

An Arc Incision Surgical Approach in Congenital Megaprepuce

Hou-Wei Lin¹, Ling Zhang², Hong-Quan Geng¹, Xiao-Liang Fang¹, Guo-Feng Xu¹, Mao-Sheng Xu¹, Wei Cai¹

¹Department of Pediatric Urology, Xinhua Hospital, Shanghai 200092, China

²Department of Day Ward, Renji Hospital, Shanghai 200001, China

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INTRODUCTION

Congenital megaprepuce (CMP) is considered as a congenital penile malformation, which includes phimosis and severe ballooning of the redundant inner prepuce, conferring the typical aspect of concealed penis, in which the whole attachment is hidden within subcutaneous tissue.

Several approaches to concealed penis have been described in the literature, not all completely applicable to CMP, which is a condition that requires particular technique refinements to obtain the best functional and cosmetic results. Now, we provide an alternative and reproducible surgical procedure for correction, which has been used for more than 8 years by us with a satisfactory cosmetic appearance.

METHODS

The retrospective study was conducted by reviewing the records of all patients with CMP, who underwent surgical management at Pediatric Surgery Department of Shanghai Xinhua Hospital from January 2005 to January 2014, with local ethical board committee approval.

During the past 9 years, 32 uncircumcised male children, aged from 10 months to 3 years, were referred to our institution. All of them were diagnosed with CMP, presenting with micturition troubles (dysuria and/or urinary retention) and/or urinary tract infections. When voiding, all the patients presented with major ballooning of the inner prepuce [Figure 1a]. After compression or spontaneous urine excretion, the swelling disappeared. General anesthesia was employed intraoperatively, and prophylactic antibiotic (cefactor) was also given during urethral catheter drainage postoperatively. During the follow-up, secondary complications (such as redundant mucosa, secondary concealed penis, postsurgical penis curvature, urinary retention, and urinary infections) and cosmetic results were evaluated.

Procedure

The procedure started with the arc incision at the ventral prepuce [Figure 1b] followed by the progressive eversion of the inner prepuce. The circumferential incision was performed at 5 mm from the coronal sulcus. A longitudinal incision was made ventrally through the midline, and then the penis was degloved completely with perfect exposure of Buck's fascia. The unfurled inner layer of the prepuce was resected while carefully preserving the blood supply of the outer layer, essential for penile shaft coverage. The proximal dorsal outer prepuce was fixed to Buck's dorsal fascia with one polydioxanone II (PDSII) 5–0 stitch to reconstruct the penopubic angle while being aware of avoiding the neurovascular bundles. A small transversal incision was made ventrally at the junction between penile prepuce and scrotal foreskin. The subcutaneous tissue around the base of the penis was dissected, which made it easy for us to surround the base of penis by prepuce. Then we shifted the outer prepuce from body of penis to frenulum and the one from the base to the ventral side, respectively. A new penoscrotal angle was then achieved by a suture between Buck's fascia and dermis of the skin shaft. At last, the skin was completely closed with interrupted sutures by PDSII 6–0. The final scars were limited to a circular and a longitudinal ventral one [Figure 1c]. An 8Fr urinary catheter was removed 3 days after the operation. Postoperative pain control was achieved with luminal if necessary.

RESULTS

All patients presented with preputial micturition, micturition troubles, and also a striking penoscrotal swelling before the operation. This kind of discomfort and difficulty in voiding could be relieved by manual decompression of the swelling. No one had other malformation or associated pathology. Mean surgical time was about 50 minutes.

Postoperatively, transient preputial edema occurred in every patient and disappeared spontaneously between 3 and 5 months. No significant immediate complications

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Address for correspondence: Dr. Wei Cai,
Department of Pediatric Surgery, Xinhua Hospital, Shanghai 200092,
China E-Mail: caiw1978@163.com

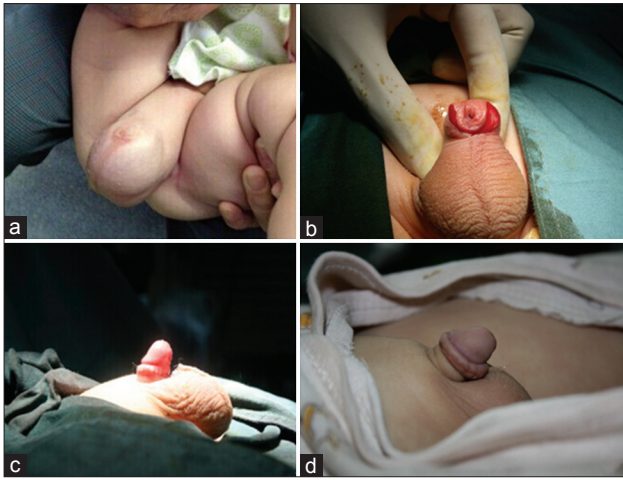


Figure 1: (a) Major ballooning of inner prepuce during voiding. (b) An arc incision at the ventral prepuce. (c) Postoperative appearance. (d) Appearance after 8 weeks follow-up.

such as hemorrhage, urinary retention, urinary fistula, preputial necrosis, or local infection were found. During the follow-up of 10 months to 5 years, there were no secondary complications or recurrences like secondary concealed penis, urinary retention, postoperative curvature, and preputial excess. All the patients had no chordee reported during penile morning erection. The surgeons and their parents were satisfied with their final cosmesis at the last follow-up [Figure 1d].

DISCUSSION

The initial description of CMP was reported by O'Brien *et al.* in 1994.^[1] The etiology is not very clear. However, a redundant inner prepuce over a prepuce ring, which is not retractable, probably plays an important role in leading to a ballooning of the foreskin while micturating. Failure of development in migrational planes of the fetus's external genitalia foreskin would be crucial.

Summerton *et al.*^[2] proposed that CMP should be a newly emerging and distinct condition, which cannot be easily missed or hidden. There was no evidence of spontaneous resolution with growth and development. So, early surgical correction was recommended. Our patients showed micturition troubles, urinary retention, or urinary tract infection, which made them uncomfortable. They underwent surgical intervention after diagnosis as soon as possible.

So far, there have been many techniques described for the correction of a buried penis, but only a few reports are specifically dedicated to the CMP.^[2-4] Considering that the outer lay of prepuce was relatively deficient, early circumcision should not be recommended to correct this abnormality, because standard circumcision would remove the skin that was required to resurface the shaft of the penis, which may result in poor cosmesis and a secondary procedure.

The surgical approach we described, not an original one, mainly included three principles: Removing the preputial

stenosis ring, widely reducing the inner prepuce, and anchoring the penile foreskin, which were somewhat similar with other techniques. Although Summerton *et al.*^[2] thought that phimosis played no role in the pathogenesis of megaprepuce, it was almost impossible for us to evert the whole inner lay to expose the glans without releasing the stenosis ring of prepuce. Unfurling the prepuce was the precondition for degloving operation of the penis, which also made it easy for us to widely reduce the inner prepuce in length and circumference. To our knowledge, inner prepuce tends to become edematous more easily than the outer one during and after operation. So keeping a long collar of inner prepuce would increase the risk of edema, which could cause an unesthetic preputial collar. In our group, 0.5 cm inner prepuce remained at coronary sulcus in every patient. The problem is how to resurface the penile shaft after widely removing the inner prepuce. Perger *et al.* believed that the outer prepuce could cover the penile shaft sufficiently.^[5] On account of this theory, we employed a ventral transversal incision at the penoscrotal junction followed by shifting the outer prepuce from body of penis to frenulum and moving the one from the base to the ventral side, respectively. Subsequently, the outer lay of prepuce was sufficient to resurface the penile shaft. Moreover, a ventral transversal incision at the penoscrotal junction could correct the webbed abnormality, which was helpful to reconstruct the penoscrotal angle. To our significant clinical experience, the appearance of the penis after operation was close to normal penis with this technique, which created good cosmetic results. During the follow-up, the scars, limited to a circumferential and a longitudinal ventral one, were quite invisible.

Nevertheless, there were also some limitations in this series. The follow-ups were not long enough for us to make any decisive conclusion. Of course, long-term outcomes with patients' satisfaction from a cosmetic and functional point of view will be needed to report confidently. Furthermore, this technique was not compared with other ones reported in the literatures.

In conclusion, our technique of correcting CMP does not require advanced reconstructive skill, which closely resembles a standard circumcision. It is indeed a feasible alternative surgical technique in CMP; of course, a larger study group with long-term follow-up is necessary to prove that. Considering that patients with CMP are relatively rare, we think multicenter corporations should be needed to cure the abnormality.

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