**Original**

### A Simple Modified Method to Correct Buried Penis in Boys

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**Key Words**
buried penis; circumcision; concealed penis; phimosis; preputial unfurling

**Background.** Buried penis is a result of penile skin deficiency and inadequate attachment of the skin to the Buck’s fascia. A modified prepuce unfurling technique and the results are reported.

**Methods.** Thirty-two boys with buried penis, aged 14 months to 12 years, underwent the surgical procedure. A circumferential incision is made at the junction of the outer and inner prepuce. The subcutaneous tissue is dissected from the inner prepuce and degloved from the Buck’s fascia, so that a thin inner prepuce can be sutured directly to Buck’s fascia. Reapproximation of the outer and the inner prepuce completes the procedure.

**Results.** Prolonged preputial edema was seen in two patients. No patient had skin necrosis. Most patients achieved satisfactory results.

**Conclusions.** This procedure unfurls the inner prepuce to cover the penile shaft. Ideal cosmetic results could be achieved in selected patients if some details of the procedure are emphasized.

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patients had obvious “balloning” phenomenon. Five patients had episodes of balanitis. The other patients were asymptomatic other than “small” genitalia.

**Procedures for the Group A patients**

The operation is performed under general anesthesia. The narrowest part of the prepuce will appear when the penile skin is pushed proximally (Fig. 1 and 2A). An incision is made at the ventral side of the narrowest part to open the phimosis (Fig. 2B). When the glans closes, a tight ring which may appear at the junction of the outer and the inner prepuce can be further released at ventral side. A circumcision incision is then made at the junction of the outer and the inner skin. Except for the first 10 patients, we dissect the tissue from the inner prepuce to reduce postoperative swelling. The subcutaneous tissue is also degloved from the Buck’s fascia to an extent where reliable skin fixation can be facilitated (Fig. 2C). The inner preputial skin, after adequate tailoring in the ventral side if needed, is sutured directly to Buck’s fascia in the proximal penile shaft using 5-0 polydioxanone (Ethicon). The outer and inner prepuce is then re-approximated in a circumferential way (Fig. 2D). A tight ring at the penile base should be avoided by dorsal or ventral slit. To minimize postoperative edema, a circumferential compressive dressing is applied and is removed on 3rd to 5th postoperative days.

**Procedures for the Group B patients**

The procedure is similar except that a part of the inner prepuce is circumcised if there is sufficient outer prepuce to cover the penile shaft. The extent of dissection required in this group is less than that of the Group A patients.

The first 7 patients were hospitalized and Foley catheters were placed after the surgery. The other 25 patients, who were operated in the later period, were managed in day-care surgery and not catheterized.

**Results**

All patients were followed for at least 2 months. The perfusion of the penile skin was good. Wound healing was uneventful in most patients. Postoperative edema and gross penile appearance were evaluated.

All patients had various degree of postoperative edema of inner prepuce. It was more severe and per-
sis tent in the Group A patients. In 21 patients, edema sub sided within one month after surgery. An other 9 patients re turn to normal within the second months. Two patients had edema longer than 2 months. One of them was a 3-year-old Group A patient; his swelling persisted up to 2.5 months after the operation. There was a tight preputial ring at the proximal penile shaft. During re-operation, the ring was divided, and edematous subcutaneous tissue was removed. Another boy was an 8-year-old Group B patient; excessive inner prepuce and subcutaneous tissue was the main cause of persistent edema. He was not re-operated. These 2 patients were the first few patients who received this procedure in our series. Prolonged edema was not seen after we refined the procedure.

Gross appearance was evaluated by parents and physicians subjectively after swelling sub sided. Two Group B patients were unsatisfactory because their penises were still not conspicuous after the operation. In most patients, improved or satisfactory cosmetic results were achieved after swelling diminished (Fig. 3).

**Discussion**

The exact incidence of buried penis is unknown but it is not a rare condition, especially in the Chinese. Several factors contribute to the manifestation of buried penis: a deficiency of penile shaft skin; a lack of fixation of the skin and dartos fascia to the Buck’s fascia at the penile base; and some times, too much prepubic fat. Buried penis may also result from inadequate circumcision or other genital surgery. Other than a “small” penis, many of these boys are asymptomatic. However, symptoms related to phimosis, such as “ballooning” phenomenon, pain ful voiding, urinary tract infection and urinary retention, are occasionally seen.

Many surgical procedures have been proposed to correct this problem. Preputial unfurling and various other ways of using preputial skin flaps to correct skin deficiency have been described. Some authors emphasize tacking suturing to restore adequate attachment between the penile skin and the Buck’s fascia. Skin graft is rarely needed in boys but may be helpful in some adult patients, especially those who have been previously circumcised. Some obese patients may need lipectomy. In our opinion, most of the buried penises can be managed with rather simple techniques.

Preputial unfurling proposed by Donahoe et al is an excellent procedure since it is comparatively simple and yields satisfactory cosmetic results, although some patients may have prolonged postoperative edema. In this original procedure, a circumferential incision is made at the penile base, and the inner and outer prepuce are unfurled and utilized to cover the penile shaft. Since blood supplies of the prepuce are terminal vessels arising proximally, a circumferential incision at the penile base will devascularize the whole penile skin, thus both the inner and outer prepuce can only be supplied by a limited amount of back flow from the corona to re-suit in ischemia and prolonged edema. In our modified procedure, the incision is made at the junction of inner and outer prepuce, therefore the vasculatures of the outer prepuce are preserved. The inner prepuce alone is enough to cover the penile shaft in most patients.

To establish adequate attachment between skin and Buck’s fascia, we also stress the importance of direct circumferential fixation of the inner prepuce to the Buck’s fascia. These stitches are easier to place and more secure than other procedures to anchor the skin to the penile base where much adipose tissue exists.

The major problem of this procedure is post operat-
tive edema of the inner prepuce. From our observations of the first few operated patients, persisted edema may be a result of a tight preputial ring that obstructed the penile veins and lymphatic return. A tight preputial ring can be avoided by incision, or resection if there is sufficient skin. Another cause is excessive inner prepuce and subcutaneous tissue with interrupted lymphatic flow. Thus, edema can be minimized by keeping just enough inner prepuce to cover the penile shaft and reduce subcutaneous tissue under the inner prepuce if possible. During the dissection of the subcutaneous tissue from the inner prepuce and the Buck’s fascia, the lymphatics are preserved in this modified procedure. In most of our patients, edema subsided within a month. Since more inner prepuce must be preserved in Group A patients, they usually had a more severe and longer duration of postoperative edema.

The necessity of surgery for buried penis is controversial. Although many are asymptomatic, buried penis may cause adverse psychological effects in boys and anxiety of parents. To determine whether surgical treatment is beneficial or not, the safety and the result of the techniques must be considered. Thus, if a simple surgical procedure is simple, not much different from a conventional circumcision, and is therefore ideal for selected patients with buried penis.

**References**