

Male circumcision – when is it justified?

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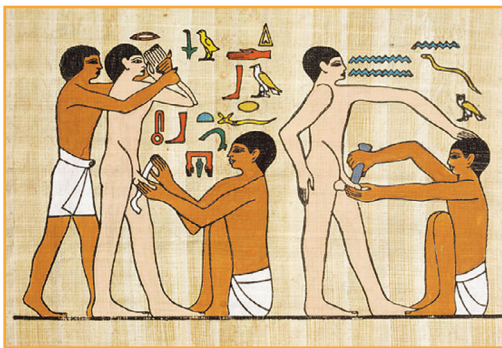


Figure 1. Carvings found on 'The physician's tomb' at Saqqara, Egypt. Photo: Art Archive/Ragab Papyrus Institute Cairo/Dagli Orti

Although the indications for male adult circumcision are less common and less contentious than those for infant circumcision, they are no less important. The authors provide an anatomical and functional overview of the prepuce, and review the common indications for adult circumcision.

Male circumcision may be considered one of the first elective surgical procedures reported in any literature. Drawings with hieroglyphics found in the Ancient Egyptian temple at Saqqara depicting the earliest techniques of male circumcision are thought to date back to roughly 2600–2400 BC (Figure 1).¹

It is in no small part the historical, cultural and religious significance of male circumcision that contributes to current controversies surrounding the practice. In Germany, Muslims and Jews have united in protest against what they view as an attack on the tradition of paediatric male circumcision from the judiciary, which has placed restrictions on the practice in Berlin, and which has also branded it the 'illegal infliction of bodily harm' in Cologne.²

On the contrary, in the USA, where half of the male population is circumcised, the American Academy of Pediatrics, revising its policy for the first time in 13 years, has

recently ruled in favour of infant circumcision.³ Highlighting reductions in childhood urinary tract infections, and a lifetime reduction in the risk of penile cancer, the Academy has changed its stance and now recommends that the procedure should be covered by routine medical insurance.

Furthermore, the matter of prevention of HIV and human papillomavirus infection by circumcision is another aspect of the debate that continues to court controversy. Epidemiologists and doctors try to navigate social and religious sensitivities while informing health policy on sound evidence, not always easily achieved.^{4,5}

Although it is beyond the scope of this article to comment on infant or pubescent circumcision for religious or social purposes, in view of the current controversy surrounding the practice on the whole, it is timely and appropriate to give an overview of male circumcision in adults and when it is justified.

THE FORESKIN: ANATOMY AND FUNCTION

The male foreskin, also known as the penile prepuce, is an anatomical structure of the male external genitalia (which has its female counterpart in the form of the clitoral prepuce or hood) found in all human and non-human primates. It has been present in primates and mammals for at least 65 million years.⁶

The male foreskin forms the normal anatomical covering of the glans of the penis. The outer epithelium has the protective function of internalising the glans and the urethral meatus, thus

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reducing exposure to irritants and friction.⁷ In this capacity, and because the prepuce is comprised of specialised, junctional mucocutaneous tissue, the foreskin is frequently compared to the eyelids, the lips, the anus and the labia minora in structure and function.

The space between the inner surface of the prepuce and the glans of the penis (the preputial sac) is maintained by secretions from the prostate and the seminal vesicles, the urethral glands of Littre and the complex vasculature of the penile mucosa.⁸ Commensal organisms present in the preputial sac include enterococci, *Corynebacterium*, Gram-negative anaerobes and *Mycobacterium smegma*. This delicate commensal microenvironment provides physical, physiological and immunological protection for the glans and the external urethral orifice.⁹ The male prepuce also has a role in sexual intercourse, providing adequate mucosa to cover the entire penis during erection and serving as an erogenous sensory tissue.

In the majority of infants at birth, the foreskin has not yet developed its structural independence from the glans of the penis itself. Thus the infant prepuce is more commonly non-retractile.¹⁰ The fused mucosa of the glans penis and the inner lining of the prepuce separate over years as a spontaneous biological process. At the age of seven years, 23 per cent of boys have a non-retractile prepuce, but by the age of 17 this has decreased to 5 per cent of boys.¹¹ Ignorance of the natural non-retractability or 'physiologic phimosis' of the male prepuce in infancy among doctors has, in the past, led to the unnecessary surgical treatment of normal anatomy in many boys. Wright pens jocularly that 'the fortunate foreskin of an infant boy will usually be left well alone by everyone but its owner'.¹²

With regards to the sensory innervation of the prepuce, in stark contrast to the glans of the penis, which has very poor

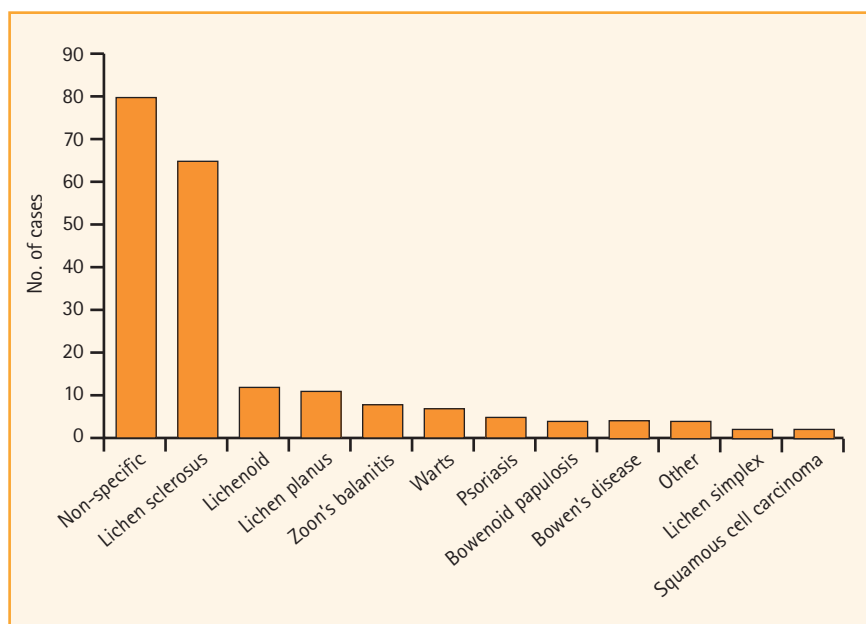


Figure 2. Preputial histological diagnosis of a series of 200 cases of circumcision

fine-touch discrimination, the prepuce is very richly populated with encapsulated somatosensory receptors for fine touch. This contrast in sensitivity between the adjacent structures of the male external genitalia is part of the normal complement of penile erogenous tissue.¹³

INDICATIONS FOR CIRCUMCISION

Adult circumcision is performed much less frequently than neonatal and childhood circumcision. Moreover, adult circumcision is much more commonly performed for health rather than societal reasons.

Anaesthesia can be accomplished using a dorsal penile nerve block, by injecting a local anaesthetic solution deep into Buck's fascia where the left and right dorsal penile nerves emerge from the pubic bone. Local ring block can also be administered to supplement and guarantee adequate analgesia by injecting anaesthetic solution circumferentially around the base of the shaft of the penis. The aforementioned techniques can also be combined with general or regional/spinal/epidural anaesthesia.

Therapeutic male circumcision should be undertaken only after medical interventions

have been unsuccessful or are not applicable. The preputial histological diagnosis in a series of 200 cases of circumcision for 'dysfunctional foreskin'⁹ over a two-year period by a single surgeon (MDD) is demonstrated in Figure 2.

Phimosis

Phimosis is a common condition in which the prepuce cannot be retracted to expose the entire glans of the penis. Phimosis occurs naturally in infancy and childhood, but it can also occur pathologically ('true' phimosis). Symptoms of adult phimosis can include male dyspareunia¹⁴ (painful intercourse) and, in more severe cases, difficulty urinating.

Pathologic phimosis often results from inflammatory or traumatic injury to the prepuce resulting in an acquired inelastic scar or fibrous ring around the preputial orifice that precludes retraction.¹⁵ This condition is often a sequel of infectious balanoposthitis or other preputial dermatopathologies such as lichen sclerosis (Figure 3).

An uncommon cause of a pathologic phimosis in adult men is neoplasia of the

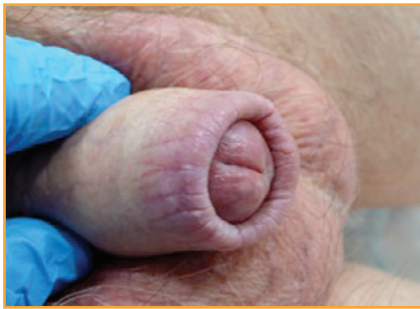


Figure 3. Phimosis likely secondary to lichen sclerosus

glans penis, which precludes retraction by widening the diameter over which the prepuce must stretch.

Topical steroids can be used in pathologic phimosis with some success, though most trials have been conducted in paediatric populations. When phimosis is refractory to topical steroids or when side-effects render the option intolerable, circumcision is the definitive treatment.¹⁶ The non-retractile foreskin is probably the most common indication for adult circumcision.

Paraphimosis

Paraphimosis is a condition in which the foreskin is left retracted because of entrapment of the tight prepuce proximal to the coronal sulcus. The glans engorges and the prepuce becomes oedematous as a result of lymphatic and venous congestion. Paraphimosis can present as a penile emergency if preputial tightness, preventing blood flow distally to the glans, progresses to ischaemia and necrosis of the glans.¹⁷ Careful manual compression of the glans and simultaneous gentle reduction of the foreskin should be the



Figure 4. Penile lichen planus with adhesions

first line of management. If reduction cannot be achieved in this manner, operative intervention such as the dorsal slit may be required, which in turn necessitates later circumcision.¹⁸

Balanoposthitis

Balanitis refers to inflammation of the glans of the penis, posthitis to inflammation of the inner layer of the prepuce. They commonly occur together, hence the term balanoposthitis. Symptoms include rash, irritation and male dyspareunia – those of a dysfunctional foreskin.

There are multiple causes of balanoposthitis: the commonest are lichen sclerosus, lichen planus (Figure 4),¹⁹ Zoon's balanitis (Figure 5) and non-specific lichenoid inflammation. *Candida albicans* infection (thrush) in the healthy adult male is extremely rare. A detailed description of these conditions is beyond the scope of this article, but a diagnosis can almost always be established by careful history taking and examination of both the penis and extragenital sites. Biopsy of the prepuce or the penis is seldom indicated.^{20,21}

Failure of medical treatment (mostly the use of soap-free washing and topical steroids) to cure the symptoms of the condition is an indication for circumcision. Lesser surgical procedures such as frenuloplasty, dorsal slit or preputioplasty are seldom indicated in the majority of men with balanoposthitis.

Penile malignancy or premalignant changes

Diagnosis of penile carcinoma *in situ* (CIS) requires a high index of suspicion. Bowenoid papulosis, Bowen's disease and erythroplasia of Queyrat refer to different clinical presentations that are grouped together as premalignant conditions (CIS). Such conditions can present with a dysfunctional foreskin, typically local pain or itch, or they may be asymptomatic and found incidentally following histopathologic examination of the prepuce after circumcision for other reasons.



Figure 5. Zoonoid balanitis

Severe dysplasia/penile CIS of unkeratinised penile epithelium is conventionally called erythroplasia of Queyrat. Lesions on the keratinised shaft or prepuce are referred to as Bowen's disease. Circumcision plays a central role in management as it combines the benefits of excising a preputial lesion, eliminating a suitable environment for human papillomavirus infection, and facilitates surveillance and self-examination in the future.^{22,23}

Squamous cell carcinoma

Penile squamous cell carcinoma (SCC) is a rare disease that can occur on any part of the penis, including the prepuce. There is a host of treatment options including radiotherapy, medical therapies (local and systemic), and surgery alone or in combination. Circumcision may be indicated in cases of SCC on the foreskin refractory to medical treatments such as 5-fluorouracil and imiquimod. In recent years, surgical advances have allowed men who present with more advanced malignancy to undergo organ-preserving operations and subsequent glans-resurfacing procedures.²⁴ Lastly, circumcision may have a role in rare conditions such as idiopathic penile oedema when medical intervention has been unsuccessful and the patient is prepared for surgery.²⁵

Psoriasis and eczema

Psoriasis and eczema are common dermatoses that may present on almost

any area of the body. If genital psoriasis is suspected, a detailed inspection of the rest of the body, with particular attention to the scalp, nails and perineal regions might help to clinch the diagnosis.

Both the prepuce and the glans can be affected by psoriasis. Eczema (dermatitis) may be endogenous (eg atopic or seborrhoeic) or exogenous, commonly irritant or allergic dermatitis. These occur as a result of the irritant effects of overwashing or sensitisation to the constituents of toiletries and medicaments. Symptoms of psoriasis and eczema include itch, rash and male dyspareunia. Circumcision is rarely indicated for male genital psoriasis and eczema.

DISCUSSION

In summary, male circumcision is a surgical procedure with a very long past and a controversial present. Current controversies centre largely upon the arguments for and against infant circumcision. The indications for male adult circumcision are less common and less contentious; however, they are no less important.

There are a number of conditions that cause dysfunction of the prepuce in relation to its neighbour the glans, therefore a careful history and examination is integral to formulating a diagnosis and targeting treatment appropriately. Largely, the justification for male circumcision is a dysfunctional foreskin where medical management has been unsuccessful or neoplastic changes have supervened.

Declaration of interests: none declared.

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