

Severe forms of concealed penis without hypospadias: Surgical strategies

Lisieux Eyer de Jesus^{1,2}, Samuel Dekermacher², Kleber M. Anderson²

¹Department of Surgery/Pediatric Surgery and Urology, Antonio Pedro University Hospital Fluminense Federal University,

²Department of Pediatric Surgery and Urology, Servidores do Estado Federal Hospital, Ministry of Health, Rio de Janeiro, Brazil

ABSTRACT

Introduction: Concealed penis (CP) may vary in severity and includes megaprepuce (MP) as a variant. Many different surgical strategies have been described in order to maximize penile exposure and to deal with skin deficiency. We describe the strategies that we use to overcome technical problems in severe cases of CP.

Materials and Methods: Six consecutive cases of severe CP (including 3 with MP) were treated in a 2-year period between January 2011 and April 2013. These patients were treated using extensive degloving, removal of dysplastic dartos, Alexander's preputial flap, scrotal flaps and skin grafts. Three patients had been previously circumcised. Cases associated with hypospadias, obesity, disorders of sexual differentiation and micropenises were excluded.

Results: All six patients attained good results, with good exposure of the penis, ability to void standing with a well-directed flow and reasonable esthetic results. A technical algorithm for the treatment of primary or recurring cases of CP is proposed.

Conclusion: Alexander's distally based ventral preputial flap is a useful technical resource to treat MP cases. Free skin grafts and/or laterally based scrotal flaps may be used to cover the penis after release in severe cases of CP.

Key words: Concealed penis, megaprepuce, trapped penis

INTRODUCTION

There are various causes of inconspicuous penis. Concealed penis (CP) is a relatively rare congenital form caused by dartos dysplasia and abnormal fixations.^[1] Primary CP can be complicated by megaprepuce (MP).^[2,3] Appearance of the child's penis is common cause of familial concern. Behavior problems are usual among older boys, who characteristically avoid exposing their genitals and exhibit abnormal shyness.^[4] Clinical problems are less often seen but recurring balanitis, dysuria, post-voiding dribbling

and inability to hold the penis and void standing may occur. After adolescence, sexual problems (dyspareunia and difficult penetration) may arise.

Reconstruction of CP is frequently delayed because the condition is erroneously attributed to obesity. Surgical treatment may be difficult in severe cases due to the lack of tissues to cover the newly exposed penis. Multiple techniques have been described and there is no consensus about the best strategy to follow.^[1,5]

Technical problems are amplified in older children particularly after unsuccessful previous surgeries that cause scars and reduce skin and preputial mucosa. Recurrences are common as well as severe scarring, bad esthetic results and persistent edema.

We describe the strategies that we use to overcome technical difficulties in severe cases of concealed penises not associated with hypospadias and suggest a unified clinical algorithm.

MATERIALS AND METHODS

Six consecutive severe cases of CP, defined as recurrent and post-circumcision CP, MP or primary CP with minimal penile exposure (<2 cm in boys ≥ 3 years old) were treated in

For correspondence: Dr. Lisieux Eyer de Jesus, 52, Presidente Domiciano St, apt 801. Boa Viagem, Niterói, Rio de Janeiro, Brazil. CEP 24210-270. E-mail: lisieux@uol.com.br

Access this article online	
Quick Response Code: 	Website: www.indianjurol.com
	DOI: 10.4103/0970-1591.163308

a 2-year period between January 2011 and April 2013. Cases associated with hypospadias, obesity boys, disorders of sexual differentiation, webbed penises and true micropenis have been excluded. All families consented to the non-identified publication of their sons' cases and photographs. No ethical approval is required in our institution for retrospective reviews.

The surgical steps described in Figure 1. A stitch is placed on the glans for traction. A circumcising incision is performed 5 mm proximal to the sulcus. In primary cases of MP, a V flap of mucosa based at the sulcus is designed, as described by

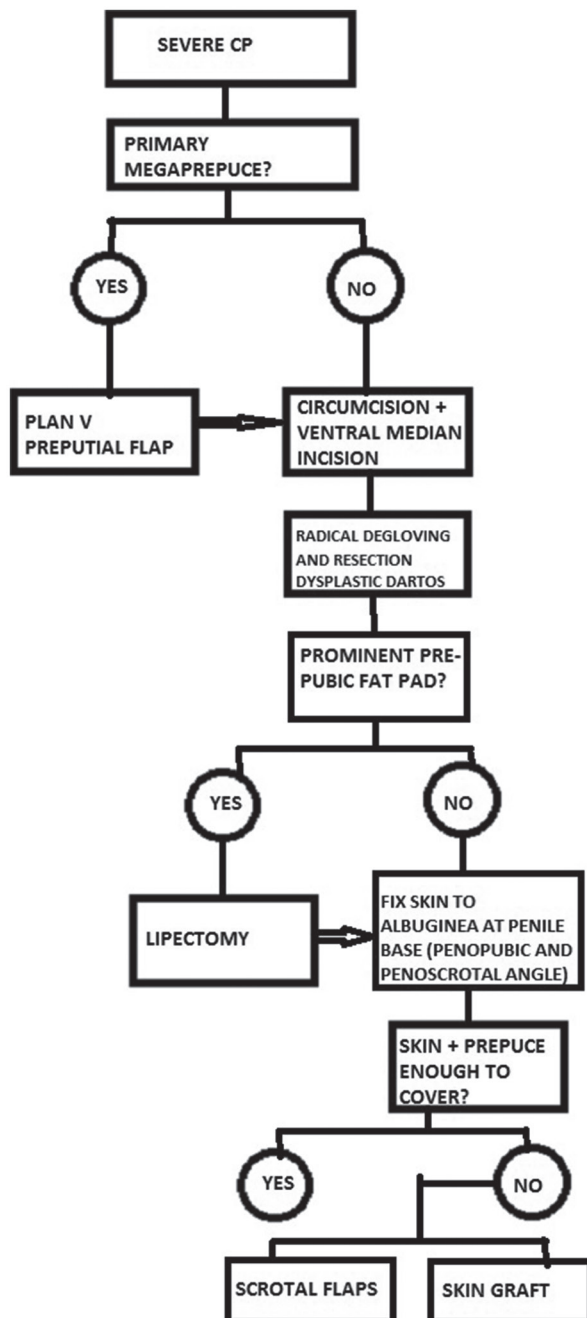


Figure 1: Algorithm for surgical strategy in concealed penis cases

Alexander *et al.*^[3] This flap may be used for penile coverage or discarded at the end of the surgery. A median ventral incision is added, limited at the penoscrotal junction. The penis is then degloved in the plane between the dartos and the corporal adventitia and dissected free to the pubic bone level. Abnormal dartos fixations are cut. Abnormal suspensory ligaments are cut, totally or partially, as needed. Dysplastic/inelastic dartos is resected. Lipectomies are performed only in patients presenting prominent pre-pubic fat in a caudal to proximal direction, departing from the proximal penile skin limit, working between the skin and the periosteum in the trapezoid space limited by the two spermatic cords, the proximal limit of the penile skin and the cranial extremity of the pubic symphysis. Care should be taken not to harm the spermatic cords during this step. The penile skin (dermis) is then fixed to the adventitia of the corpora, reformatting the penoscrotal and penopubic angles, using fine PDS stitches longitudinally placed without tension, carefully avoiding the neurovascular bundle on the dorsal side. Lateral fixations of the penile skin to the corpora are also inserted as needed. At this moment, the surgeon judges whether the available penile skin and preputial mucosa is sufficient to cover the penis. When the preputial mucosa is needed in order to cover the penis, it is important that the mucosal flaps are kept tight but tensionless in order to get the best esthetic results. Skin reconstruction must not be tense or put traction on the scrotum in order to avoid recurrence, iatrogenic webbed penis or skin dehiscence. If native penile skin and mucosa are not sufficient for reconstruction (which occurs frequently in previously circumcised or recurrent cases), we propose to resolve the situation by using the available penile skin to reconstruct the dorsal side (frequently by suturing two lateral flaps together in the dorsal median line) and to build laterally based translation scrotal flaps to cover the ventral side of the penis [Figure 2]. If skin for reconstruction is not sufficient even after using scrotal flaps, we employ inguinal skin grafts, preferably placed ventrally, in order to disguise eventual tissue discoloration and scarring. The usage of inguinal skin

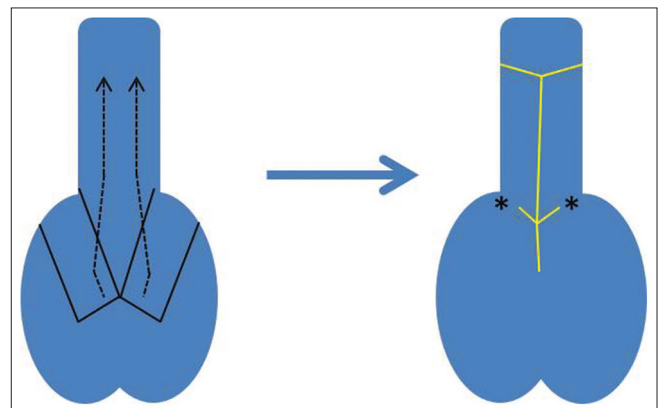


Figure 2: Scrotal flaps: Design and positioning of the laterally based scrotal flaps. Yellow lines: Sutures (flap to flap at the median ventral line, flap to preputial mucosa, scrotal reconstruction). *shows the vascular supply of the flaps

is advantageous as it is hairless and next to the penis and the resulting scar is easy to disguise under clothing. Skin sutures must be performed by using separated subcuticular fine stitches (preferably 6.0 rapid absorption white polyglactin) to get inconspicuous scars and to avoid cutaneous sinuses. A moderately compressive dressing is applied for 3 days. Urethral catheters are used at the discretion of the surgeon. A vacuum drain in the pre-pubic space is placed for 24–48 h in the lipectomy cases. Antibiotics are initiated in the anesthetic induction and maintained for 3–5 days, justified by the extensive dissection, creation of dead space and the risk of skin ischemia related to skin flaps and grafts.

RESULTS

Three patients (9, 1 and 7 years old) had previously been circumcised at 7, 9 and 24 months of age; two of them with simultaneous fixation of penopubic and/or penoscrotal angles [Table 1]. All previously circumcised patients exhibited a trapped penis, incarcerated by a tight fibrotic scar (iatrogenic phimosis). In the reoperation, penopubic fixations were loose and corresponded to superficial conspicuous scars in both patients. 5 patients were sent for treatment for primary or recurring phimosis and/or “redundant prepuce.” All school-aged boys were extremely concerned because of a “diminutive penis” and the patients avoided to change clothes or to void in front of others. One boy still needs psychological support, despite good results from his surgery. All parents were extremely concerned with their sons’ “diminutive” penises. Degloving and reformatting of the penile skin were enough for reconstruction in only one boy. In three patients, ventral scrotal flaps were necessary to cover the penis ventrally. In two of those patients (both previously circumcised), free skin grafts taken from the inguinal region were also needed [Figure 3]. Two primary cases of MP (2 and 5 years old) were treated with Alexander flaps [Figure 4]. After a minimal follow-up of 6 months (0.5–3 years), all patients are able to void standing, with

good penile exposure and esthetic results. The grafted areas show a lighter color as compared with the native penile skin, but are getting progressively better with longer follow-up periods. In the patients treated with Alexander flaps, the ventral mucosa incorporated in the reconstruction is hardly distinguished from the remaining penile skin and there is no residual edema [Figure 4].

DISCUSSION

CP is an uncommon condition. A mean of 10 cases/year are reported by the biggest series from referral centers, generally including hypospadias cases and exclusively primary cases. Ours is a very selective series, concentrating on severe and post-operative recurring cases not associated with hypospadias. We acknowledge that we chose to study three anatomically different groups of CP. However, our objective was to suggest a unified algorithm to treat severe cases of non-hypospadias-associated CP, regardless of their specific diagnoses. Cases of primary congenital CP must be referred to experts, considering the complexity of reconstruction and the added technical difficulties in recurrent cases.

Primary CP is diagnosed by the insufficient exposure of the penis despite a normally sized palpable organ plunged under the skin. Associated phimosis is common. Those penises are cone-shaped, with unclear penopubic and penoscrotal angles. Interestingly, cases of inconspicuous penis associated only with obesity can be differentiated from CP as they maintain a cylindrical form and show a circumferential groove at the basis. MPs are a special form of CP.

CP has been classically attributed to young age (“chubby baby”) and obesity. Families are frequently counseled against surgery and told to stimulate children to lose weight, exercise and wait for pubertal penile growth. Those dogmas extend concepts that apply to adults^[5] and lead to delay in treatment that may cause a lot of psychological

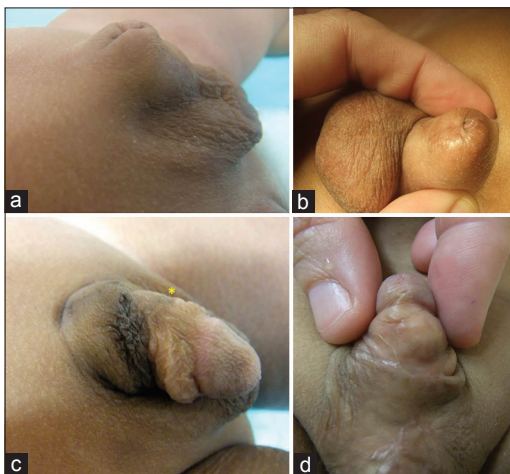


Figure 3: Case 5 (a) pre-operative aspect, (b) post-operative, dorsal view and (c) post-operative, (d) ventral view with graft



Figure 4: Case 4 (a) pre-operative aspect, (b) peri-operative view of the mucosal flap, (c) mucosal flap, 1-year follow-up and (d) final result

Table 1: Summary of clinical data

Case	Age (years)	Presumed diagnosis	Previous surgery	Pre-operative behavior problems	Surgery	Post-operative behavior problems
1	9	Phimosis and redundant prepuce	None	Severe	A, B	Resolved
2	9	CP	Circumcision and skin fixation, 7 mo, GPS	Severe	A, B, D	Moderate
3	1	Phimosis	Circumcision, age 9 mo, GU	None	A, B, D, E	None
4	5	Phimosis	None	Moderate	A, B, C	None
5	7	CP	Circumcision and skin, 2 yo, GPS	Moderate	A, B, D, E	Moderate
6	2	Phymosis and small penis	None	None	A, B, C	None

CP=Concealed penis, GPS=General pediatric surgeon, (A) Dartos resection/radical degloving, (b) skin redistribution, (c) Penile fixation, (d) scrotal flaps and (e) skin grafts

suffering to children. Primary CP in children is a congenital condition and does not resolve with weight loss. We agree with other authors^[2] who advocate surgery between 1 and 3 years of age and to avoid psychological problems that may be more serious and persist after penoplasty in older patients.^[4] Also, worrying recent experimental work suggests that buried penis can affect the structure and function of the corpora cavernosae,^[6] which is correlated with buried time.

Simple circumcisions with or without fixation of the penile skin to the base are commonly adopted to treat CP, as our cases attest. However, as dartos abnormal fixation and dysplasia are fundamental to the disease, unless radical penile degloving, severing of all abnormal fixations and resection of dysplastic dartos are performed, there will be a high risk of recurrence, as formally reported by Chuang *et al.*^[7] Trapped penis caused by errors in circumcision is uncommon in normal penises (2% of the complications of circumcisions in a referral hospital),^[8] but the situation is different in CP, where circumcision is contraindicated, as it reduces the tissues that should be used for penoplasty and may complicate with secondary phimosis and trapped penis.^[2,9-12] This is a frequent mistake and recurrent cases of CP are commonly referred for recircumcision.^[11]

MP is a recently recognized form of CP^[13] and presumably happens in CP exposed to high pressures within the preputial cavity for a long time in patients with tight phimosis.^[2,3] In those children, the penile tissues are progressively pushed in the direction of the pubic fat pad and scrotal tissues as urine under pressure is trapped in a large preputial cavity. Children may present post-voiding dribble. Contrary to an intuitive reasoning, MP cases lack skin for reconstruction after penile release. Many techniques try to take profit from the relative surplus of mucosa for reconstruction by using distally based preputial flaps,^[14,15] including the V flap technique^[3] and preputial unfurling.^[16] The usage of dartos-based vascularized dorsal preputial flaps^[10,17,18] restricts the resection of abnormal dartos and has to be judged in a case-to-case basis. Any redundant mucosal excess may be unsightly. The V flap (Alexander) technique has been recently described and there are no long-term follow-up cases described till now. The case described here proves that

the flap incorporates well and assumes the aspect of normal skin without persistent edema. Unfortunately, the usage of distally based preputial flaps is not possible in previously circumcised patients.

Techniques that use incisions at the base of the penis or are based on long circumferential distally based preputial flaps are especially prone to persistent edema. Esthetics is extremely important in penile surgery, even more nowadays, as genital exposure becomes more and more frequent. The surgeons must not only provide a functional but also a normal-appearing penis with the least possible scarring. That is why we do not advise the usage of techniques based on external (transcutaneous) stitches to fix the skin to the base of the penis.^[11,19] The direct fixation of the corporeal albuginea to the pubic periosteum can cause painful erections and is associated with a high index of recurrence.^[11]

Lipectomy is a highly controversial topic in CP treatment.^[11] Some authors highly recommend it while others contraindicate its usage and some use it selectively. In our opinion, lipectomy alone is not sufficient to treat CP but should be judiciously used in patients presenting a prominent pre-pubic fat pad.

In cases of extreme skin shortage, the usage of skin grafts or surgery in two stages (first burying the penis under the scrotal skin, to be released and covered with the scrotal skin after 6 months)^[20] are possible. Specific disadvantages are the need of two surgical stages and coverage of the penis with hairy scrotal skin. The usage of grafts is uncommon in genital surgery, but the literature is poor and most information derives from adult patients. Penile split-thickness grafts have been previously reported,^[21-23] particularly as a resource to treat chronic lymphedema cases^[24] and for penile reconstruction,^[25] but full-thickness grafts give better cosmetic results without the need of expertise in the usage of dermatomes.

CONCLUSION

Circumcision is contraindicated in CP cases in children as it aggravates the primary condition and makes final

reconstruction more challenging. Alexander's distally based ventral preputial flap is a useful technical resource to treat MP cases. Free skin grafts and/or laterally based scrotal flaps may be used to cover the penis after release in severe cases of CP.

REFERENCES

1. Maizels M, Zaontz M, Donovan J, Bushnick PN, Firlit CF. Surgical correction of the buried penis: Description of a classification system and a technique to correct the disorder. *J Urol* 1986;136:268-71.
2. Liard A, Mitrofanoff P. La verge enfoui, une entité mal connue. *Arch Pediatr* 2002;9:1288-90.
3. Alexander A, Lorenzo AJ, Salle JL, Rode H. The ventral V-plasty: A simple procedure for the reconstruction of a congenital Megaprepuce. *J Pediatr Surg* 2010;45:1741-7.
4. Herndon CD, Casale AJ, Cain MP, Rinl RC. Long-term outcome of the surgical treatment of concealed penis. *J Urol* 2003;170:1695-7.
5. Lardellier-Reynaud F, Varlet F, François M, Mouriquand P. Concealed penis in the infant. *Prog Urol* 2011;21:642-50.
6. Cheng F, Yu WM, Zhang XB, Yang SX, Ge MH. Effects of buried penis on the structure and function of corpus cavernosum in a rat model. *Chin Med J (Engl)* 2010;123:1736-40.
7. Chuang J, Chen L, Shieh C, Lee S. Surgical correction of buried penis: A review of 60 cases. *J Pediatr Surg* 2001;36:426-9.
8. Pieretti RV, Goldstein AM, Pieretti R, Pieretti-Vanmarcke R. Late complications of newborn circumcision: A common and avoidable problem. *Pediatr Surg Int* 2010;26:515-8.
9. Bergeson PS, Hopkin RJ, Bailey Jr RB, Leigh C, Piatt JP. The inconspicuous penis. *Pediatrics* 1993;92:794-9.
10. Li Z, Wei D, Guizhen H, Miao Y, Lugang H. Pedicled skin flap of foreskin for phalloplasty in the management of completely concealed penis. *J Pediatr Surg* 2012;47:2289-93.
11. Brisson P, Patel H, Chan M, Feins N. Penoplasty for buried penis in children: Report of 50 cases. *J Pediatr Surg* 2001;36:421-5.
12. Williams CP, Richardson BG, Bukowski TP. Importance of identifying the inconspicuous penis: Prevention of circumcision complications. *Urology* 2000;56:140-3.
13. O'Brien A, Shapiro AM, Franck JD. Phimosis or congenital megaprepuce? *Br J Urol* 1994;73:719-20.
14. Rod J, Desmonts A, Petit T, Ravasse P. Congenital Megaprepuce: A 12 year experience (52 cases) of this specific form of buried penis. *J Pediatr Urol* 2013;9:784-8.
15. Chin T, Tsai H, Liu C, Wei C. Modifications of preputial unfurling to reduce postoperative edema in buried penis. *J Pediatr Urol* 2005;1:327-9.
16. Ruiz E, Vagni R, Apostolo C, Moldes J, Rodriguez H, Ormaechea M, *et al.* Simplified surgical approach to congenital Megaprepuce: Fixing, unfurling and tailoring revisited. *J Urol* 2001;185:2487-90.
17. Chu C, Chen Y, Diao G, Loh I, Chen K. Preputial flaps to correct buried penis. *Pediatr Surg Int* 2007;23:1119-21.
18. Summerton DJ, McNally J, Denny AJ, Malone PS. Congenital megaprepuce: An emerging condition – How to recognize and treat it. *BJU Int* 2000;86:519-22.
19. Perger L, Hanley RS, Feins NR. Penoplasty for buried penis in infants and children: A report of 100 cases. *Pediatr Surg Int* 2009;25:175-80.
20. Borsellino A, Spagnoli A, Vallasciani S, Martini L, Ferro F. Surgical approach to concealed penis: Technical refinements and outcome. *Urology* 2007;69:1195-8.
21. Sinha CK, Mushtag I. Penile resurfacing for denuded penis following circumcision. *Pediatr Surg Int* 2012;28:649-51.
22. Gillet MD, Rathbun SR, Husmann DA, Clay RP, Kramer SA. Split-thickness skin graft for the management of concealed penis. *J Urol* 2005;173:579-82.
23. Asimakopoulos AD, Iorio B, Vespasiani G, Cervelli V, Spera E. Autologous split-thickness skin graft for penile coverage in the treatment of buried (trapped) penis after radical circumcision. *BJU Int* 2012;110:602-6.
24. Morey AF, Meng MV, McAninch JW. Skin graft reconstruction of chronic genital lymphedema. *Urology* 1997;50:423-6.
25. Sivakumar B, Brown AA, Kangesu L. Circumcision in buried penis-a cautionary tale. *Ann R Coll Surg Engl* 2004;86:35-7.

How to cite this article: Jesus LE, Dekermacher S, Anderson KM. Severe forms of concealed penis without hypospadias: Surgical strategies. *Indian J Urol* 2015;31:344-8.

Source of Support: Nil, **Conflict of Interest:** None declared.