

Pathologic and physiologic phimosis

Approach to the phimotic foreskin

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ABSTRACT

OBJECTIVE To review the differences between physiologic and pathologic phimosis, review proper foreskin care, and discuss when it is appropriate to seek consultation regarding a phimotic foreskin.

SOURCES OF INFORMATION This paper is based on selected findings from a MEDLINE search for literature on phimosis and circumcision referrals and on our experience at the Children's Hospital of Eastern Ontario Urology Clinic. MeSH headings used in our MEDLINE search included "phimosis," "referral and consultation," and "circumcision." Most of the available articles about phimosis and foreskin referrals were retrospective reviews and cohort studies (levels II and III evidence).

MAIN MESSAGE Phimosis is defined as the inability to retract the foreskin. Differentiating between physiologic and pathologic phimosis is important, as the former is managed conservatively and the latter requires surgical intervention. Great anxiety exists among patients and parents regarding non-retractile foreskins. Most phimosis referrals seen in pediatric urology clinics are normal physiologically phimotic foreskins. Referrals of patients with physiologic phimosis to urology clinics can create anxiety about the need for surgery among patients and parents, while unnecessarily expanding the waiting list for specialty assessment. Uncircumcised penises require no special care. With normal washing, using soap and water, and gentle retraction during urination and bathing, most foreskins will become retractile over time.

CONCLUSION Physiologic phimosis is often seen by family physicians. These patients and their parents require reassurance of normalcy and reinforcement of proper preputial hygiene. Consultation should be sought when evidence of pathologic phimosis is present, as this requires surgical management.

RÉSUMÉ

OBJECTIF Revoir les différences entre les phimosis normal et pathologique, rappeler les soins appropriés du prépuce et discuter des cas de prépuces phimotiques qui requièrent une consultation.

SOURCE DE L'INFORMATION Cet article est fondé sur les résultats d'une recherche dans MEDLINE concernant les demandes de consultation pour phimosis et circoncision, et sur l'expérience des auteurs à la Clinique d'urologie du Centre hospitalier pour enfants de l'est de l'Ontario. Les rubriques MeSH utilisées pour la recherche dans MEDLINE incluaient «*phimosis*», «*referral and consultation*» et «*circumcision*». La plupart des articles sur les demandes de consultation pour phimosis et prépuce étaient des revues rétrospectives et des études de cohorte (preuves de niveaux II et III).

PRINCIPAL MESSAGE Le phimosis se définit comme l'incapacité de rétracter le prépuce. Il importe de différencier le phimosis physiologique du phimosis pathologique, puisque le premier se traite aisément tandis que le second exige une intervention chirurgicale. Un prépuce non rétractile suscite beaucoup d'anxiété chez les patients comme chez les parents. La plupart des patients qui sont envoyés aux cliniques d'urologie pédiatrique pour phimosis ont des prépuces phimotiques physiologiquement normaux. Le fait d'envoyer des cas de phimosis physiologiques aux cliniques d'urologie peut inquiéter patients et parents sur l'éventualité d'une chirurgie, tout en allongeant indûment la liste d'attente des évaluations en spécialité. Les pénis non circoncis ne requièrent aucun traitement particulier. La plupart des prépuces finissent par devenir rétractiles si on les lave normalement avec de l'eau et du savon, et si on les rétracte délicatement pendant la miction ou le bain.

CONCLUSION Le médecin de famille est souvent consulté pour des phimosis physiologiques. Il doit alors rassurer patients et parents sur la normalité de cette condition et leur rappeler les mesures d'hygiène adéquates du prépuce. En présence d'un phimosis pathologique, il doit demander une consultation, puisque cette condition requiert un traitement chirurgical.

This article has been peer reviewed.

Cet article a fait l'objet d'une révision par des pairs.

Can Fam Physician 2007;53:445-448

Family physicians represent the front line in health care, and, hence, are most likely to make the initial discovery of a phimotic foreskin. Being able to distinguish between pathologic and physiologic phimosis would greatly reduce unnecessary, costly referrals. It would also help primary care physicians recognize and treat these cases more appropriately and help reassure patients and their families.

Case description

A 3-year-old boy is brought to your office by his parents with the complaint of a "tight" foreskin (Figure 1A). They anxiously explain that their son's foreskin has never retracted fully, despite several attempts over the past few months. Both parents believe that this is abnormal and ask whether you believe he needs a circumcision.

While taking the patient's history, you find out that the patient's foreskin balloons occasionally with voiding. He has had no urinary tract infections and is otherwise healthy.

Sources of information

This article is based on selected findings from a MEDLINE search for literature on phimosis and circumcision referrals and on our experience at the Urology Clinic at the Children's Hospital of Eastern Ontario. The literature on this topic consists mainly of level II (cohort studies) and level III (retrospective reviews) evidence. The cohort studies performed in Europe are the studies most often cited in the urologic community when discussing phimosis.^{1,2} These cohort studies pioneered the way we approach phimosis, as they helped elucidate the natural history of the foreskin.

Fate of the foreskin

The prepuce (foreskin) is the retractile covering of the glans penis. It serves many functions, including protective, erogenous, and immunologic.^{3,4} During neonatal development the prepuce is normally non-retractile, as the inner epithelial lining of the foreskin and the glans adhere to one another.^{1,3} Non-retractile foreskins are common among young boys and are a normal part of preputial development. More than half a century ago, it was shown that the prepuces of newborns are non-retractile, while at 3 years of age, up to 10% of foreskins remain non-retractile.² It should be noted that, in these small children, even retractable foreskins might not be fully retractable, as inner preputial adhesions

are still seen in most boys at age 6.² What of the 10% of 3-year-old boys with non-retractile foreskins? Oster¹ answered this question in an elegant cohort study published in 1968. Oster extended the study and found that 8% of boys at the age of 6 years, and 1% at the age of 16 years, still had non-retractile foreskins.¹ The foreskin gradually becomes retractable secondary to intermittent erections and keratinization of the inner epithelium.^{1,5} The moral of the story told by these 2 seminal studies is that, if one is patient and does not rush Mother Nature, most foreskins will become retractile by adulthood.

What is phimosis?

Phimosis is a condition in which the prepuce cannot be retracted over the glans penis. True pathologic phimosis exists when failure to retract is secondary to distal scarring of the prepuce. This scarring often appears as a contracted white fibrous ring around the preputial orifice. In contrast, physiologic phimosis consists of a pliant, unscarred preputial orifice. Physiologic phimosis is common in male patients up to 3 years of age, but often extends into older age groups.^{1,2,6,7} These 2 separate conditions are, by and large, clearly distinguishable on physical examination (Figure 1B).

Exacerbating factors

Several factors might prevent full retraction of a foreskin. Most of the time retraction is prevented by persistence of preputial adhesions. These adhesions are remnants of the fused layer between the glans and prepuce. Although these can initially prevent full retraction, adhesions usually spontaneously resolve with gentle retraction of the foreskin during bathing and during intermittent erections throughout childhood.

Boys who have recurrent episodes of balanitis or balanoposthitis are at risk of developing scarred preputial orifices, contributing to pathologic phimosis. Application of a corticosteroid cream to the non-scarred preputial outlet loosens the tissues in approximately 80% of cases, allowing for improved foreskin retraction. Balanitis xerotica obliterans is a form of penile lichen sclerosis et atrophicus. Scarring secondary to balanitis xerotica obliterans is a common cause of pathologic phimosis. Balanitis xerotica obliterans is usually resistant to topical corticosteroid therapy.

Common problems affecting the foreskin

A variety of conditions can affect the foreskin of a child. Many are benign, but might require medical attention.

Smegma. Smegma consists of desquamated epithelial cells that have been trapped under the prepuce. Especially in children who do not yet have a fully retractable foreskin, these sloughed epithelial cells form white lumps under the foreskin, commonly located around the

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Figure 1. Tight preputial orifice on retraction of foreskin: A) Skin at preputial outlet is healthy with no scarring, and the inner preputial mucosa is starting to evert through the outlet. With physiologic phimosis, the preputial outlet is always closed and one cannot see the glans unless the foreskin is retracted, as the examiner has done in the photograph. B) In many cases of pathologic phimosis, the glans and meatus are visible without any attempt at retraction, as the scarred ring holds the preputial outlet open. There is no inner mucosal eversion through the outlet.



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corona. Smegma is completely benign and will eventually extrude once the foreskin becomes more retractile.

Paraphimosis. Paraphimosis is a condition in which the foreskin is left retracted for an extended period. Swelling occurs, causing the foreskin to become trapped behind the glans. This is common among children who have forgotten to reduce their foreskin after voiding or bathing. Paraphimosis constitutes an emergency, as patients often experience substantial pain and penile swelling; thus it requires prompt reduction. Most cases of paraphimosis can be reduced with constant pressure applied to the glans to “squeeze” out the edema, followed by a physician’s forcefully pushing on the glans with the thumbs while pulling the foreskin with the fingers. Severe cases might require a dorsal slit procedure, which is usually performed under sedation. Although paraphimosis could compromise blood supply to the glans, it is quite rare. Paraphimosis does not necessarily mean circumcision will eventually be required.

Adhesions. Adhesions are remnants of the fused layer between the glans and prepuce. They are common among children, but eventually break down following foreskin retraction and intermittent erections. By the teenage years they should have completely disappeared.

Ballooning. Among children, ballooning of the foreskin can occur secondary to a tight foreskin. Although this

can produce anxiety among parents, it is a completely benign process. Ballooning resolves with time as the foreskin becomes more retractile.

Balanitis. Balanitis can occur secondary to poor hygiene and is common among boys still wearing diapers. The foreskin might serve a protective role among diapered boys, preventing the occurrence of inflammatory meatal stenosis. Treatment usually consists of local cleansing and application of antibacterial ointment. On occasion, a course of oral antibiotics might be needed. Repetitive episodes of balanoposthitis can lead to scarring and, eventually, pathologic phimosis.

Proper preputial hygiene

Proper care for an uncircumcised penis is simple and helps prevent pathologic foreskin conditions. The foreskin should be left alone until the prepuce demonstrates an ability to retract. If the foreskin does not yet retract, there is nothing to “clean under.” Once the prepuce can be retracted, foreskin hygiene may commence, with children learning to gently retract their own foreskins during voiding or bathing. Children normally stop retracting their foreskins if they have any discomfort. It is important to prevent forceful retraction. Forcefully retracting the foreskin creates microtears at the preputial orifice, leading to scarring that might eventually cause formation of a phimotic ring. Hence, the foreskin should be retracted gently to its maximum extent and no farther.

The foreskin can be cleansed during routine bathing. The foreskin should be pulled back gently and rinsed with soap and water. Once dried with a towel, the foreskin must always be brought back down to its original position to cover the glans.

Treatments for phimosis


Most patients who present with tight foreskins have physiologic phimosis.⁸ The best treatment for these patients is “tincture of time.” These patients require no more than reassurance of normalcy and reinforcement of proper preputial hygiene. A 6- to 8-week course of topical corticosteroids (eg, 0.1% triamcinolone topical cream), applied directly to the preputial outlet twice daily, can be tried to help speed up the process,^{9,10} but this is not needed in all cases. As discussed above, most foreskins will become retractable with time; only 1% of phimotic foreskins remain non-retractile once children enter their teenage years.¹ Teenagers might experience painful erections secondary to phimotic foreskins. Although this is a rare presentation, it can cause considerable grief for patients; hence urologic consultation should be sought for residual phimosis among teenagers.

The one absolute indication for performing a circumcision remains pathologic phimosis. If the preputial orifice is scarred, consult a pediatric urologist for advice. While waiting for the referral appointment, a course of topical corticosteroids can be prescribed for children. Although this course is usually fruitless, some studies show that topical corticosteroids might help with mild scarring.^{8,9} Indications for urologic referral are listed in **Table 1**.

Table 1. Indications for urologic consultation regarding the foreskin

Pathological phimosis (circumferential scarring of preputial orifice)
Painful erections secondary to a tight foreskin
Recurrent bouts of balanitis
Recurrent urinary tract infections with a phimotic foreskin

Case conclusion

Examining the foreskin of this 3-year-old boy, you notice that the preputial orifice appears healthy with no scarring. The inner preputial mucosa appears healthy. Consequently, you conclude that this is physiologic phimosis that will eventually resolve on its own over the next few years. You reassure the parents that this is normal and explain to them that their son has a healthy foreskin with no immediate health risks. At follow-up visits, if preputial scarring develops or the patient enters into the teenage years with a refractory phimosis, then urologic consultation should be sought. 

EDITOR'S KEY POINTS

- Proper foreskin hygiene, including gentle retraction and cleansing during bathing, helps prevent pathologic foreskin conditions.
- Only 1% of 16-year-old boys will have non-retractile foreskins, compared with 10% at 3 years of age.
- Most patients who present with tight foreskins have physiologic phimosis, which will generally resolve with time and proper foreskin hygiene. A short course (6 to 8 weeks) of topical corticosteroids might help.
- In pathologic phimosis, non-retraction is due to distal scarring of the prepuce. Referral to a urologist is indicated. A short course of topical corticosteroids might help with mild scarring.

POINTS DE REPÈRE DU RÉDACTEUR

- Une bonne hygiène du prépuce, incluant une rétraction et un nettoyage délicats durant le bain, aide à prévenir les pathologies du prépuce.
- Seulement 1% des garçons de 16 ans auront un prépuce non rétractile, par rapport à 10% à l'âge de 3 ans.
- La plupart de ceux qui ont un prépuce serré ont un phimosis physiologique qui se corrige généralement avec le temps et une hygiène adéquate. Un court traitement (6 à 8 semaines) avec des corticoïdes topiques peut être utile.
- Dans le cas du phimosis pathologique, la non-rétraction est due à une cicatrisation distale du prépuce. Une consultation en urologie est alors indiquée. En cas de cicatrisation légère, un court traitement de corticoïdes topiques peut être utile.

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