

Minimally invasive technique for the concealed penis lead to longer penile length

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Accepted: 2 February 2010 / Published online: 18 February 2010
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Abstract

Objectives The aim of this study is to report a simple and minimally invasive surgical technique for congenital concealed penis repair.

Methods Described technique includes two approaches based on common principle, which could be selected according to the degree of penis buried. Through the minimally invasive incision at the base of penis, the repair is performed combination of tacking penile base to prepubic fascia and anchoring subcutaneous penile skin to base of penile shaft. The outcome of the operation is evaluated by improvement of penile length and satisfaction of penile appearance.

Results A statistically significant difference of the penile length between preoperative and postoperative was 2.6 cm for procedure I, and 2.7 cm for procedure II ($P < 0.001$). There were 58 parents (93.5%) satisfied with the result. No serious intraoperative or perioperative complications. Edema and swelling on the penis are common, but improves with time. All patients are followed for at least 5 months, no retractions occur in any case.

Conclusions The described technique is simple and minimally invasive. Excellent cosmetic results are achieved with low complication rate and high parent satisfaction. In our experience, there were no additional procedures required to perform deglove or reorganization of the penile skin.

Keywords Penis · Concealed penis · Surgery · Repair · Minimally invasive

Introduction

Management of concealed penis continues to evolve, with several papers having been published over the last several decades. Each describes a novel surgical approach that differs from the incision lines and covering techniques [1]. Several surgical solutions have been proposed for resolving penile concealment with successful outcomes. Those include lysis of tethering bands, reorganization of the penile skin, and suprapubic lipectomy through the abdominal crease. Nevertheless, some limitations exist and compromise the results of surgical correction [2].

We describe a simpler technique that based on our comprehension of the anatomical basis of this condition. This technique includes basal fixation of penile shaft and restoration of subcutaneous penile skin, which allows surgeons to deal with most cases of congenital concealed penis without degloving and reorganizing the penile skin.

Materials and methods

Patients

We designed and have been using, since 2004, this new technique to correct concealed penis. Patients who underwent previous circumcision, penile trauma or combined with congenital genital abnormalities were excluded. From January 2004 to May 2008, there were 62 cases with concealed penis, aged from 5 years 6 months to 12 years, who received the new technique. All operations were done by same well-experienced urologist. The objective outcome of operation was judged by improvement of penile length (from the base of the penis to the tip of the penis perpendicularly in the flaccid state). The Wilcoxon

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signed-rank test was used to compare the difference of penile length before and after surgery. The subjective outcome was determined from a questionnaire answered by boys' parents who were tested the level of satisfaction for the surgical outcome "unsatisfactory," "good," or "excellent". A telephone followup was performed to tracing the postoperative outcome.

Surgical techniques

The technique contains two different surgical approaches which allow the surgeon to select depending on the different degrees of penis buried (described as procedure I and procedure II). The procedure I was applied for the less severe patients who could acquire improved appearance of penis by application of pressure at the base of penile shaft, while the procedure II was suitable to those who could hardly get improved appearance by this diagnostic operation (Fig. 1).

The procedure started with separating prepuce from the glans. A 0.5-cm longitudinal dorsal incision of prepuce is helpful for the cases with serious phimosis. Then, a longitudinally oriented 5-0 silk traction suture is placed deep into glans and snapped. Pull the silk suture taut to prevent penis retraction and help unfurl penile skin during the operation.

The procedure I started from bilateral arc incisions at the base of penis (penoscrotal junction) (Fig. 2). A dissection was made, respectively, to the dartos fascia and the Buck's fascia to expose the Tunica albuginea (Fig. 3). Penile shaft was then secured to prepubic fascia in the stretched state with two 4-0 PDS sutures at 3 and 9 o'clock, respectively (Figs. 4, 5). The subcutaneous penile skin was fixed to the base of penile shaft with two 4-0 PDS sutures.



Fig. 1 Improved appearance acquired by application of pressure at the base of penile shaft

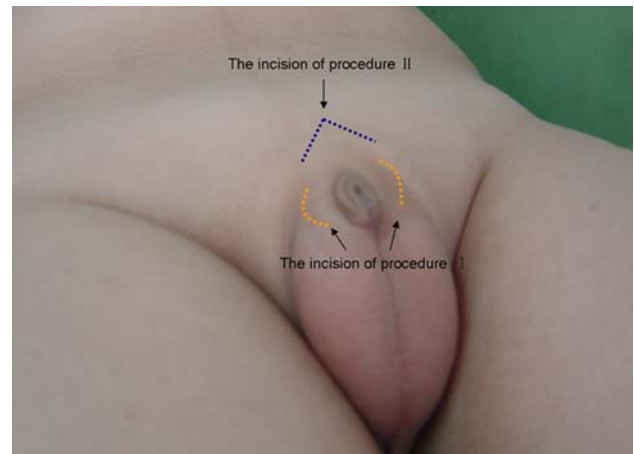


Fig. 2 Sketch map of the incisions of the two procedures



Fig. 3 Dissection of the dartos fascia and the Buck's fascia to expose the penile shaft

In procedure II, an inverse "V" graphemic incision was first made near the penile base on 12 o'clock (Figs. 2, 6). A silk suture placed on the distal edge of incision flap to unfurl it. Under the incision flap, a dissection proximally along Buck's fascia was performed to free the penis from its deep tethering. Cut off part of the suspensory ligament was helpful to improve exposed length of the penile shaft. Then, the penile shaft was secured to the prepubic fascia in the stretched state and the subcutaneous penile skin was fixed to the base of penile shaft with 4-0 PDS sutures at 3, 9 and 12 o'clock, respectively (Fig. 7). Dorsal penile nerves were avoided and sutures were placed longitudinally to minimize accidental damage to the nerves. The tension of dorsal skin, which caused by the penile shaft stretching could be alleviated by the inverse "V" to inverse "Y" plastic surgery (Fig. 8). A foreskin plasty was performed at the end of the operation.

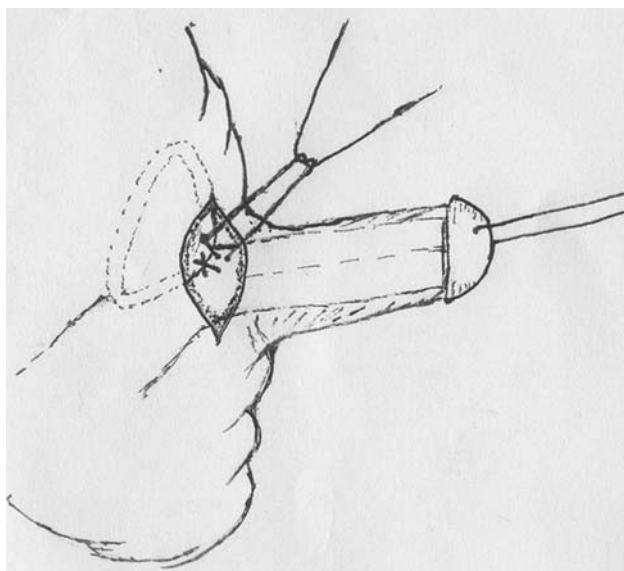


Fig. 4 Suturing of penile shaft base to the prepubic fascia in the revealed state at 9 o'clock (procedure I)

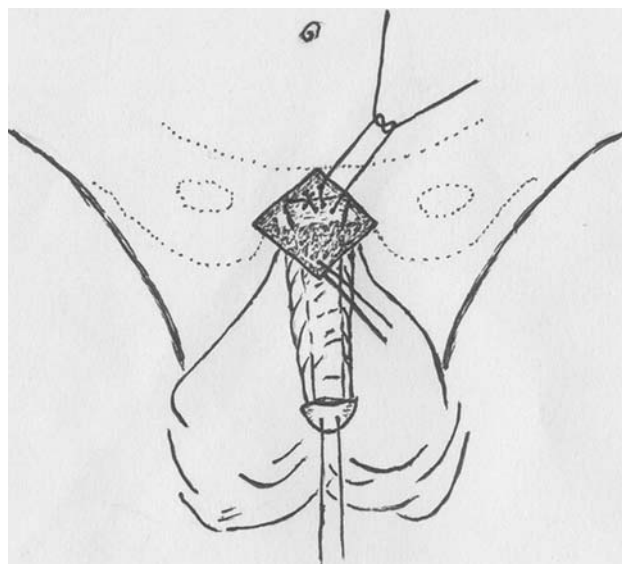


Fig. 7 Suturing of penile shaft base to the prepubic fascia in the revealed state at 12 o'clock (procedure II)



Fig. 5 Appearance after procedure I



Fig. 8 Inverse "V" to inverse "Y" plastic surgery to alleviate the tension of penile skin



Fig. 6 The inverse "V" graphemic incision of procedure II

After completion of the procedure, a 12 F Foley catheter was placed and removed in 48 h. The penis was covered with a compression dressing and removed after 3 days. All patients receive prophylactic antibiotics on the day of operation.

Results

The comparison results between procedure I and procedure 2 were shown in Table 1. A total of 26 patients underwent procedure I, and the other 36 patients received procedure II. The mean operative time was 41 ± 12 min for procedure I and 47 ± 11 min for procedure II. No serious intraoperative or perioperative complications. Edema and

Table 1 Indications for the two procedures

	Proc. 1	Proc. 2	Total
N	26	36	62
Operative time, min	41 ± 12	47 ± 11	
Penile length, cm			
Preoperative	1.4 ± 0.7	1.1 ± 1.0	1.2 ± 0.8
Postoperative	4.0 ± 0.5	3.8 ± 1.1	3.9 ± 0.7
Subjective outcome			
Satisfactory	25	33	58
Excellent	15	8	23
Good	10	25	35
Unsatisfactory	1	3	4
Complications			
Edema and swelling	24	36	60
Hollow in incision	3	14	17

swelling on the penis are common, but improves with time. The median difference of the penile length between preoperative and postoperative was 2.6 cm (range 2.0–3.9) for procedure I, and 2.7 cm (range 1.7–4.1) for procedure II. The difference was statistically significant for both of the procedure ($P < 0.001$). The total subjective outcome was satisfactory for 58 patients, but unsatisfactory in 4, for who consider the appearance improve unobscurely. Even in patients with subjective “unsatisfactory” results, the objective outcome still showed an increase in penile length (increase 2.1, 2.1, 2.3 and 2.4 cm, respectively). With a median followup of 7.6 months (range 5–12), there were no retractions occur in any case.

Patients who underwent procedure I may suffer from hollow in incision and more obvious edema of penis. Those conditions thought to be caused by the lipid removal and lymphatic obstruction. None of them required further surgery. Although we did not recommend suprapubic lipectomy or liposuction on any patient, part of the lipid in the incision was removed during the operation. Because of the too thick lipid impede the surgical operating space in some obese patients.

Discussion

Concealed penis is a common condition in clinical patients. It is defined as a phallus of normal size buried in prepubic tissue (buried penis), enclosed in scrotal tissue (webbed penis), or trapped by scar tissue after penile surgery (trapped penis) [3]. This condition characterized by poor fixation of penile skin, excessive suprapubic fat, abnormal fibrous bands of dartos fascia and thick fibrous bands extending from Scarpa’s fascia of the abdomen onto the distal penile shaft, tethering and shorting the corporeal

bodies [4–7]. A variety of surgical techniques which produced excellent results have been reported [8–13]. These techniques include removal of excessive suprapubic fat [9, 10], release of the dartos tethering bands [6, 9], anchoring the suprapubic skin to define the penile angle [11], basal fixation of penile shaft [12], and shaft skin reconstruction with various skin covering methods to correct for the sparse shaft skin [1, 3, 13]. The removal of excessive suprapubic fat was not a routine method; the other four methods have been recognized necessary in most concealed penis.

Generally speaking, most of congenital concealed penis has phimosis. The poor basal attachment of the penile shaft make it inadequate extension, which results in subcutaneous penile skin cannot attached to the normal place but pile on the tip of penis [12]. To our knowledge, the penile skin of concealed penis is enough to cover the penile shaft if the cumulated penile skin could be successful unfurled, even in partial of previously circumcised boys [14]. Of our 62 patients, 26 acquired improved appearance of penis by application of pressure at the base of penile shaft to help unfurling the penile skin. It seems that not the abnormal fibrous bands but the insufficient exposure of penile shaft and poor fixation of penile skin result in the abnormal appearance of penis in those patients. With our procedure I, this condition of concealed penis would be simply repaired through bilateral arc incisions at the base of penis.

However, most of the patients cannot be repaired by the procedure I for the abnormal fibrous bands tethering and shorting the penile shaft. Previous reports revealed that one of the mechanisms of the concealed penis is that the abnormal fibrous bands tethering the penile shaft and concealed penis will recur if releasing of the dartos tethering bands had not been done [6, 9]. Several surgical techniques of dartos tethering bands releasing have been reported. The common point of them was the dissection proximally between buck’s and the dartos fascias to the base of the penis [15–17]. The basic principle of the procedure I was similar with the previous; however, the place and scope to release the tethering bands was different. In our experience, most of the tethering bands appear in the proximal dorsal of subcutaneous penile skin. With the procedure II, we could dissect the tethering bands at the dorsal of the penile base through the inverse “V” graphemic incision to avoid degloving or widely dissecting. Furthermore, the inverse “V” graphemic incision was convenient to cut off part of the suspensory ligament which was helpful to stretch the penile length.

The common points of the two approaches include basal fixation of penile shaft and restoration of the subcutaneous penile skin. The attachment of penile shaft to prepubic fascia provides a better angle of the penis and prevents retraction. Firm attachment of subcutaneous penile skin to

the base of penile shaft improves appearance and further prevents retraction. The different between them is the surgical approaches that used to release and fix the penile shaft which could be selected according to the degree of penis buried.

The advantage of this technique was simple and minimally invasive. We did not performed any deglove or reorganization of the penile skin in patients. Because it was minimally invasive, patients suffer slighter perioperative edema and swelling after operation. Although the edema was more obvious in the patients who received the procedure II, no patient last more than 2 weeks. The disadvantage was the hollow under the incision, especially in the patients who underwent the procedure II. Although most of the patients would recover, several of them still exist in the end of the followup. However, the parents and patients, in general, found that such cosmetic factors were relatively unimportant.

Conclusions

Our technique for freeing the concealed penis is aimed at unfurling the accumulated penile skin, providing an improved penile shaft length, and anchoring the penile shaft and subcutaneous penile skin in the revealed state to prevent retraction. The novel approaches described here are simple and minimally invasive. Excellent cosmetic results are achieved with low complication rate and high parent satisfaction.

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