

# Phimosis – a diagnostic dilemma?

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**Introduction:** *Phimosis is defined as the inability to retract the foreskin. Differentiating between physiological phimosis and pathological phimosis is important, as the former is managed conservatively and the latter requires surgical intervention. Referrals of patients with physiological phimosis to urology clinics may create anxiety regarding the need for surgery amongst patients and parents, while unnecessarily expanding the waiting list for specialty assessment.*

**Objectives:** *To determine the ability of referring physicians to differentiate physiological from pathological phimosis, and to see whether there is any difference in this ability between generalists versus specialists.*

**Materials and methods:** *A retrospective chart review of 284 consecutive referrals for "phimosis" to the Children's Hospital of Eastern Ontario (CHEO) Urology Clinic during November 2000 - April 2003 was conducted. Referral sources included family physicians (FP), pediatricians (PD), emergency physicians (ER), and other subspecialists (SS). Data for this study were obtained from the original referral letters and cross-referenced with the impressions of the pediatric urologist following the initial patient encounter. The accuracy in diagnosing phimosis was evaluated among the various*

*types of referring physicians.*

**Results:** *A total of 284 phimosis referrals were reviewed of patients ranging from 2 months to 16 years of age (mean = 6.6 years). The referral sources consisted of 222-GP, 33-PD, 23-ER, and 6-SS. The majority of referred cases were diagnosed by the attending pediatric urologist as physiological phimosis across all referral sources, with the exception of subspecialists (FP = 75.2%, PD = 81.8%, ER = 56.5%, SS = 33.3%). Second to this was the diagnosis of pathological phimosis across all referral sources except SS (FP = 14.9%, PD = 12%, ER = 34.8%, SS = 50%). Overall, the circumcision rate for the 284 phimosis referrals reviewed was 14.4%.*

**Conclusions:** *Our findings reveal that many physicians continue to face difficulties in distinguishing physiological phimosis from the pathological. As a result, many unnecessary referrals are made for "phimosis". We suggest the implementation of improved educational measures regarding preputial pathophysiology in the medical curriculum. Such measures would serve two purposes: first, to reduce the number of unnecessary specialty referrals and secondly, to aid primary care physicians in recognizing the presence of physiological phimosis so that patients and families may be reassured of normalcy.*

**Key Words:** phimosis, physiological, pathological, primary care, diagnosis

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## Introduction

The prepuce (foreskin) is the retractable covering of the glans penis. It serves many functions, including

protective, erogenous, and immunological.<sup>1,2</sup> During neonatal development the prepuce is normally non-retractable as the inner epithelial lining of the foreskin and the glans are co-adherent.<sup>1,3</sup> The foreskin gradually becomes retractable secondary to keratinization of the inner epithelium and intermittent erections.<sup>3,4</sup> By the age of 3 years, approximately 90% of uncircumcised males have retractable foreskins.<sup>5</sup> In the remaining 10%, non-retraction is usually due to persistence of developmental adhesions between

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the glans and prepuce. This usually resolves by 17 years of age with only 1% remaining non-retractable.<sup>3</sup>

Phimosis is a condition in which the prepuce cannot be retracted over the glans penis. True pathological phimosis exists when non-retraction is secondary to a distal scarring of the prepuce. This scarring often appears as a contracted white fibrous ring around the preputial orifice. On the contrary, physiological phimosis lacks this scarring process and is a normal developmental phase of the prepuce. Physiological phimosis is a common finding in males up to 3 years of age, but can extend into older age groups.<sup>3,5-7</sup> Despite the distinction between these two entities, many physicians continue to have difficulty distinguishing one form over the other.<sup>8-12</sup> This often results in unnecessary phimosis referrals to pediatric urology clinics,<sup>8,9</sup> as well as unnecessary surgical procedures for which potential risks become a concern.<sup>9,13</sup> Figure 1 illustrates the difference between the two entities.

This distinction is important to recognize

considering the divergent management for these two conditions. Physiological phimosis is more appropriately managed by conservative measures, such as "tincture of time", or in select cases topical steroid therapy.<sup>4,14-21</sup> The standard treatment for pathological phimosis, on the other hand is circumcision,<sup>8,9,13</sup> although several studies have now shown topical steroids may be effective in the early phases of preputial outlet scarring.<sup>4,14-21</sup>

Given the importance in distinguishing between pathological and physiological phimosis, we have conducted a 3-year retrospective analysis of referrals to Children's Hospital of Eastern Ontario Urology Clinic made by a variety of practitioners to assess the accuracy of diagnosis between the two forms. Our analyses were further compared with those of earlier reports spanning over half-a-century to determine whether there have been considerable improvements in the ability to diagnose between these phimotic conditions.



**Figure 1.** The left side demonstrates a normal foreskin. The right side shows the typical circumferential cicatrization of the preputial orifice present in pathological phimosis.

## Materials and methods

Upon approval of the hospital's ethics review board, a retrospective chart review of 284 consecutive referrals for phimosis to Urology clinic during November 2000 – April 2003 was conducted. Referral sources included family physicians, pediatricians, emergency physicians, and other subspecialists (which included one orthopedic surgeon, two dermatologists, and three adult urologists). Only referrals that specifically stated "phimosis" as the reason for referral were included in this study. Other referral diagnoses, such as paraphimosis and preputial adhesions were not included. Data for this study were obtained from the original referral letters and by the clinical impressions of the pediatric urologist following the initial patient encounter. Findings from follow-up visits were not included. The diagnosis made by the pediatric urologist upon the initial encounter was then used to determine the diagnostic accuracy of the referring physician. During the time of the review, there were two pediatric urologists at CHEO (JGP, MPL) who concurred on the management of "phimosis" referrals. The diagnostic accuracies were then considered and compared amongst the various categories of referring physicians. Descriptive statistics were used to summarize the actual diagnoses among the various specialty groups of referring physicians. Differences in physicians' diagnoses were compared using the chi-square test. All reported p-values are two-sided, and a p-value < 0.05 was considered statistically significant.

## Results

Two hundred and eighty four consecutive phimosis referrals were reviewed. Patient age ranged from 2 months to 16 years, with a mean age of 6.63 years. All together, of the 284 phimosis referrals reviewed, only 48 (16.9%) were confirmed as pathological phimosis.

TABLE 1. Breakdown of phimosis referrals

Actual diagnosis	Number (%)
Pathological phimosis	48 (16.9)
Physiological phimosis	209 (73.6)
Preputial adhesions	18 (6.3)
Congenital megaprepuce	6 (2.1)
Other	3 (1.1)

However, 209 (73.6%) of the referrals were determined to be physiological phimosis Table 1. These results are further stratified among the various groups of referring physicians as shown in Table 2. In terms of treatment, the overall circumcision rate for the 284 phimosis referrals reviewed was 14.4%. The remaining patients (85.6%) were treated with conservative measures, which included observation or topical steroid cream in select cases.

Overall, there was no significant difference found between family physicians and pediatricians in their ability to diagnose pathological phimosis ( $p=0.611$ ). However, both emergency physicians and other subspecialists were significantly better at recognizing pathological phimosis when compared to family physicians ( $p=0.015$  and  $p=0.012$  respectively).

## Discussion

Non-retractable foreskins are common in young boys as a normal part of preputial development. Over half a century ago it was shown that the prepuce of the newborn is non-retractable, while at 3 years of age up to 10% of foreskins remain non-retractable.<sup>5</sup> It should be noted that the retractable foreskin in these small children might not be fully retractable, as inner preputial adhesions are still seen in the majority of boys at age six years.<sup>5</sup> What of the 10% of 3 year olds with non-retractable foreskins? Oster answered this

TABLE 2. Analysis of phimosis referrals by primary physician type

Referral source	Number of phimosis referrals	Actual diagnoses				
		Pathological phimosis	Physiological phimosis	Preputial adhesions	Congenital megaprepuce	Other
Family physician	222	33 (14.9%)	167 (75.2%)	17 (7.7%)	2 (0.9%)	3 (1.4%)
Emergency physician	23	8 (34.8%)	13 (56.5%)	0	2 (8.7%)	0
Pediatrician	33	4 (12.1%)	27 (81.8%)	0	2 (6.1%)	0
Other subspecialty	6	3 (50%)	2 (33.3%)	1 (16.7%)	0	0

question in an elegant cohort study published in 1968. He documented that amongst Danish schoolboys, only 1% had non-retractable foreskins at age 17 years.<sup>3</sup> The moral of the story told to us by these two seminal studies is that if one is patient and does not rush Mother Nature, the vast majority of foreskins will become retractable by adulthood. To date, pathological phimosis remains the predominant indication for performing a circumcision in our practice. However, it is our bias that misdiagnosed phimotic conditions occurs too frequently, resulting either in costly and unnecessary medical consultations with specialists, or worse, unnecessary circumcisions.

Physiological phimosis, consisting of a pliant non-scared preputial orifice, is clearly distinguishable from the rather uncommon pathological form consisting of a white cicatrization of the orifice. Still, the inability to distinguish true pathological phimosis from the physiological form remains problematic. According to our data, of the 284 "phimosis" referrals made to the CHEO Urology Clinic, only 16.9% were of the pathological form. The vast majority (73.6%) were confirmed to be physiological phimosis. These proportions closely match those previously reported in two separate, independent studies, where 13% and 25% of the referred cases of phimosis for circumcision were of the pathological form.<sup>8,9</sup> Overall, such observations reveal that ambiguity in diagnosis is widespread and still exists in distinguishing pathological phimosis from a normal developmentally non-retractable prepuce.

Pathological phimosis is the one absolute indication for performing a circumcision. In our study, the circumcision rate was found to be 14.4% which correlates closely with the number of referrals diagnosed as pathological phimosis (16.9%). In fact, other studies quote similar circumcision rates; that of Rickwood's study was 28%, while that of Griffith's study was 25%, both of which correlated closely with their diagnosis rate of pathological phimosis, 13% and 25% respectively.<sup>8,9</sup>

As reported here, the greatest proportion of phimosis referrals were made by family physicians, comprising 78.2% of the total. Given that this group represents the front line providers of medical care, this figure appears nontrivial, as they are more likely to make the initial discovery of a phimotic foreskin. Nevertheless, past studies state that most reprimand has gone towards family physicians for over-diagnosing phimosis, in general.<sup>9</sup> Thus, it is essential that family physicians be able to distinguish normal versus pathological phimosis. Of the 222 phimosis referrals made by family physicians, 14.9% were later

determined to be of the pathological variant, and 75.2% of the physiological variant, a clear indication of diagnostic uncertainty.

Significant proportions of phimosis referrals were made by specialists, comprising 21.8% of the total. These included pediatricians (11.6%), emergency physicians (8.1%), and other subspecialists (2.1%). Of these three groups, referrals made by emergency physicians were more often diagnosed as pathological phimosis. This may be attributed to a form of selection bias, as emergency physicians are more likely to see urgent (pathological) conditions rather than asymptomatic (physiological) conditions. However, of the 62 phimosis referrals made by specialists, 24.2% were determined to be pathological. Once again, the greatest proportion of these referrals was diagnosed as physiological phimosis (67.7%). These findings demonstrate that when one considers all referrals made by the various groups of physicians studied herein, more than half of these patients were referred for an otherwise normal finding. These results are rather startling and troublesome, as the assumption would be that such a common, normal developmental process would be more easily recognized.

It is clear from the data presented here that improved educative measures are essential in order to accurately differentiate pathological phimosis from physiological phimosis across all specialties. By virtue of the fact that family physicians represent the greatest number of overall referrals, our results, as well as those previously reported, would suggest directing educational efforts primarily towards these front line practitioners. Proportionately, however, the majority of referrals made to our clinic were later diagnosed as physiological, with the exception of those referrals by other subspecialists. Thus, once the distinction between pathological and physiological phimosis becomes clearer, then it is obvious that the majority of referrals reviewed in this study were unnecessary. Being able to make this distinction would greatly assist in reducing unnecessary, costly referrals. Second to this, it would aid primary care physicians in recognizing and treating these cases more appropriately, along with reassuring the patients and their families.

Compounding this problem is the fact that most textbooks and medical curricula regarding phimosis are outdated. However, sources do exist that provide distinct guidelines for diagnosing and referring for such conditions.<sup>22</sup> Information regarding the normal development of the prepuce and how to distinguish pathological from physiological phimosis will help to reduce the over diagnosis of pathological phimosis,

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or likewise, the under-recognition of physiological phimosis.

### Conclusion

Since family physicians and pediatricians constitute the largest referral source for “phimosis”, efforts directed at educating them to distinguish between pathological and physiological phimosis should be undertaken. This would hopefully allow the individuals with pathological phimosis to receive more prompt urological care, while reassuring the families of children with physiological phimosis that they need not see a surgeon. Such efforts at education should ideally occur in the medical school curriculum and in post-graduate CME courses for those individuals already in practice. □

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