven (33.3%) patients were moderate (stenosis was not complete, minor degree of retraction possible). The glans was visible in one patient but was almost attached to the skin of the abdominal wall, and the whole shaft was trapped owing to overzealous circumcision. An 18-month-old boy was found to have a hidden megameatus intact prepuce after the release of the penis that was dealt with by glans approximation procedure technique in the same operation. Six (28.6%) patients presented with buried penis. Regarding the skin excision, circumcision was inadequate in seven (33.3%) patients, appropriate in 10 (47.7%) patients, and overzealous in four (19%) patients.

Fig. 1



(a) Trapped penis with adequate skin. (b) Minor degree of retraction possible. (c) Correction by simple scar excision.

The surgical techniques used in the treatment of patients with trapped penis in the study are: scar excision and simple skin closure performed on 17 patients, scrotal flap performed on one patient, and STSG performed on three patients. Dermopexy was added in seven patients, and corporopexy was added in four patients. The description of the three patients managed by STSG are as follows:

- (1) One case of overzealous circumcision with removal of too much penile shaft skin along with the prepuce was treated by release of the penis and coverage with a STSG (Fig. 2).
- (2) A complex case of an 11-year-old boy who presented with claimed postcircumcision (PC) penile loss from the inappropriate use of monopolar diathermy. The patient underwent a failed phalloplasty from the local groin tissues at another center. After releasing the dense cicatrix under general anesthesia, the shaft of the penis was found intact and buried with glanular loss. Complete penile degloving was performed followed by corporopexy. The resultant bare area of the shaft of the penis was resurfaced with an STSG.
- (3) An 8-year-old boy with PC glanular amputation underwent glanuloplasty from a buccal mucosal graft and presented with trapped penis because of

deficient shaft skin. Complete degloving, corporopexy, dermopexy, and STSG were performed (Fig. 3).

The patients were followed up for a minimum of 6 months and evaluated for complications and recurrence. The parents'/patients' satisfaction was evaluated on a subjective basis: they were asked to express their appreciation of the outcome as excellent, good, fair, and poor.

Complications included penile edema in four (19%) patients, mainly related to penile degloving, and were treated by compressive dressing and antiedematous drugs. One patient had persistence of the buried penis; this case was performed at 3 months of age, where simple scar release was used without dealing with the buried penis. This child is being observed for potential spontaneous improvement, to be re-evaluated at the age of 3 years. We have had no recurrences and no secondary surgery so far. Parents of 13 (61.9%) patients described the outcome as excellent, seven (33.3%) patients as good, and one (4.8%) patient as fair; the latter is the case of persistent buried penis.

**Discussion**

The most common antecedent of trapped penis in the literature is a circumcision that removes an excessive amount of skin from the penile shaft as well as the prepuce. The trapped penis may also be the result of removing too little inner perpetual skin [4,9,10]. According to Maizels classification, concealed penis is defined as a phallus of normal size that is buried in the prepubic tissue, enclosed in the scrotal tissue, or trapped by scar after penile surgery [2]. Trapped penis was also described as secondary penile concealment [11] or as type II concealed penis [10].

**Table 1 Percentage of presenting complaints**

Presenting complaints	Number of patients [n (%)]
Anxiety; amputation, and function	20 (95.2)
Covered penis	18 (85.7)
Difficult hygiene	9 (42.9)
Inability to retract the skin	7 (33.3)
Abnormal stream	4 (19)
Recurrent UTI	3 (14.3)
Claimed complete penile loss	1 (4.8)
Claimed glans amputation	1 (4.8)

All patients presented with more than one complaint.  
UTI, urinary tract infection.

**Fig. 2**



(a) Overzealous circumcision with trapped shaft. (b) Denuded shaft after release.



Fig. 3



(a) Trapped penis with glanular amputation and glanuloplasty. (b) Release and division of fibrous bands. (c) Corpororopexy. (d) Coverage by split thickness skin graft.

The true incidence of PCTP is actually unknown because most of the cases are referred as complicated cases carried out in diverse places. Blalock *et al.* [1] estimated the incidence of trapped penis to be 2.9% among children who underwent circumcision at his institution. In our study, all cases had their circumcision carried out in other places including other hospitals, private clinics, and at home. They were performed by physicians of different specialties as well as by traditional circumcisers. Accordingly, it is impossible to define the true incidence of PCTP among circumcised children.

Abbas *et al.* [11] listed the presenting complaints of patients in a descending order where cosmetic concerns came first (60%), then voiding concerns (56.6%), and then psychosocial concerns (50.5%). In our study, anxiety was the first complaint representing about 95%, followed by cosmetic concerns. This can be attributed to the fact that, in a study by Abbas and colleagues, only eight of the 30 patients had trapped penis, whereas 22 had buried penis. All our patients had trapped penis, where the penis was invisible (except one patient) and cannot be expressed out of the scar, thus, concerns about trauma and future function were greater.

Because the condition predisposes to complications, the parents are very anxious and the scar tends to further tighten as it matures; the condition should be treated as soon as it is diagnosed and the treatment is mainly surgical [4,8,10,12]. Surgery is a reliable means to address both the trapped and buried penises and to alleviate both parents' and patients' negative concerns [11]. Although Palmer *et al.* [4] reported a 79% success with betamethasone treatment combined with manual retraction, and Blalock *et al.* [1] described gentle dilatation of the phimotic ring with fine hemostat to break open the scar under local anesthesia as an outpatient procedure, the cases in both series presented within 4 weeks of circumcision, which could be a factor in success of these less invasive forms of treatment. We tried medical treatment only in early and moderate cases where any degree of retraction can be done. The indication of surgery was failure of medical treatment for 4 weeks in seven patients. However, the indications of whether or not to try medical treatment are loose and need to be defined.

Multiple techniques are used to treat the trapped penis. All of them aim at excision of the phimotic ring, release of

the penile shaft, and skin coverage [8,10,11,13]. Trapped penis can occur after (regarding amount of excised skin) appropriate, inadequate, or overzealous circumcision, sometimes with a predisposing factor. Accordingly, release or excision of the scar with skin closure can be sufficient. A sleeve correction of circumcision will be needed in cases of inadequate circumcision. The adequacy of the skin to cover the penis after its release cannot be judged, except after incising the scar and pulling out the penis, because, although the penile skin may appear deficient, a long mucosal cuff may be hidden under the scar. This long mucosal cuff possibly predisposes to trapping. Cases with the anchoring fibrous dartos bands and cases with buried penis will need degloving, and either a dermopexy, corporopexy, or a combination of them, to deal with the underlying etiology [2,8,10,11,14–17]. However, we had a case of a 3-month-old boy with a buried penis, with sufficient remaining skin, whom we treated by simple excision of the cicatrix and kept him under watchful waiting for a spontaneous resolution. Although the parents were disappointed by the results, this could be because of bad preoperative counseling and explanation for them. In the literature, surgical treatment of buried penis was performed as early as 3 months of age [2,5,18–20], whereas others recommended waiting till the age of 2–3 years for the possibility of spontaneous resolution [8,14,21–23]; both options can be applied to cases of trapped penis with buried penis and remaining sufficient penile skin.

Circumcision in neonates with buried penis is discouraged, as circumcision may aggravate the buried condition of the penis [7,8,22]. In fact, circumcision in a patient with a concealed penis can turn a relatively simple procedure into a complex reconstructive procedure that has a high risk of postoperative complications and of parental and patient dissatisfaction [2,7,24]. It is essential that primary care physicians be aware of this fact. Failure to recognize this problem during precircumcision penile examination can result in inadvertent removal of excess skin from the penile shaft as well as PCTP [16,25–27]. Our institution's policy is to observe these children until the age of 2–3 years and perform circumcision alone or along with a corrective procedure for the buried penis.

The resurfacing of the deficient penile shaft skin is one of the challenges after releasing the trapped penis. Different modalities of skin coverage had been described, including use of vascularized flaps [6,8], STSG [6,7,23,24,28], multiple Z-plasties [6,24], and two-stage repair after burying the penis in the scrotum [17]. The best method of skin coverage remains controversial and depends on patient circumstances and surgeon experience and preference. Every method has its advantages and disadvantages. The use of an STSG for penile skin coverage was advocated by some surgeons [7,28]. STSG is an almost ideal aesthetic match for the penile skin, with almost normal mobility of the skin. It is also devoid of hair [28]. Recovery of sensation usually takes years, but finally it is adequate if not completely normal [7,28]. Erogenous sensation is thought

to be weak but this needs long-term follow-up into adult life. STSG can also cover any area of the denuded penis. Pedicled scrotal flaps are located near the shaft, have normal erogenous sensation, are well vascularized, and retain normal mobility over the shaft. However, they have the disadvantage of being hirsute [6]. The potential skin coverage using the scrotal skin can be limited and less generous than STSG; therefore, the latter was used in three of four cases in this series.

Results after trapped penis repair are reported to be good or excellent [8,11,15]. Radhakrishnan *et al.* [8] operated on 17 patients with PC cicatrix and reported excellent results. Casale *et al.* [10] managed 18 boys with postsurgical cicatricial trapped penis, of which 17 were after circumcision and reported good results in 78% of them. Abbas *et al.* [11] had eight patients of trapped penis in his series of the 30 patients with concealed penis, but he described the results of all the repairs to be very good. In this series, about 95% of cases described the outcome as good to excellent; less satisfied cases were related to cases associated with buried penis. Therefore, expectations should be properly evaluated and discussed preoperatively.

## Conclusion

PCTP should be treated promptly to alleviate complications and anxiety, and improve body image. The treatment is mainly surgical; conservative treatment can be tried in early and mild cases. Circumcision in buried penis converts a minor procedure to a complicated one. Skin coverage after release of trapped penis is a challenge and multiple plans should be available. STSG is a good option for penile coverage. The knowledge and practice of circumcision need to be improved.

## Acknowledgements

### Conflicts of interest

There are no conflicts of interest.

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