

Childhood circumcision

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Ritual circumcision is an integral part of Judaism and Islam, and is practised by Aborigines and certain African tribes.

In the 1950s, about 24% of males underwent circumcision in the UK. However, over the past few decades, a better understanding of the physiology of the normal foreskin (as well as rationalization of healthcare provision) has resulted in a reduction in circumcision rates; about 6% of boys will undergo circumcision by the age of 15 years, with 35% of these procedures being performed in boys aged <6 years.

The normal foreskin

The function of the foreskin is uncertain, but protection of the underlying penile glans and meatus, as well as reduction of friction during sexual intercourse, have been proposed.

The normal foreskin shares a common epithelium with the penile glans at birth and is non-retractable. Over the next few years, the foreskin gradually separates, and 90% of foreskins are fully retractable by the age of three years. The normal non-retractable foreskin is termed 'physiological phimosis' (see below) and is not in itself an indication for circumcision. Before separation of the foreskin and glans, 'ballooning' of the foreskin during micturition is common and is also totally normal.

As the foreskin separates from the underlying penile glans, smegma may accumulate underneath the foreskin (particularly in the coronal groove) and may present as a white lump or 'pearl'. This may be confused with a dermoid cyst. Smegma is sterile and is released as dry, cheesy-white material.

Indications

Medical

Pathological phimosis is a non-retractile, scarred foreskin and is an indication for circumcision. The scarring may be a result of trauma or balanitis xerotica obliterans.

Balanitis xerotica obliterans is a condition of unknown cause that is thought to be the equivalent of lichen sclerosis in the female. It occurs in up to 1% of boys aged <17 years and rarely presents in boys aged <6 years. It results in a particularly severe form of foreskin scarring (Figure 1) which often extends into the urethral meatus and can even extend along the whole urethra. It is thought that balanoposthitis is a potentially pre-malignant condition.

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1 Balanitis xerotica obliterans.

Recurrent balanoposthitis – most cases of balanoposthitis are self-resolving or respond to simple topical or systemic antibiotics. In about 20% of cases, recurrent episodes occur and rarely it may be necessary to perform circumcision to prevent further episodes. Balanoposthitis has also been reported in circumcised boys.

Recurrent infections of the urinary tract: several studies have suggested that urinary tract infections are up to ten times more common in uncircumcised compared with circumcised infants. *Proteus mirabilis* is implicated in ascending infection. However, 100 circumcisions would be needed to prevent one urinary tract infection. A stronger argument for circumcision can be made in boys with recurrent infections in the presence of pre-existing urinary tract anomalies.

Paraphimosis occurs when the retracted foreskin becomes stuck behind the penile glans, thereby acting as a tight, constrictive band proximal to the coronal sulcus (Figure 2). This causes increasing preputial and glanular oedema, resulting in pain and potential ischaemia. In the acute phase, treatment usually consists of reducing the foreskin under local or general anaesthesia. If foreskin reduction is successful, the foreskin often becomes more retractile following an episode of paraphimosis. However, scarring may result and this (or recurrent paraphimosis) are indications for circumcision.

Delayed physiological phimosis: most cases of physiological phimosis resolve spontaneously or with conservative treatment such as:

- regular attempts at retraction
- topical corticosteroids
- the foreskin-sparing procedure of preputioplasty.

However, a number of cases persist beyond ten years of age and may require circumcision.

Non-medical

Religious: most ritual circumcisions are performed in neonates by non-medical practitioners. The British Association of Paediatric Surgeons guidelines recommend that circumcisions should be performed by individuals who can:

- perform the procedure



2 Paraphimosis.

- recognize comorbidity
- recognize complications and have adequate access to medical care if such complications arise.

The guidelines also state that circumcisions must be performed under sterile conditions with adequate analgesia (preferably with sedation or anaesthesia). In addition, the UK General Medical Council recommend that consent should be obtained from both parents.

Social: in Australia and USA, most circumcisions are performed on boys for non-religious 'social' reasons. One of the perceived advantages of circumcision is improved hygiene resulting in a reduction in venereal disease (particularly human papilloma virus) and a reduction in penile and cervical carcinoma.

Contraindications

The foreskin is used for surgical reconstruction of a number of congenital penile disorders, including:

- hypospadias
- epispadias
- chordee
- buried penis
- micropenis.

Circumcision is therefore contraindicated in these conditions. However, it has been reported that up to 36% of hypospadiac boys in USA have been circumcised before surgery for hypospadias.

Techniques

The aim of circumcision is to remove sufficient foreskin to expose the glans whilst ensuring that penile shaft skin is preserved.

Non-surgical

'Biblical method': the foreskin tip is excised with a 'knife'. Pressure is applied to achieve haemostasis.

The Mogen clamp is commonly used in Jewish ritual circumcisions. The foreskin is pulled through a slit in the clamp, which is then closed distal to the glans, allowing excess skin to be excised before the glans is uncovered. A dressing is then applied.

Gomco clamp: a steel bell (which must be the correct size) is placed over the glans after the foreskin has been fully retracted and the preputial adhesions have been released (this sometimes requires a dorsal slit). The foreskin is protracted over the steel bell and the Gomco clamp applied. The clamp crushes the foreskin circumferentially (enabling the redundant tissue to be excised with haemostasis) and is then removed.

Plastibell™ is a modification of the Gomco device. It is placed over the glans and the foreskin retracted back over it; it is essential that the correct size is used. A strong ligature is tied around the foreskin into the groove on the Plastibell™ and the redundant foreskin excised. After about 7–10 days, the foreskin edge necroses and separates from the ligature, and the Plastibell™ falls off.

Surgical

The principles of surgical circumcision are:

- retraction of the foreskin
- release of preputial adhesions
- excision of the foreskin leaving an adequate mucosal cuff
- meticulous haemostasis
- closure.

Guillotine method: the foreskin is released. Mosquito forceps are applied to the tip of the foreskin ventrally and dorsally and the foreskin protracted. A straight forcep is applied along the lower foreskin above the glans. Care must be taken to ensure that the glans is not caught within the forceps. The foreskin is excised by cutting above the forceps using a large scalpel blade. The inner mucosa is trimmed with scissors, leaving an adequate mucosal cuff. Haemostasis is secured with bipolar diathermy. Particular attention is paid to haemostasis at the frenulum and dorsal aspect. Only after haemostasis has been confirmed, circumferential interrupted sutures are inserted using fine, rapidly dissolvable suture (e.g. vicryl rapide). Some surgeons use tissue-glue instead of sutures for closure. Local anaesthetic gel and/or antibiotic ointment is applied. A dressing is not usually needed.

Freehand: the foreskin is excised ventrally with scissors after a dorsal slit has been made. The inner mucosa can be trimmed if required. Haemostasis and closure are performed as described above.

The sleeve technique involves two circular incisions being made with a scalpel, one in the mucosa proximal to the glans and the other on the shaft skin just below the level of the corona with the foreskin protracted. The resulting sleeve of foreskin is removed and haemostasis and closure achieved.

Complications

Most circumcisions are performed without complications.

Haemorrhage

Inadequate haemostasis during circumcision can result in post-operative haemorrhage. Primary haemorrhage can be treated by:

- application of pressure to the wound
- returning to theatre for further diathermy
- resuturing if a vessel is identified.

Secondary haemorrhage usually responds to pressure and may be associated with infection.

Infection

The incidence of infection is low and many surgeons routinely prescribe prophylactic topical antibiotic ointments. Established infection is treated by oral or systemic antibiotics (rarely).

Meatal stenosis

Meatal stenosis occurs when a urethral meatal ulcer heals with contraction of the scar or if recurrent balanitis xerotica obliterans involves the meatus.

Meatal stenosis may respond to topical corticosteroids, but meatal dilation or meatoplasty is often required. Urethral reconstruction may be necessary if balanitis xerotica obliterans has affected the whole urethra (rare).

Incorrect amount of skin excised

Too little or too much foreskin may be removed. Insufficient removal can result in a retracted 'penis' and a re-circumcision may be required; insufficient removal also often results in poor cosmetic effect. Excessive removal of foreskin can result in denuded penile skin and reconstruction may be necessary.

Penile injury

Amputation of all or part of the glans is rare, but occurs if the glans is caught in clamp devices or if devices (e.g. Plastibell™) are incorrectly sized. The use of monopolar diathermy or anaesthetic agents with adrenaline can also result in partial or total penile ablation. Reconstruction is attempted but sex reassignment has been necessary in rare cases.

Urethral injury

The penile urethra runs close to the ventral surface of the penile shaft. Injury to the urethra can occur when sutures on the ventral side are placed too deeply, and this can result in a urethral fistula.

Painful scarring

Painful scarring occurs when the sutures have been applied to the edge of the glans rather than the mucosal cuff. It causes pain during erection and sometimes the scars have to be released. ◆

FURTHER READING

British Association of Paediatric Surgeons (BAPS). Guidelines on circumcision. www.baps.org.uk

Cuckow P M. Circumcision. In: Stringer M D, Oldham K T, Mouriquand P D E, Howard E R (Editors). *Pediatric surgery and urology: long-term outcomes*. Philadelphia: W B Saunders, 1998.