SEXUAL HEALTH

Phimosis: Pathophysiology, Clinical Management, and Psychosocial Considerations

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Phimosis refers to a condition in which the foreskin cannot be drawn back over the glans penis. This presentation may be physiological in early childhood, where natural adhesions are common, or pathological when fibrosis or inflammation restricts retraction later in life. Depending on severity, individuals may experience difficulty with urination, discomfort during sexual activity, or emotional distress related to body image and intimacy. This review integrates epidemiology, mechanisms, diagnostic strategy, and tiered management, emphasising patient-centred care and psychosocial well-being. Future perspectives on regenerative therapies and telemedicine are discussed. Phimosis is characterised by a nonretractile foreskin that resists easy manual retraction over the glans penis (Franco & Robinson, 2012). Although physiologic phimosis in boys resolves spontaneously, the chronic or acquired types can cause hygiene difficulties, balanitis, obstructive micturition, painful sex, and reduced self esteem (Yang et al., 2020). Prevalence of congenital phimosis reported drops from about 30% at birth to less than 1% by adulthood, with acquired phimosis occurring in up to 3% of men globally (Franco & Robinson, 2012; Yang et al., 2020). All aspects of anatomical, inflammatory, and psychosocial factors must be understood comprehensively to direct successful, minimally invasive treatment and maximise quality of life.

Classification and Epidemiology: Phimosis is broadly categorised into:

Physiological phimosis: Common in infants and young children due to natural adhesions between the foreskin and glans. This typically resolves spontaneously by age 6 (Kuriyama et al., 2014).

Pathological phimosis: Arises from chronic inflammation, recurrent infections, or dermatological conditions such as lichen sclerosus (balanitis xerotica obliterans), leading to fibrotic narrowing of the preputial ring (Levine & Goldstein, 2003; Southwell & Kawalek, 2015).

Phimosis presents in two clinically distinct forms, each with distinct etiologies and implications for treatment. The first, usually referred to as physiological phimosis, is a developmental state found in infants and young males, in which the foreskin is still attached to the glans. It is regarded as a normal early childhood anatomical appearance and tends to resolve spontaneously as the child matures, often by the age of six (Kuriyama et al., 2014).

The second kind, pathological phimosis, is secondary to acquired changes in the foreskin's anatomy. These include fibrotic thickening or scarring due to repeated inflammation, infection, such as balanitis, or chronic dermatoses such as lichen sclerosus (also called balanitis xerotica obliterans). In such cases, the foreskin becomes less elastic and more troublesome or even painful to retract (Levine & Goldstein, 2003; Southwell & Kawalek, 2015).

Population data indicate that physiological phimosis is common in early childhood and usually resolves spontaneously. Pathological phimosis, however, may persist into adolescence or adulthood and often necessitates medical or surgical intervention according to severity and associated symptoms.

International surveys indicate that the majority of boys outgrow physiological phimosis spontaneously during adolescence, whereas acquired types?often due to poor hygiene or dermatologic disease?are retained into adulthood in 1?3% of men (Franco & Robinson, 2012; Yang et al., 2020).

Pathophysiology

Physiological phimosis is due to normal epithelial bonds between the glans and inner foreskin, usually resolving spontaneously (Kuriyama et al., 2014). Pathological phimosis consists of chronic inflammation (due to infection or irritants), which leads to proliferation of fibroblasts and deposition of collagen, creating a nonelastic band of prepuce (Levine & Goldstein, 2003). Balanitis xerotica obliterans, an autoimmune inflammatory dermatosis, is the prototype of irreversible fibrotic change (Southwell & Kawalek, 2015).

Clinical Presentation

Patients may present with:

- Foreskin failure to retract completely

- Ballooning of the prepuce with micturition

- Painful erections, dyspareunia, or penetration difficulty

- Recurrent balanoposthitis, pruritus, or Offensive smell

- Psychological sequelae: embarrassment, anxiety, or sexual avoidance (Smith & Patel, 2018)

Physical examination usually shows a stenosed preputial orifice; forceful, repeated attempts at retraction differentiate between physiological and fibrotic phimosis. Paraphimosis must be ruled out urgently.

Diagnostic Workup

- Diagnosis is largely clinical. Additional investigations are:
- Dermatologic examination: To make a diagnosis of lichen sclerosus in suspected balanitis xerotica obliterans
- Urinalysis and culture: In recurrent balanoposthitis
- Ultrasound: To assess more deep scarring or involvement of the urethra if obstructive symptoms are persistent (Southwell & Kawalek, 2015)
- Uncomplicated physiological phimosis in children requires no imaging.

Management Strategies

- Conservative Therapy: Topical corticosteroids: Twice?daily application of 0.05?0.1% betamethasone cream over 4?8 weeks achieves noninvasive foreskin retraction in 65?90% of boys and men (Geng et al., 2014).
- Preputial stretching exercises: Gentle daily manual retraction increases tissue compliance, particularly when supplemented with steroid treatment (Levine & Goldstein, 2003).
- Hygiene measures: Soaks and lubricating cleansing reduce microbial load and inflammation and predispose to conservative treatment.

Minimally Invasive Procedures

- Preputioplasty: Y or Z plasty incisions enlarge preputial ring size without reducing foreskin length, with good cosmetic and functional outcomes (Mayan et al., 2016).
- Dorsal slit: A Single midline incision is effective in relieving tension rapidly under local anaesthesia in adult men with severe phimosis (Ni'o et al., 2018).

Surgical Intervention

- Circumcision: Total removal of the foreskin is still definitive; complication rates are low (<2%) under skilled hands, and long term satisfaction is excellent (Meissner & Braga, 2017).
- Laser-assisted ring incision: CO? lasers enable the precise division of the fibrotic ring with minimal bleeding and rapid healing (Wang et al., 2019).

Psychosocial Considerations

Phimosis degrades self?esteem and sexual relationships. Qualitative evidence indicates reluctance to discuss genital conditions, leading to a delay in treatment and more concern (Smith & Patel, 2018). A patient-centred approach combining education with clarity, empathic communication, and, as required, referral for counselling adds psychological strength as well as physical control.

Discussion

Conservative treatment must be first?line for most physiological and mild pathological cases because they have high cure rates and low morbidity (Geng et al., 2014). Preputioplasty preserves foreskin function and aesthetics, with the simplest being a dorsal slit, which gives immediate relief and low technical demands. Circumcision is still the optimal choice for recurrent balanitis or scarring that is irreversible. Patient preference and psychosocial environment should inform modality choice, with a focus on shared decision-making. The outstanding gaps in evidence are the long?term comparative effectiveness of minimally invasive approaches and the application of standardised outcomes measures for patient?reported satisfaction.

Future Directions: Being researched are advances, such as:

- Regenerative medicine: Platelet-rich plasma injections aim to restore the elasticity of the foreskin and reduce fibrotic remodelling (Chang et al., 2021).
- Topical antifibrotic agents: Novel drugs suppressing collagen cross?linking in balanitis xerotica obliterans are in preclinical development (Franco et al., 2020).
- Digital health platforms: Teleurology apps offer remote monitoring of adherence to conservative therapy and patient education (Lundahl & Bond, 2019).

Conclusion

Phimosis varies from benign developmental nonretractability to pathological fibrosis with significant urogenital and psychosocial effects. A multilevel patient-centred strategy?starting with topical steroids and stretching, followed by reconstructive surgery, and circumscribing circumcision for refractory situations?optimises outcomes. The addition of psychosocial interventions and studies into regenerative therapies will continue to demedicalize the management of phimosis.

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Competing interests

The authors declare that they have no competing interests.

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