

Surgery Illustrated

Circumcision

Jack S. Elder

Department of Urology, Henry Ford Health System and Vattikuti Urology Institute, Detroit, Michigan, USA



PLANNING AND PREPARATION

In the USA, up to 85% of boys and men are circumcised, whereas in Europe circumcision is infrequent. The medical benefits of circumcision include a reduced risk of: UTI in infancy; phimosis; paraphimosis; balanoposthitis; and penile cancer (if circumcised in the neonatal period). In addition, there is evidence that circumcised men have a significantly lower risk of acquiring HIV and human papilloma virus. Circumcision is commonest in the neonate (primarily for cosmetic reasons), in older boys (cosmetic or medical reasons), and in adult men (medical reasons). In the newborn and infant, indications for circumcision include febrile UTI, congenital anomaly predisposing to UTI (i.e. hydronephrosis or VUR), megaprepuce, and secondary phimosis.

Contraindications to neonatal circumcision include hypospadias, chordee with no

hypospadias, webbed penis, microphallus, and hidden penis secondary to a large hydrocele or hernia. In older boys and adult men, indications include phimosis resistant to topical corticosteroid therapy, paraphimosis, recurrent balanoposthitis, frenular bleeding during intercourse, and, in selected populations, a desire to reduce the risk of sexually transmitted disease. In my opinion, circumcision for social reasons should be avoided in boys aged 3–10 years for ethical reasons, because they do not have a complete understanding of the procedure.

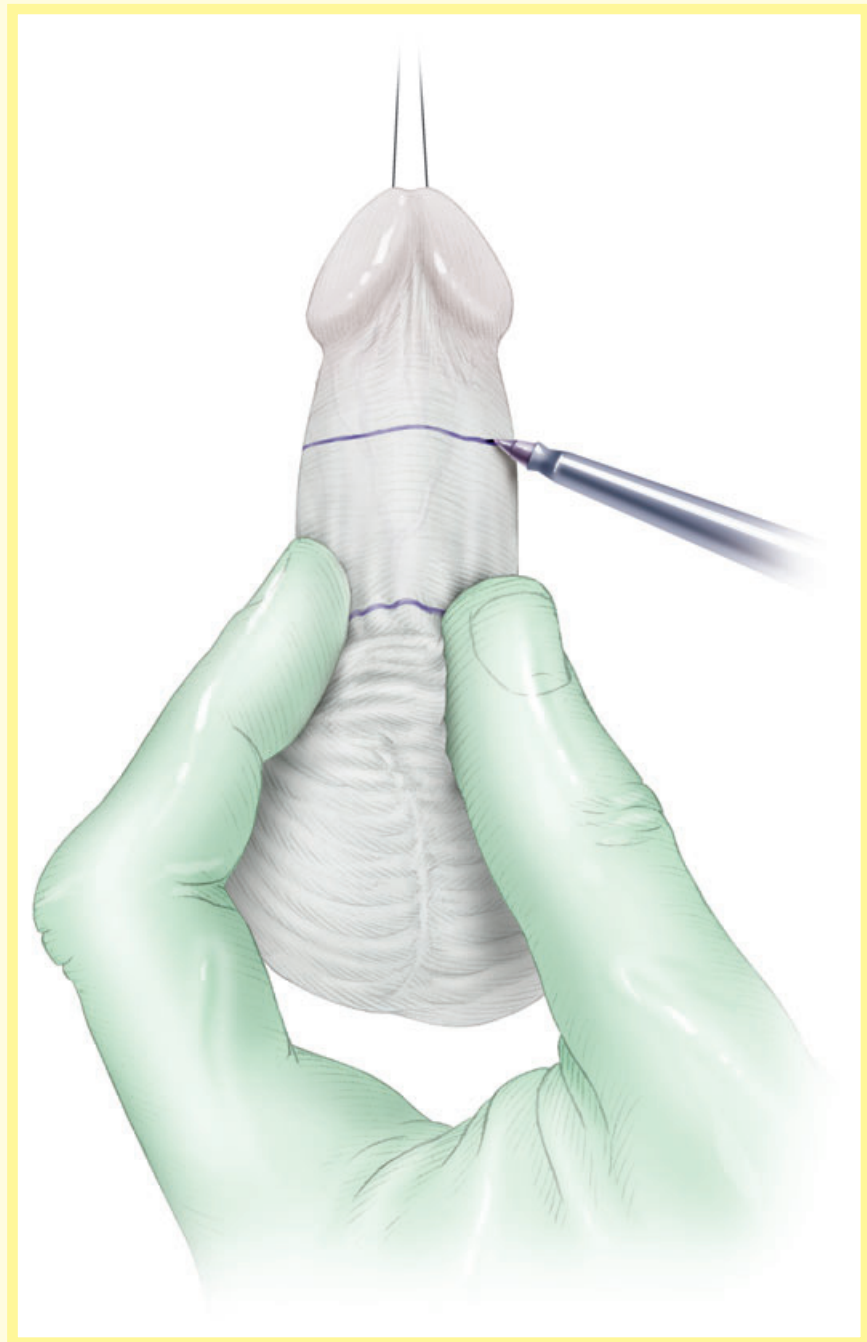
Candidates for circumcision should be medically cleared for the procedure, and the primary contraindication is a bleeding diathesis. The newborn usually is placed on a neonatal immobiliser (e.g. Circumstraint™ board, Olympic Medical Corporation, Seattle, WA, USA), with the legs secured and the arms free. It is helpful to have an assistant provide support and comfort to the baby. Older patients are circumcised while supine.

SURGICAL STEPS

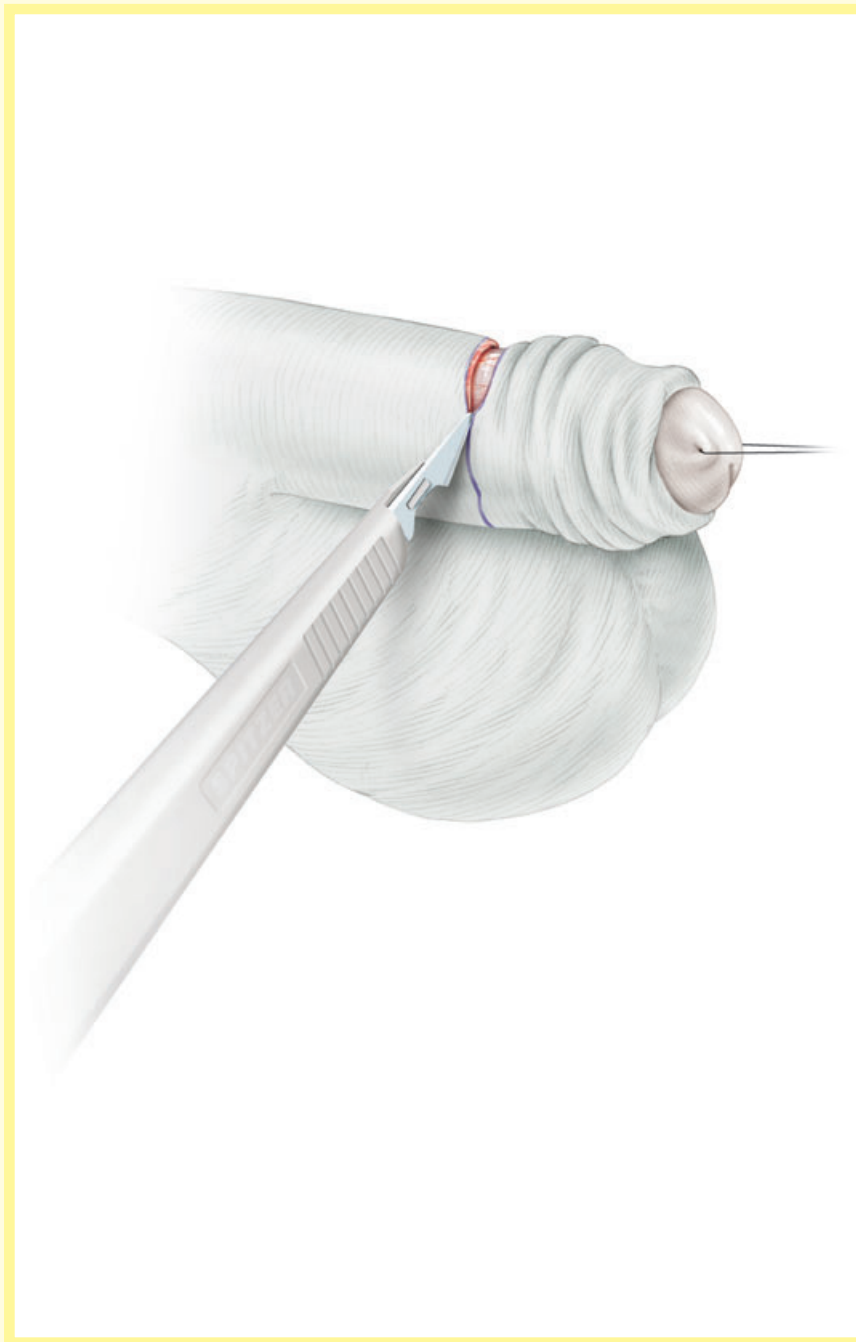
Figures 1–4

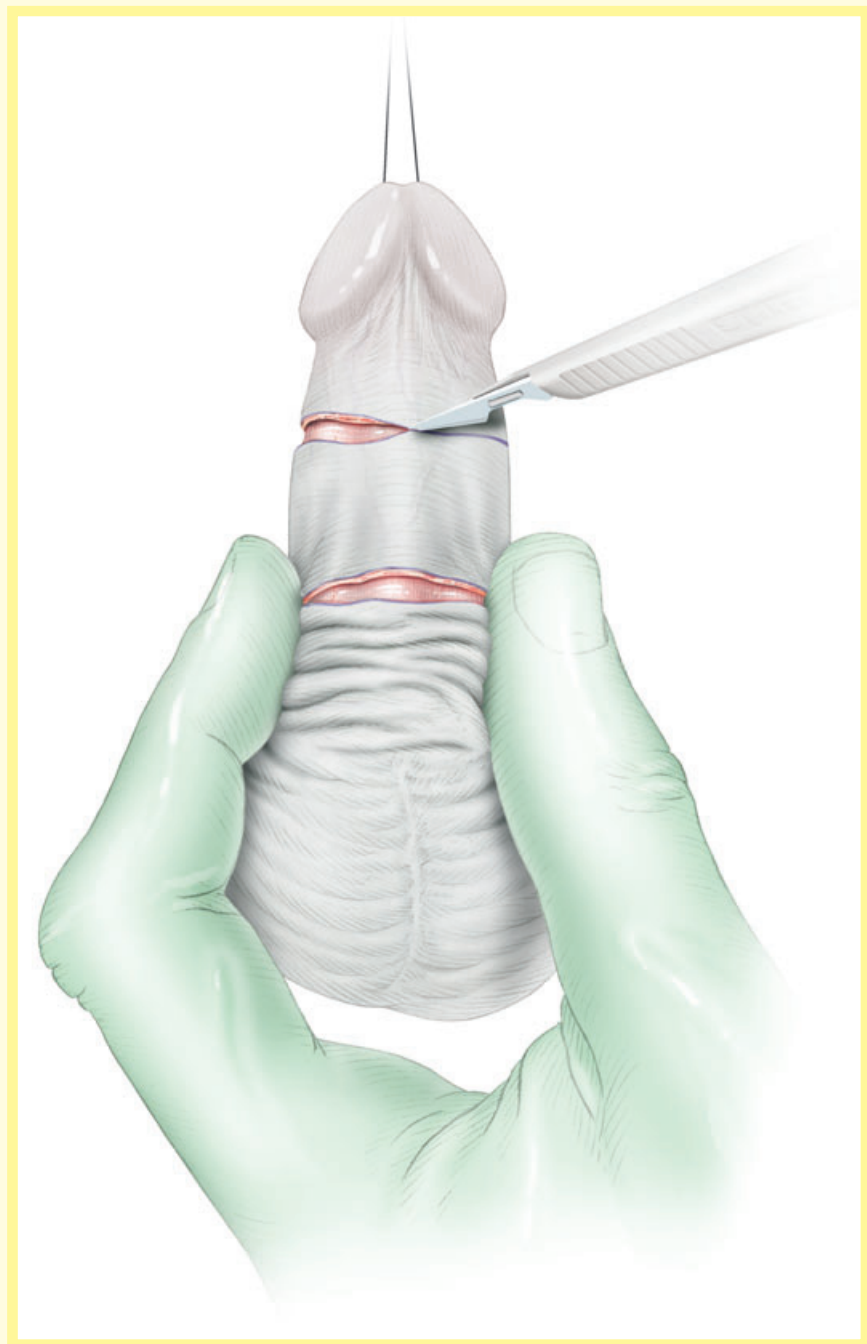
In older boys and adult men being circumcised, a monofilament traction suture on a cutting needle is placed transversely through the glans penis and clamped. An Allis clamp is placed on the drape cephalad to the penis and the traction suture can be wrapped around it. Generally a sleeve resection technique is used. A circumferential incision is made in the penile skin in the midportion of the penile shaft. Next, the foreskin is retracted and a second circumferential incision is made 1–3 cm proximal to the coronal sulcus, depending on penile length.





ELDER





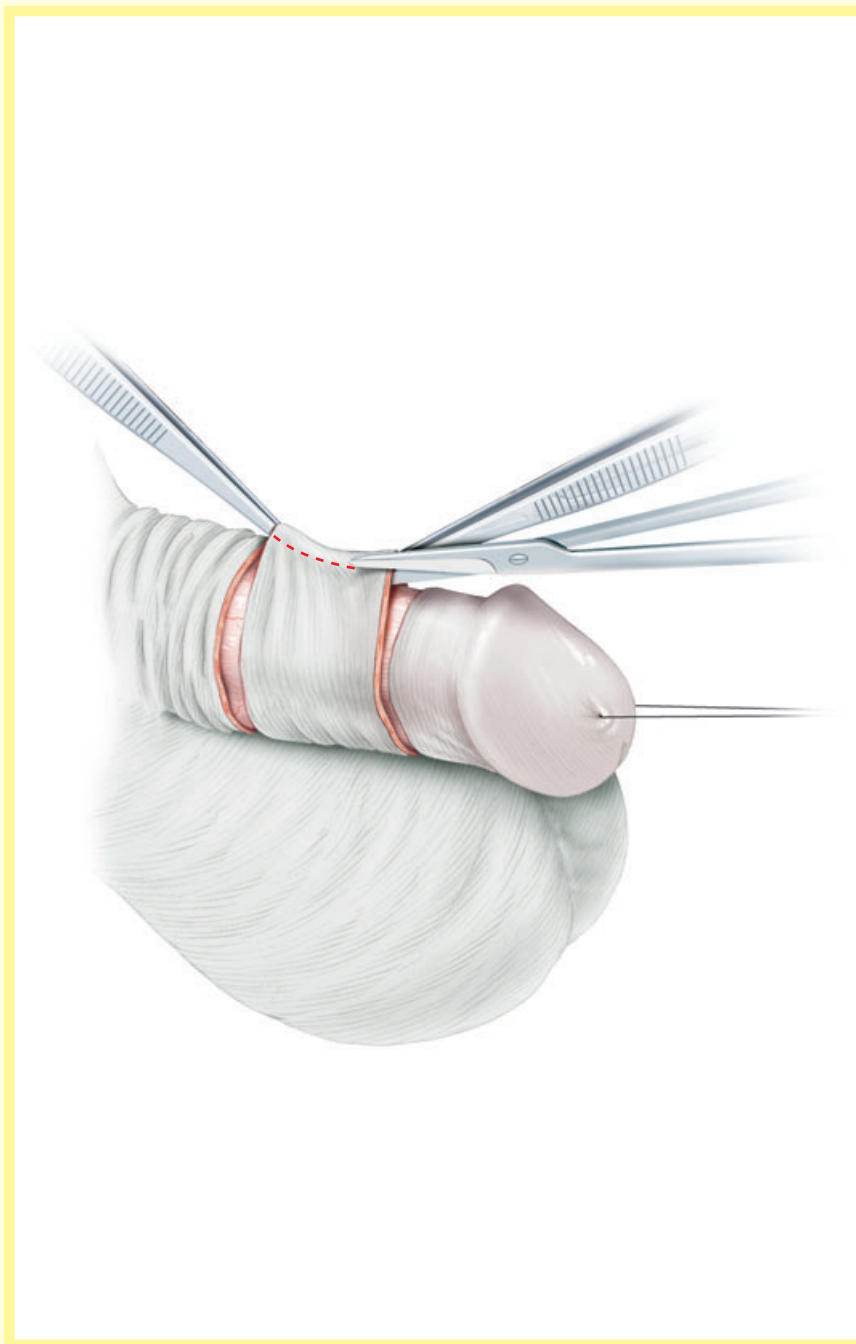
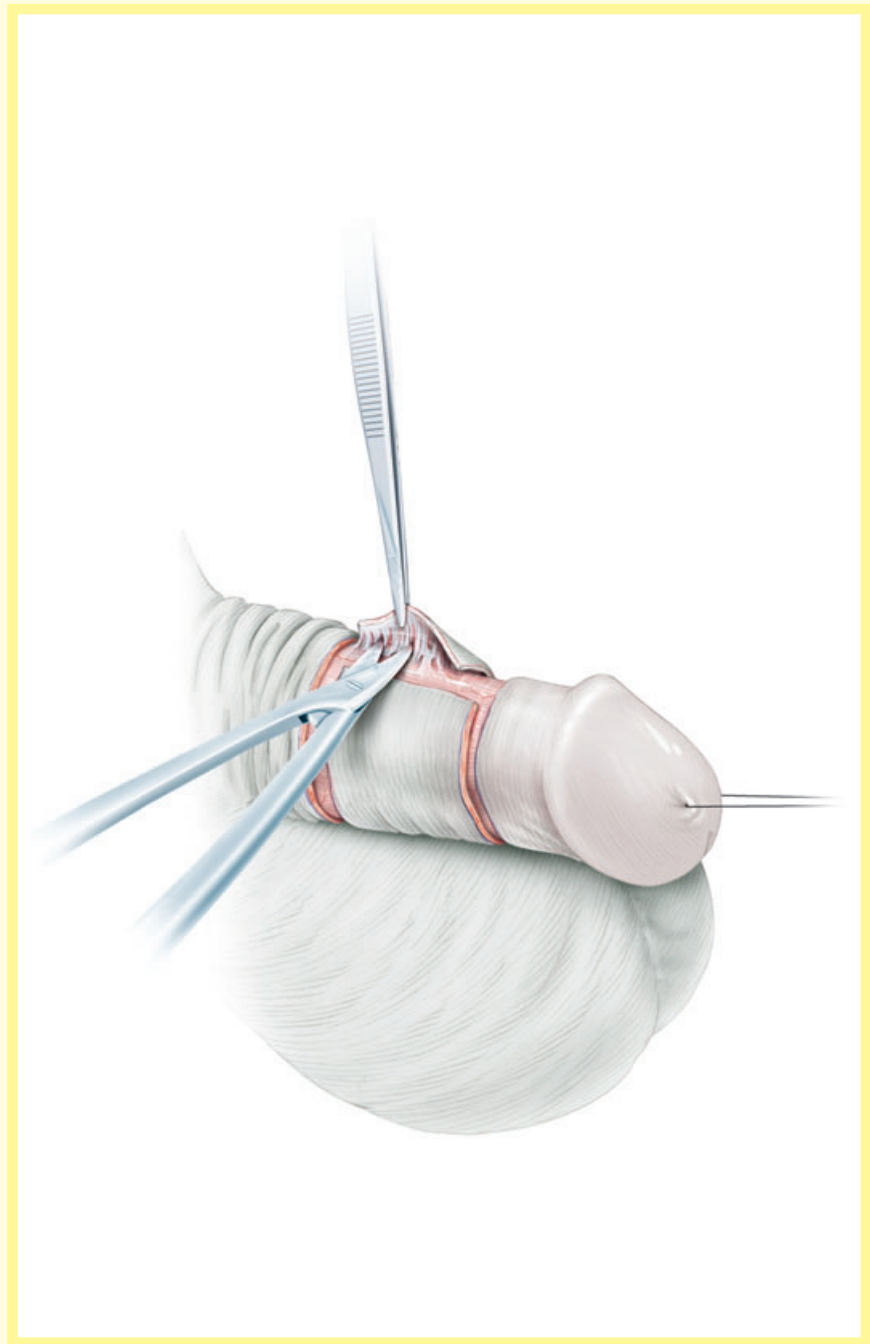


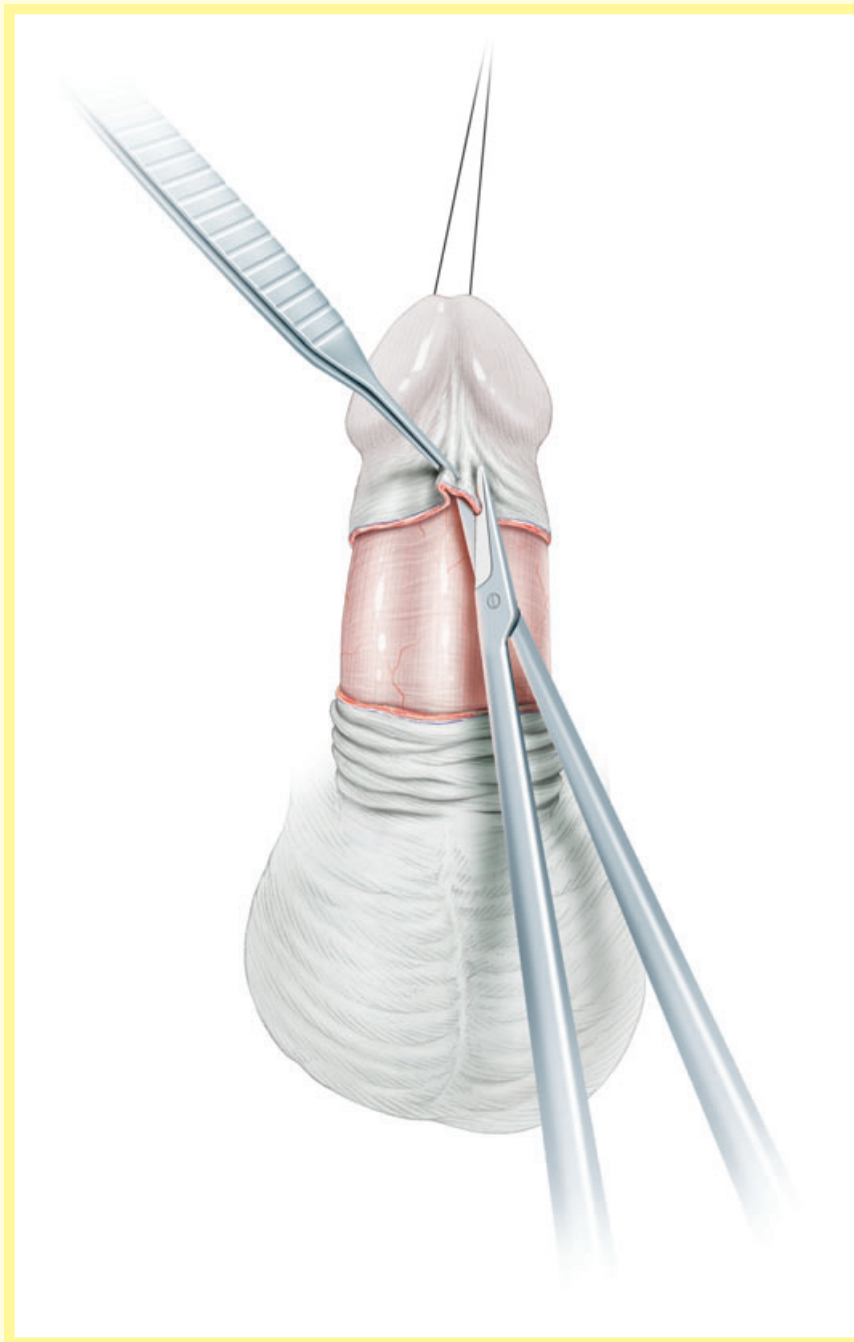
Figure 5

The two incisions are connected by cutting the dorsal penile skin in the midline.

Figure 6

The foreskin is excised circumferentially. Bleeding vessels are gently cauterized or tied off with 5-0 absorbable sutures.



**Figure 7**

Next, the redundant frenular tissue ventrally is excised.

Figure 8

The frenulum is closed with interrupted transverse sutures. The penile skin is then sutured to the distal mucosal skin with a stitch in the dorsal midline and two ventral stitches on each side of the frenulum. These sutures can be used for traction. The remaining penile skin is sutured to the distal mucosal skin with interrupted or running sutures.

There is a tendency for the skin edges to invert, which will lead to epithelial inclusion cysts. In addition, many surgeons approximate the skin tightly, which causes significant skin wrinkling. Chromic catgut has a tendency to leave suture tracts. Consequently, in young boys I recommend closing the skin with 5-0 fast-absorbing catgut. In older boys 4-0 or 3-0 polyglycolic acid on a small cutting needle should be used. If the skin edges are gently approximated, the resulting scar is a smooth line.





Figure 9

In the newborn there are three devices used for circumcision: the Gomco clamp, the Mogen clamp (used for ritual circumcision), and the Plastibell. The last is the author's preferred method, because it is versatile, leaves a favourable cosmetic result, and has a very low risk of complications such as bleeding. A penile ring block should be applied with 1% lidocaine and the anaesthetic should be massaged into the skin. In addition, having the baby suck on a pacifier dipped in a glucose solution is beneficial. The phimotic ring is stretched with a clamp and the foreskin is retracted slightly; a dorsal slit is made. A straight haemostat is placed on the dorsal prepuce at the 12 o'clock position and held in place for 10 s. The clamp is removed and the crushed line is incised. The foreskin is then retracted completely, exposing the glans. On occasion more than one dorsal slit is necessary. The frenulum is not incised. Next, an appropriate size Plastibell is obtained. The diameters include 1.1, 1.2, 1.3, 1.5 and 1.7 cm; in most newborns a 1.3-cm Plastibell is used.

Figure 10

The Plastibell is placed over the glans, and the foreskin is drawn up over the device. The Plastibell should fit loosely over the glans. There is a groove in the Plastibell. A heavy silk suture is then tied very tightly around the Plastibell in the groove. A surgeon's knot is tied and then it is advisable to bring the suture back to the opposite side of the Plastibell and tie a second set of knots there. The foreskin is excised, and the Plastibell remains in place, until it eventually falls off.

The Plastibell is versatile because it can be used for circumcision not only with a normal penis, but also in some boys with a minor penile anomaly, such as a webbed penis, or in the boy with a mild dorsal hood deformity of the foreskin with no chordee. The penile skin that is pulled up over the Plastibell can be adjusted so that after healing, the penile skin is evenly distributed around the penile shaft. After the first knot is tied down, the surgeon should check to be certain that the penile skin is evenly distributed around the penile shaft. If the skin is uneven, then the suture should be cut and the skin over the Plastibell should be adjusted and retied.



ELDER

POSTOPERATIVE CARE

It can be difficult to construct a dressing that will stay in place after circumcision and that is easy to remove. The purpose is to provide wound protection and gentle compression to prevent bleeding during erections. Studies from boys undergoing hypospadias repair have shown that a dressing does not lower the risk of complications. If the dressing is applied too tightly, then significant penile constriction during erection can occur. In general, I prefer an iodine-impregnated gauze dressing wrapped twice around the penile shaft. If the dressing is displaced within a few hours, antibiotic ointment should be applied regularly and application of a new dressing is unnecessary. If the dressing stays on, it should be removed 2 days after surgery. In boys with extensive filmy penile adhesions, the dressing tends to stick to the glans after circumcision and the gauze is difficult to remove; in this instance it is best to let it fall off after the glans has re-epithelialized, although that might take 1–2 weeks. In babies having a Plastibell circumcision, the plastic ring usually falls off in 3–10 days. Antibiotic ointment should be applied to the glans three or four times per day until healing is complete. The longer the ring stays in place, the greater the risk of inflammation and infection. Sometimes the plastic ring starts to fall off and simply dangles from the edge of the penis for a day or two. After the ring falls off, the penis appears relatively normal within 2–3 days.

Acetaminophen or ibuprofen is administered every 4–6 h for 48 h and subsequently as necessary. Boys aged >18 months are given a prescription for acetaminophen with codeine. Individuals with extensive penile adhesions tend to have much more severe and prolonged discomfort than those with no adhesions.

Bathing or showering is allowed after 48 h. In men having a circumcision, sexual intercourse

and masturbation should be avoided until the polyglycolic sutures have dissolved.

Patients are generally seen in the office 4–6 weeks after surgery, when the healing should be complete. In the newborn, if there are recurrent adhesions, these should be separated and the parents should be instructed to apply ointment for another week or two. In some newborns the penis retracts into the scrotum and the line of circumcision contracts, forming a cicatricial scar. Topical application of 0.1% triamcinolone or betamethasone will usually loosen the scar tissue.

FROM SURGEON TO SURGEON

Circumcision is generally a very straightforward procedure. The most difficult cases for circumcision include boys with a webbed penis, hidden penis, or those with a large hernia or hydrocele, in which the penis might be trapped.

Optical magnification is useful for careful tissue approximation. In young boys, Bishop-Harmon forceps or 0.5 tooth forceps are preferable over Adson forceps with teeth.

WORST CASE

The worst cases I have seen include a boy who was referred after circumcision using a YAG laser at another institution. The surgeon had not been properly trained in using the instrument as a contact laser, and the boy developed necrosis of the distal third of the glans penis. After reconstruction he had a satisfactory result. Another 'worst case' involved a boy who had a *bris* (ritual circumcision) with a Mogen clamp in which two-thirds of the glans was excised. In these cases, prompt reattachment of the glans usually gives a satisfactory result. Microscopic repair is unnecessary, and usually the urethra

heals satisfactorily and the glans usually survives. A third worst-case scenario includes the newborn in whom most or all of the penile skin is excised, leaving a completely denuded penile shaft. In my experience with several of these cases, there will be complete re-epithelialization of the penile shaft and a skin graft is unnecessary. Application of a xeroform or petrolatum gauze dressing is advised. Following a Plastibell circumcision, if the device is too small, it might be embedded in the glans, or if it is too large, it might migrate proximal to the glans. In both cases it needs to be removed. This can be done in the office. The Plastibell is so thick that it is difficult to cut even with heavy Mayo scissors. The best device to cut the Plastibell is the portable eye cautery. A mosquito clamp can be placed between the Plastibell and the penile skin

SINGLE MOST HELPFUL ASPECT

The most problematic aspect of circumcision is the extensive oozing after the incision, and the time it takes to achieve complete haemostasis. I have found that using monopolar diathermy with a Pena tip or micro-bovie tip on cutting current, or slightly blended with cautery to make the skin incisions, reduces bleeding by 90%. The assistant places a mosquito clamp into the subcutaneous plane where the incision is to be made, and the skin is incised under complete control. Although there is a theoretical risk of penile injury with monopolar cautery, reports of injury have occurred only with contact between the cautery and a metal clamp across the foreskin. I rarely use a scalpel for penile surgery, only the needle-point tip. The subcutaneous tissue is cut with cautery during removal of the foreskin. In addition, bleeding vessels are coagulated using electrocautery.

Correspondence: jack.elder@case.edu