Management of Non Retractile Foreskin.
A 10-Year Experience

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ΠΕΡΙΛΗΨΗ
Σκοπός της μελέτης αυτής είναι να παρουσιάσει τον τρόπο αντιμετώπισης της κλειστής ακροποσθίας, με την μικρότερη δυνατή παρέμβαση, όταν αυτή κρίνεται απαραίτητη. Εκπονήθηκε βάσει πρωτοκόλλου το οποίο καθορίζει τα αίτια της κλειστής ακροποσθίας, τις ενδείξεις διάνοιξης αυτής, την επιλογή των θεραπευτικών μεθόδων (συντηρητικών ή χειρουργικών) και καταγράφει τα αποτελέσματα της αντιμετώπισης για χρονικό διάστημα 10 ετών.

Υλικό-μέθοδος. Κατά το διάστημα 1998-2008, 812 παιδιά, ηλικίας 1-15 χρονών, προσήλθαν σε τακτικό ιατρείο με την αιτιολογία της φίμωσης. Τα 608 παιδιά (74,9%) είχαν μία τουλάχιστον ένδειξη διάνοιξης της ακροποσθίας, ενώ στα 204 παιδιά (25,1%) δεν έγινε καμία παρέμβαση και συστήθηκε επανέλεγχος. Τα 608 παιδιά χωρίστηκαν σε τρεις ομάδες ανάλογα με την αιτιολογία της κλειστής ακροποσθίας. Βαλανοποθητικές συμφύσεις είχαν 99 παιδιά (ομάδα Α), μερική ή φυσιολογική φίμωση είχαν 489 παιδιά (ομάδα Β) και ολική ή παθολογική φίμωση είχαν 20 παιδιά (ομάδα Γ). Στις ομάδες Β και Γ χορηγήθηκε θεραπεία με τοπική εφαρμογή κρέμας βηταμεθαζόνης, και στη συνέχεια έγινε διάνοιξη της ακροποσθίας, όπου ήταν εφικτό, ενώ στην ομάδα Α έγινε συμφυσιόλυση άμεσα.

Αποτελέσματα. Από τα 204 παιδιά στα οποία δεν έγινε καμία παρέμβαση τα 122 (60%) επανελέγχηκαν 3-7 χρόνια μετά και η ακροποσθία άνοιξε αυτόματα στο 75%. Στη θεραπεία με βηταμεθαζόνη ανταποκρίθηκαν 404 παιδιά (82,8%) της ομάδας Β, ενώ στην ομάδα Γ η διάνοιξη της ακροποσθίας έγινε με συνδυασμό χορήγησης βηταμεθαζόνης και πλαστικής σε ποσοστό 11% (2 παιδιά). Από τα 608 παιδιά, 90 παιδιά (14,8%) υπεβλήθησαν σε πλαστική της ακροποσθίας, ενώ 17 παιδιά (2,9%) σε περιτομή.
Συμπεράσματα. Η διάνοιξη της ακροποσθίας πριν την εφηβεία πρέπει να διενεργείται εφόσον υπάρχουν συγκεκριμένες ενδείξεις. Στα παιδιά με μερική φίμωση η χορήγηση βηταμεθαζόνης έχει ως αποτέλεσμα τη διάνοιξη της ακροποσθίας σε υψηλό ποσοστό ενώ μικρό ποσοστό οδηγείται σε πλαστική αποκατάσταση της ακροποσθίας. Στην ολική φίμωση το μεγαλύτερο ποσοστό δεν θα αποφύγει την περιτομή.

Λέξεις ευρετηριασμού:
κλειστή ακροποσθία, βαλανοποσθικές συμφύσεις, φυσιολογική φίμωση, παθολογική φίμωση

SUMMARY

AIM: The aim of this study is to present the management of non retractile foreskin, with the minimum intervention, when this is judged essential. It was worked out under a protocol which determined the aetiology of closed prepuce, the indications for its opening, the choice of therapeutic methods (conservative or surgical) and recorded the treatment results for 10 years.

MATERIALS & METHODS: During 1998-2008, 812 children, aged 1-15 years, were presented with phimosis. 608 children (74.9%) had at least one medical indication for preputial opening, while in 204 children (25.1%) there was no intervention established and re-examination was recommended. The 608 children were divided into three groups depending on the cause of non retractile foreskin. 99 children (Group A) exhibited preputial adhesions, 489 children (Group B) had partial or physiological phimosis and 20 children (Group C) had complete or pathological phimosis. Groups B and C were treated with betamethasone cream, and then, where possible, preputial opening was performed, while group A was managed with direct adhesiolysis.

RESULTS: Of the 204 children in which no intervention was realized, 122 (60%) were followed up 3-7 years later and the foreskin automatically opened at 75%. 404 children (82.8%) in Group B responded to treatment with betamethasone cream while, in Group C the preputial opening resulted from a combination of betamethasone and preputioplasty for 11% (two children) of the study group. Out of all 608 children, 90 children (14.8%) underwent preputioplasty and 17 children (2.9%) circumcision.

CONCLUSIONS: The opening of the prepuce before puberty should be performed if specific medical indications are present. In children with partial phimosis, topical betamethasone cream results to the opening up of prepuce in high percentage whereas a low percentage is scheduled for preputioplasty. In complete phimosis, the majority will not escape circumcision.

Key words:
non retractile foreskin, preputioplasty, circumcision, preputial adhensions, physiological or partial phimosis, pathological or complete phimosis
INTRODUCTION

The term “phimosis” (from the Greek word “φίμωση”- pronounced “fimosi” which means “closure”) is used to describe the difficulty in retracting the prepuce (non retractile foreskin). The three different clinical conditions causing non retractile foreskin are: a) preputial adhesions (Figure 1), b) partial or physiological phimosis or narrow preputial ring (Figure 2) and c) complete or pathological phimosis or balanitis xerotica obliterans-BXO and cicatricial stenosis (Figure 3).

The inadequate understanding of the structure, function and development of the prepuce in the past and the non-classification of phimosis into partial and complete, has led a great number of the population to the surgical removal of the prepuce (circumcision).

Apart from the religious canons and cultural traditions mandating circumcision, in many countries, it has been observed that a great number of newborns, infants and children were subjected to circumcision without manifesting clear medical indications.

The establishment of the important role of the prepuce in the penile function and sexual intercourse and the failure of false impressions as per the greater morbidity rate of the genitourinary system in uncircumcised males resulted in the review of non retractile foreskin management. Conservative treatments by topical corticosteroids application (SAIDs) and...
alternative surgical techniques (preputioplasty) aiming to the preservation of the prepuce, were proposed.

In the present study, we point out the results of the least invasive opening non retractile foreskin, when deemed necessary, based on a protocol for a period of 10 years.

MATERIALS & METHODS

The protocol followed, determined the non retractile foreskin aetiology, the medical indications for opening, when judged essential, the treatment method and the recording of the results.

During 1998-2008, 812 children aged 1-15 years presented to the office. The children in question were referred to by pediatricians throughout Greece for non retractile foreskin, commonly reported by them as “phimosis”.

Out of the 812 children, 204 (25.1%) exhibited preputial adhesions, showing no medical indication for foreskin opening and thusly no procedure was performed. The parents were informed that the foreskin would open spontaneously and that they should only re-visit in case one of the medical indications for opening arose. Follow-up was recommended before puberty by explaining the reasons to the parents (painful erections, masturbation, sexual intercourse).
608 children (74.9%) presenting at least one medical indication for preputial opening, were divided into 3 groups depending on the non retractile foreskin aetiology, as follows:

Group A: 99 children (16.2%) with preputial adhesions

Group B: 489 children (80.5%) with partial phimosis – narrow prepuce and

Group C: 20 children (3.2%) with true phimosis. Of them, 8 children were diagnosed with BXO and 12 with post-traumatic phimosis, based on their history and clinical evaluation.

75% of Group A children referred to with preputial adhesions, had episodes of balanoposthitis. Of Group B children with narrow foreskin, 12 (2.45%) were asymptomatic, whereas 477 (78.4%) manifested episodes of balanoposthitis, 25 (4.2%) children showed prepuce dilation during micturition (ballooning), 13 (2.1%) suffered from an episode of paraphimosis, 20 children (3.3%) had previous urinary tract infection (UTI) and 421 (69.3%) exhibited concentration of apoptosed epithelial cells between the prepuce and the foreskin and complained of localized discomfort.

All 20 BXO children of Group C (100%) had recurring episodes of balanoposhtitis - 12 of them were traumatized in their effort to violently manipulate the foreskin (Table 1).

<table>
<thead>
<tr>
<th>TABLE 1 (DATA OF CHART2)</th>
<th>Symptoms (608 children)</th>
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<tbody>
<tr>
<td></td>
<td>A</td>
</tr>
<tr>
<td>Balanoposthitis</td>
<td>95(15.6%)</td>
</tr>
<tr>
<td>Ballooning</td>
<td>-</td>
</tr>
<tr>
<td>Paraphimosis</td>
<td>-</td>
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<tr>
<td>UTI</td>
<td>-</td>
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<tr>
<td>Concentration</td>
<td>-</td>
</tr>
<tr>
<td>of apoptosed epithelial</td>
<td>87(14.2%)</td>
</tr>
<tr>
<td>cells – local discomfort</td>
<td>99(16.2%)</td>
</tr>
</tbody>
</table>

RESULTS

Management was based on the non retractile foreskin protocol followed in our clinic. (Table 2)

In 204 children (25.1%) with asymptomatic preputial adhesions and narrow preputial ring, no treatment was applied. A follow-up in 10 years time was advised except for the cases where balanoposthitis, paraphimosis, UTIs or concentration of epithelial cells would develop in the meantime - in such cases, the earlier re-examination was recommended. It was stressed that no effort should be put in retracting the foreskin which, to a great extent, would open spontaneously until the age of 10; if at the age of 10 the foreskin had not opened, then, an opening procedure would be performed.

The rest 608 children (74.9%), presenting one of the foreskin opening medical indications, were treated with betamethasone cream 0.05% for 4 or 5 weeks and they were advised to re-visit the office on the 5th or 6th week for foreskin opening procedure.

Children with symptomatic preputial adhesions (Group A) underwent foreskin opening and direct preputial adhesiolysis by topical anaesthetic application (EMLA) and
orally administered analgesics (paracetamol). Children with narrow foreskin (Group B) underwent foreskin opening and preputial adhesiolysis on the 5th or 6th week subsequently to the betamethasone treatment. We also treated all children with BXO or cicatricial stenosis (Group C) with betamethasone, having previously informed their parents of the few chances of treatment success. Children in Group B, whose foreskin remained non retractile even after the conservative treatment, underwent preputioplasty whereas, those in Group C whose treatment did not prove favorable, underwent circumcision.

All children who underwent foreskin opening were followed-up 1 month and 1 year later.

60% of the children, who were not subjected to any kind of procedure, were followed-up 3-7 years later and their foreskin opened spontaneously by 75%. To the betamethasone treatment, 404 children (82.8%) of Group B responded well, whereas in 11% (2 children) of Group C, foreskin opening was accomplished via a combination of betamethasone administration and preputioplasty. Out of 608 children presenting medical indication for foreskin opening, 90 children (14.8%) underwent preputioplasty and 17 underwent (2.9%) circumcision.

24 children of Group A (25%) with preputial adhesions exhibited recurring adhesions and adhesiolysis was performed anew. 85 children from Group B (17.2%) with preputial stenosis, re-visited the office with preputial restenosis in less than a year’s time and a second session took place with topical treatment with betamethasone. 70 of said children (14.4%), eventually underwent preputioplasty. In 6 (8.5%) children with narrow foreskin who had been subjected to preputioplasty, foreskin stenosis recurred and we finally proceeded with hemi-
circumcision (removal of the inner preputial lamina). Out of the 20 children with BXO and cicatricial stenosis (Group C), 19 (95%) were eventually operated; 2 children (11%) had a preputioplasty and 17 (85%) were circumcised.

**DISCUSSION**

Non retractile foreskin in childhood may be caused by three different clinical conditions. 3,6,7,10,15

a) **Preputial adhesions** which are physiologic epithelial tissue intervening between the foreskin and the prepuce. Usually, they lyse spontaneously and the prepuce separates from the inner preputial lamina within the first 6 months up to 3 years. However, it is not uncommon that they persist until puberty.

b) **Partial or pathologic phimosis** or narrow preputial ring, a tissue ring around the preputial orifice which usually expands until the age of 5-7 years or rarely until puberty, and

c) **Complete or pathologic phimosis** - in children, it is usually induced by cicatricial stenosis or BXO. Cicatricial stenosis develops after an injury resulting from forcible retraction. BXO usually develops after the age of five and bears definite clinical aspects differentiating it from narrow foreskin, although this differentiation is not always clear, since no objective criteria have been set. 4,6,13,16,17

Taking into consideration the foreskin development until puberty and its important role in sexual intercourse, it should be understood that non retractile foreskin does not need opening prior to sexual intercourse onset except in cases presenting specific medical indications.

Patients with persistent non retractile foreskin of all causes, should undergo foreskin opening at puberty onset (after the age of 10) to facilitate prepuce retraction. The reason is the difficulty (pain) they will encounter during masturbation and sexual intercourse as well as the risk of developing secondary phimosis induced by friction.

The medical indications for opening non retractile foreskin prior to sexual intercourse onset and its management are proportionate to the cause. Namely,

a) **Preputial adhesions** (Figure 1). Medical indications for opening the non retractile foreskin due to the existence of preputial adhesions is balanoposthitis and local discomfort (itching and stinging) which increase friction and the possibility to develop balanoposthitis.

Nevertheless, asymptomatic patients do not require any treatment, let alone prior to sexual intercourse onset on condition that the non retractile foreskin persists. When adhesiolysis is considered necessary, it should be performed by a surgical instrument following the application of a topical anaesthetic. The attempt to forcibly retract the foreskin by the hands results in traumas at the prepuce orifice which may cause scars (fibrosis) and complete phimosis.

b) **Complete or partial phimosis** (BXO, post-traumatic cicatricial stenosis (Figure 2). BXO usually develops after the age of 5 and is histologically manifested as skin oedema,
lymphatic infiltration and degeneration of the Malpighian layer (stratum malpighi)\textsuperscript{4,18}. Most authors consider circumcision (surgical removal of the foreskin) as the most advisable treatment yet, others support that the combination of topical steroidal anti-inflammatory drugs (SAIDs) application and preputioplasty at an early stage is effective in about 20\% of the patients \textsuperscript{11,15-17,20}. The question is, of course, if it is worth trying to preserve prepuce via this approach by subjecting a child to a second procedure (circumcision) given the small rate of restoration in BXO cases. Post-traumatic cicatricial stenosis is induced by a trauma caused during violent manipulation of the foreskin to retract.

c) Partial or pathologic phimosis (narrow preputial ring). Medical indications for the opening of the narrow foreskin and the retraction of the prepuce prior to sexual activity onset are recurrent balanoposthitis, scars at the prepuce orifices which mainly result from the attempt to open the foreskin and localized discomfort. The foreskin dilation during micturition (ballooning), unaccompanied UTI and paraphimosis have been the subject of controversy regarding their management.\textsuperscript{21}

Until the beginning of the 1970s, the narrow foreskin was restored by circumcision. Later, alternative treatments were proposed aiming to the preservation of the foreskin in cases where its amputation was not deemed necessary.

Management with topical SAIDs has many supporters claiming that the restoration rate reaches 70-90\%. The treatment plan includes topical SAIDs (betamethasone 0.05\%) for 4-5 weeks twice on a daily basis with subsequent attempt to open the foreskin\textsuperscript{10,11,15,22-24}. Some authors suggest the application of topical nonsteroidal anti-inflammatory drugs-NSAIDs (Diclofenac)\textsuperscript{25}.

Management of partial phimosis with preputioplasty is effective in the expansion of the narrow ring without removing the foreskin. Several preputioplasty techniques have been applied\textsuperscript{10,22,26,27}. Lateral preputioplasty is preferred, in our opinion, given that compared to the rest of the approaches, bears the smallest rate of re-stenosis and has a better aesthetic result. When non retractile foreskin opening is judged essential, a topical SAIDs treatment should be applied at first and in case the results are not the anticipated ones, to proceed with preputioplasty.

CONCLUSIONS

Non retractile foreskin is due to preputial adhesions, partial or physiologic phimosis and complete or pathologic phimosis. The accuracy of diagnosis is crucial – all these different clinical conditions require different management.

Partial phimosis and preputial adhesions are normal conditions and until puberty onset, we expect the spontaneous foreskin opening; complete phimosis is primarily manifested after the age of five.

Opening prior to puberty onset should only be performed based on specific medical indications. Nonetheless, if the foreskin is still non retractile at the beginning of puberty, the opening is mandatory in order to avoid any problems during sexual intercourse.
When deemed necessary, the non retractile foreskin opening procedure must be the most conservative one aiming to the preservation of the prepuce. Circumcision should only be performed when all other approaches have proved ineffective, thusly considering circumcision of total necessity.

The treatment option for preputial adhesions is adhesiolysis. The opening of narrow foreskin is initially attempted with topical SAIDs and, in case of failure, it is managed with preputioplasty. BXO is the sole cause of non retractile foreskin where circumcision seems to advance over other treatment methods, although the combination of SAIDs and preputioplasty should be studied in further. Concluding, it should be stressed out that topical SAIDs treatment, preputioplasty or the combination of both may prevent foreskin amputation which protects the prepuce and is of great importance in sexual intercourse.

REFERENCES