Foreskin problems in boys

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The author reviews the common clinical conditions affecting the foreskin in boys, including phimosis, paraphimosis and inflammatory penile skin conditions, and discusses their management options.

Foreskin complaints and requests for circumcision are among the commonest reasons for referral to a paediatric surgeon/urologist, particularly in a district general hospital setting. However, in spite of being one of the earliest operations known to man, circumcision has invoked more controversy than any other surgical procedure in history.

Conversely, many parents and patients have firmly held beliefs, religious or otherwise, in favour of circumcision. It is therefore vital that all healthcare professionals dealing with foreskin problems and requests for circumcision are aware of the medical indications for circumcision and alternative options for dealing with foreskin problems, to be able to manage these consultations appropriately.

ANATOMY AND NORMAL DEVELOPMENT OF THE FORESKIN

The foreskin (prepuce) is the retractile covering of the glans penis. It develops at approximately eight to nine weeks’ gestation and provides some protection to the underlying immature glans. Initially, the epithelial linings of the foreskin and glans are in continuity and ‘fused’ by preputial adhesions, such that it is a normal stage in preputial development for the foreskin to be non-retractile.

At three years of age, up to 10 per cent of boys will have completely non-retractile foreskins, and a further proportion will have only partially retractable foreskins as a result of persistent inner preputial adhesions, which are present in almost 75 per cent of five-year-olds.1,2 Over time, the foreskin gradually becomes retractile secondary to intermittent erections and keratinisation of the inner epithelium. Further to Gairdner’s original work,2 a more recent Danish study has suggested that the mean age of first natural foreskin retraction occurs as late as 10.4 years.3 Indeed, in some boys, a non-retractile foreskin may persist into teenage years.
CLINICAL CONDITIONS AFFECTING THE FORESKIN

Various conditions can affect the foreskin of a child, most of which are benign, but may cause patients and/or their parents to seek medical attention.

Phimosis

Phimosis is a condition in which the foreskin cannot be retracted over the glans. In most cases this is physiological as a result of the reasons mentioned above, and the patient/parents should simply be reassured that things will improve naturally with time. For those keen for more active management, a short course (six to eight weeks) of topical corticosteroid (eg 0.05 per cent betamethasone) applied directly to the preputial outlet twice daily can speed up the natural breakdown of preputial adhesions.

There is no evidence to suggest that having a physiological phimosis leads to a pathological one at any stage. However, boys and their parents should be warned against forcefully trying to retract the foreskin while it is still physiologically non-retractile, as this can create microtears at the preputial orifice, counterproductively leading to formation of scar tissue.

In pathological phimosis, conservative approaches are unlikely to suffice and surgical intervention is usually required. Differentiating between physiological and pathological phimosis therefore remains important. The distinction can usually be made on inspection of the foreskin upon gentle retraction; in physiological phimosis the inner preputial layer will be healthy and pink, and pout or ‘flower’ outwards (Figure 1), whereas in pathological phimosis the preputial orifice appears as a white, scarred ring (Figure 2). This scarring is usually caused by balanitis xerotica obliterans (BXO; also known as penile lichen sclerosus); a chronic scarring condition appearing as itchy or sore areas of white discolouration in the genital skin, which may also affect the glans and urethra.

The true incidence of BXO is unknown, but its presence has been reported in 17–53 per cent of foreskins sent for histological analysis after paediatric circumcisions performed for phimosis. It is rare before the age of five years, with a peak incidence occurring at around 10 years.

Smegma and preputial ‘pearls’

Smegma is a harmless substance consisting of shed skin cells and sebaceous secretions. If it becomes trapped beneath the foreskin, it may aggregate to form ‘pearls’ at the level of the coronal sulcus, proximal to the glans. These pearls will eventually extrude and disappear once the foreskin becomes more retractile.

Balanoposthitis and balanitis

Infection and inflammation of the foreskin is a common problem among uncircumcised boys, particularly in those with a non- or partially retractile foreskin. Balanoposthitis is diagnosed by the presence of erythema and oedema of the foreskin and glans. The term ‘balanitis’ is used when the glans is affected in isolation. Both conditions are frequently accompanied by purulent discharge, which should be swabbed and sent for culture (Figure 3). Affected boys may also complain of dysuria.

No single pathogen is involved and the condition usually responds to a short course of topical antibiotic cream such as Fucidin. In cases where there is balanoposthitis in association with a phimotic foreskin, Fucidin H (a combination of fusidic acid and 1 per cent hydrocortisone cream) can be tried. The administration of oral antibiotics should be reserved for boys who are systemically unwell with foreskin infection. Less commonly, infection may be candidal in origin, in which case a topical antifungal cream such as 1 per cent clotrimazole can be prescribed.

In many cases, particularly among boys still in nappies, inflammation of the prepuce is not caused by infection, but is a form of...
ammonia dermatitis akin to nappy rash of the buttocks. It is important to distinguish between inflammation caused by infection and that caused by ammoniacal irritation, as inflammation of the glans will be exacerbated if a circumcision is performed in the latter, and may lead to the development of a meatal ulcer, which can be difficult to treat.

**Paraphimosis**
Paraphimosis is the inability to pull forward a retracted foreskin. It usually occurs when the foreskin has been left retracted for an extended period, such as after voiding or bathing, leading to swelling, which causes the foreskin to become painfully stuck behind the glans. Paraphimosis constitutes a medical emergency, and can be associated with considerable pain and swelling. It requires prompt manual reduction but is not a definite indication for circumcision unless it becomes a recurrent issue.

**Megaprepuce**
This rare congenital condition is characterised by excessive inner preputial skin in combination with a phimotic ring. It classically presents as a ‘ballooning scrotal mass’ on voiding (caused by the accumulation of urine underneath a baggy foreskin), which is drained by compression of the scrotum.

**Hooded foreskin**
This condition is usually associated with hypospadias, and is caused by deficient foreskin development on the ventral side of the penis, creating a hood of foreskin dorsally.

**DISEASES ASSOCIATED WITH THE PRESENCE OF A FORESKIN**
Some parents will approach medical practitioners requesting circumcision on the grounds that they have heard that it prevents the acquisition of diseases associated with the presence of a foreskin and is more hygienic. Certainly, there is randomised control trial evidence from three studies carried out in Africa that circumcision can reduce the risk of HIV acquisition in heterosexual males. However, there is no evidence to support an increased risk of penile cancer or cervical cancer with uncircumcised males.

Circumcision to prevent urinary tract infection (UTI) is also unproven, except in boys with abnormal upper tracts. Furthermore, a randomised control trial looking at boys undergoing anti-reflux surgery has suggested that even in this group, circumcision may not confer any additional protection against UTI once the underlying upper tract pathology is treated.

**KEY POINTS**
- Phimosis is a normal stage in preputial development; in most cases it does not require further medical or surgical intervention
- Parents/boys should leave the foreskin alone until it demonstrates an ability to retract
- Once the foreskin is mobile, it can be gently retracted during voiding and bathing to prevent the accumulation of urine and secretions beneath the foreskin, which can lead to recurrent glans/foreskin infections and/or inflammation; children should be taught to do this themselves as they will normally stop if they experience any discomfort
- Forcible retraction of the foreskin should be discouraged, as this risks the development of microtears at the preputial orifice and scar tissue formation, which might eventually form a fibrotic ring leading to pathological phimosis

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**Box 1. Medical indications for circumcision**

**ABSOLUTE**
- Balanitis xerotica obliterans and/or a scarred foreskin

**RELATIVE**
- Recurrent troublesome balanoposthitis
- Prevention of urinary tract infections in boys with vesicoureteric reflux
- Recurrent paraphimosis
- Abnormally formed foreskin, e.g., hooded foreskin
- Painful erections secondary to a tight foreskin

Box 1 outlines the absolute and relative medical indications for circumcision.

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**REFERENCES**
The urologist's comment

CULLEY C. CARSON

The cases of hypogonadism that Geoff Hackett describes are as common on the US side of the Atlantic. Indeed, many primary care practitioners do not suspect low testosterone in the patients most likely to suffer from the symptoms of low testosterone, or they are reluctant to treat these men for fear of side-effects such as prostate changes or even prostate cancer.

It is important to the health of the ageing male to have high suspicion for low testosterone, especially in those at high risk. The cases presented highlight the association of low testosterone in more than one-third of diabetics. Low testosterone is also prevalent in men taking opioid analgesics, and in those with ED, Peyronie's disease, metabolic syndrome and sleep apnoea. Identifying and treating these men is essential to their health and facilitates insulin sensitivity, vascular health, urinary symptoms and bone health without the risk for prostate cancer that is the conventional wisdom.

Indeed, as a urologist, I am frequently asked by my primary care colleagues about prostate health and testosterone normalisation. We, as specialists in men’s health, must be more effective in combating the myth of testosterone replacement causing prostate cancer as it is a common untruth. Men who are appropriately diagnosed and treated for low testosterone levels with symptoms of hypogonadism are among the most grateful of patients, and the long-term benefits to these men is significant.