

# Acceptability and outcomes of foreskin preservation for phimosis: An Indian perspective

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## ABSTRACT

**Aim:** Understanding the Indian perspective, effectiveness, and acceptability of prepuce conservation in children with phimosis. Circumcision is performed and recommended far too often for nonphysiological phimosis. Will a less radical approach be acceptable in the subcontinent? **Method:** A two-arm study with the first arm as KAP (knowledge, attitude, and practice) study ( $n = 502$ ). The second arm recruited deserving boys ( $n = 47$ ) with symptomatic phimosis (see inclusion criteria). Betamethasone ointment was applied twice daily over the foreskin and gently massaged to stretch the phimotic band. Those who failed were offered lateral preputioplasty or circumcision. Religious beliefs influence attitude and practice and these were looked at with subgroup analysis. **Results:** Most (85%) knew that circumcision was not the only treatment for phimosis. Though many parents (93%) knew the importance of foreskin cleanliness, few practiced it. The success of the steroid application was 81% ( $n = 38/47$ ). Eight underwent preputioplasty. Minor discomfort as morbidity was noted. All parents were able to completely retract the foreskin of their children by the end of one month and were happy about the cosmetic result. **Conclusions:** KAP data on foreskin health is not available in the subcontinent, and this is a landmark study. Religious belief and community identity play a strong role in decisions related to foreskin preservation. Prepuce hygiene and knowledge about the usefulness of the foreskin is poor. The combination of medical and surgical methods of conserving the prepuce was effective. A high rate of success and the non-mutilating cosmetic result of prepuce preservation were acceptable to these parents.

**Keywords:** Circumcision, foreskin, phimosis, religious beliefs

## Introduction

There exist clear religious and medical reasons for circumcision.<sup>[1]</sup> However, circumcision is often offered when the prepuce can be preserved. Prepuce or foreskin preservation by gentle steroid cream dilatations or a preputioplasty is well established.<sup>[2-6]</sup> We aim to study the Indian parent's knowledge, attitude, and practice (KAP) about foreskin in male children—its preservation, usefulness, and hygiene. Mindful of the cultural diversity of the Indian

subcontinent—we study this with a background of different religious practices and cultural identity. In patients who qualify, an effort is made to evaluate the effectiveness and acceptability of prepuce conservation in children with phimosis. It is our hope that children without a clear religious or medical indication for circumcision can be counseled regarding the options to preserve the prepuce.

The foreskin is an integral part of the penis. In infants and young children, it primarily serves to protect the sensitive glans and the urethral meatus, as evidenced by an increased incidence of meatal ulceration and stenosis following routine neonatal circumcision. In adults, it also performs an erogenous function as it is a specialized junctional mucocutaneous tissue.<sup>[7]</sup> However, the usefulness and importance of the foreskin are perceived differently by different cultures. There are communities that

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prefer foreskin preservation and there are those who believe in its removal on religious grounds.

Male circumcision is a commonly performed surgical procedure worldwide. The prevalence of which has varied with time and the geographical region as per national policies.<sup>[8]</sup> There are many theories about the origin of male circumcision, the birth of which is said to date back several thousands of years. Circumcision was performed for various nonmedical and medical reasons but slowly became an established medical practice since the rise of modern surgery in the 19<sup>th</sup> century.<sup>[9]</sup> Currently, the overall global prevalence of male circumcision is 37–39% and approximately half of these are performed for religious and cultural reasons.<sup>[10]</sup> Medical indications for circumcision include pathological phimosis, trauma to the foreskin, recurrent scarring balanitis, balanitis xerotic obliterans, recurrent urinary tract infection in children with underlying urinary tract abnormality and paraphimosis.<sup>[11]</sup>

Several factors shape individual and group perceptions about foreskin and its preservation or removal such as religious, cultural, ethnic, geographical, political, medical, and educational factors.

Though these factors and the perceptions that arise thereof are well studied in many parts of the world, sparse studies exist from India.<sup>[12–15]</sup> General physicians and family medicine doctors are often the first health care practitioners trusted by families to advise them on prepuce hygiene or referral for circumcision. Based on the results of this large cohort, primary care physicians can offer simple conservative therapy for appropriate children and decide who requires a referral for surgical therapy. Our unique cultural and religious diversity leaves health care professionals unclear on how to counsel parents respecting cultural identity. Hence, this study was felt essential and adds useful information for primary care providers dealing with Indian communities.

## Methods

The study was conducted in a tertiary care pediatric surgical center in south India catering to patients coming from all over the country. Appropriate ethical clearance and institutional review board clearance was obtained. The study was conducted from May to September 2018. The trial was divided into two arms; a KAP arm (arm “A”) and an intervention arm (arm “B”). In arm “A,” the participants (parents of male children brought to the pediatric surgery department) were administered a de-identified questionnaire with both objective graded and open-ended questions. 502 individuals were included in this arm of the study after appropriate informed consent.

The questionnaire was prepared with both qualitative and quantitative questions to assess KAP. Demographic details of the

**Table 1: Tabulated results KAP (knowledge, attitude, and practice)**

	CNPRC (n=439)	CPRC (n=63)
1) Is there anyone in the family whose foreskin has been removed?		
Yes	n=61 (14%)	n=63 (100%)
No	n=370 (84%)	-
Don't know	n=8 (2%)	-
2) Is foreskin useful?		
Yes	n=132 (30%)	n=1 (1.6%)
No	n=111 (25%)	n=37 (59%)
Don't know	n=196 (45%)	n=25 (40%)
3) Will foreskin removal cause any problems?		
Yes	n=66 (15%)	n=1 (1.6%)
No	n=152 (35%)	n=54 (86%)
Don't know	n=221 (50%)	n=8 (13%)
4) Is circumcision the only treatment option for phimosis?		
Yes	n=50 (11%)	n=16 (25%)
No	n=374 (85%)	n=39 (62%)
Don't know	n=15 (4%)	n=8 (13%)
5) Should all boys undergo circumcision?		
Yes	n=90 (20%)	n=53 (84%)
No	n=258 (59%)	n=7 (11%)
Don't know	n=91 (21%)	n=3 (5%)
6) Is it necessary to clean under the foreskin regularly?		
Yes	n=407 (93%)	n=40 (64%)
No	n=12 (3%)	n=19 (30%)
Don't know	n=20 (4%)	n=4 (6%)

**Table 2: Responses as per gender**

	Men (CNPRC) n=169	Women (CNPRC) n=270
1) Is foreskin useful?		
Yes	n=25 (15%)	n=26 (9%)
No	n=139 (82%)	n=235 (87%)
Don't know	n=5 (3%)	n=10 (4%)
2) Will foreskin removal cause any problems?		
Yes	n=20 (12%)	n=46 (17%)
No	n=66 (39%)	n=86 (32%)
Don't know	n=83 (49%)	n=138 (51%)
3) Is circumcision the only treatment option for phimosis?		
Yes	n=3 (2%)	n=23 (9%)
No	n=127 (75%)	n=156 (58%)
Don't know	n=39 (23%)	n=91 (33%)
4) Should all boys undergo circumcision?		
Yes	n=45 (27%)	n=45 (17%)
No	n=96 (57%)	n=162 (60%)
Don't know	n=28 (17%)	n=63 (23%)
5) Is it necessary to clean under the foreskin regularly?		
Yes	n=161 (95%)	n=246 (91%)
No	n=3 (2%)	n=9 (3%)
Don't know	n=5 (3%)	n=15 (6%)

participants such as sex, religion, and education were collected. The relationship of the participant to the child (whether father or mother) was noted. They were divided into two groups depending on whether they belonged to a community that practiced religious circumcision or not; CNPRC—communities' *not practicing* religious circumcision and CPRC—communities *practicing* religious circumcision. There were six questions that were designed to obtain caregivers' views about foreskin use, foreskin removal, treatment options for phimosis, and foreskin hygiene. The response to each question was graded. Open-ended questions were asked to clarify opinions for a qualitative assessment.

In arm "B," boys from CNPRC with symptomatic phimosis, not mandating circumcision were enrolled in the study after obtaining consent from their parents. 47 boys satisfied the inclusion criteria. They were given a 2-week course of betamethasone ointment (mild steroid ointment) for topical application twice daily over the tight ring of the foreskin and taught how to gently pull back the foreskin and clean stuck smegma. These children were reassessed after 2 weeks. Surgical intervention was offered if the foreskin remained un-retractable at the end of 2 weeks. The parents could choose between lateral preputioplasty (foreskin preserving surgery) and circumcision.

### Procedure (Lateral preputioplasty)

The procedure was done as a day-care procedure. The following were the steps for a lateral preputioplasty. The prepuce is retracted to expose the glans completely. The stenotic ring that limits retraction of the prepuce is noted and two longitudinal incisions are made at 3 and 9 "o" clock positions over the stenotic ring on the retracted prepuce to divide it. The stenotic ring is, hence, widened allowing easy retraction of the foreskin. The incisions are closed transversely using absorbable sutures. The prepuce is pulled back to its original position, ensuring no bleeding. No frenuloplasty is required in the patients who underwent the procedure, though this could be done if required.

Children who underwent preputioplasty were followed up at regular intervals. Follow-up was scheduled at 2, 7, and 30 days after the procedure. Parents were taught to do once-daily foreskin retraction and Neosporin ointment application on the suture line beginning 2 days after the procedure. They were required to answer post-op questionnaires at 7 and 30 days reviews to obtain their feedback about the procedure. The responses to the questions were graded.

## Results

### Arm "A"—KAP study

The majority of the participants belonged to communities *not practicing* religious circumcision - CNPRC ( $n = 439$ , 87%) and the remaining belonged to community *practicing* religious circumcision—CPRC ( $n = 63$ , 13%). 60% of the participants were women ( $n = 302$ ) and the rest were men ( $n = 200$ ). There

was an even distribution of educational status among the respondents. Approximately a third were college graduates (32%,  $n = 159$ ), another third (41%,  $n = 208$ ) had secondary school and

**Table 3: Qualitative responses tabulated**

How is foreskin useful?	
1	Protects against infection
2	Protects against injury
3	Has sexual use
4	Appears cosmetic
Will foreskin removal cause any problems?	
1	Causes difficulty in passing urine
2	Results in sexual problems
3	Causes pain and infection
4	Protection offered by foreskin is lost
5	Changes normal appearance
6	Causes sterility
Should all boys undergo circumcision?	
(Those in favor of circumcision other than cultural and religious reasons)	
1	Prevents phimosis
2	Helps in sexual intercourse
3	Improves hygiene (easy to clean)
4	Prevents diseases and protects from illnesses
5	Helps in urination
6	Prevents penile cancer
7	Improves health and increases strength
8	Prevents sexually transmitted diseases
9	Helps in growth of the child
10	Increases fertility
11	Reduces urinary infections
Should all boys undergo circumcision? (responses against doing circumcision)	
1	Against their religion or culture
2	Loses identity of the religion to which the individual belongs
3	The boy should decide about circumcision after he grows up
4	Procedure is painful and causes infection and hence should not be done
5	Penis with intact foreskin is more cosmetic
6	Removal of the foreskin changes the natural appearance
7	Foreskin is very sensitive and hence should not be removed
Reasons for not practicing regular foreskin hygiene on their sons	
1	Child is still an infant
2	Has phimosis
3	Concern about pain and injury
4	Child is not cooperative
5	Was not advised about foreskin hygiene by elders or doctors
6	Concerns about the child developing a wrong habit
7	Should be taught only when the son has attained teenage

**Table 4: Involvement of parents in cleaning the foreskin**

Is it necessary to clean under the foreskin regularly?	Men (CNPRC + CPRC) $n=200$	Women (CNPRC + CPRC) $n=302$
How many said yes?	$n=181/200$ (91%)	$n=266/302$ (88%)
How many actually practiced it?	$n=72/181$ (40%)	$n=176/266$ (66%)

CNPRC: communities' not practicing religious circumcision; CPRC: communities practicing religious circumcision

intermediate level education. The rest were educated till primary school and less or did not provide this information.

Questions were categorized to assess KAP about the foreskin. A pilot study was initially done to validate the KAP questionnaire. The questionnaire was administered by the primary investigator and the responses tabulated [Tables 1 and 2]. The common qualitative responses to questions on attitude and knowledge are shown in Table 3.

Only 14% ( $n = 61$ ) of CNPRC had a family member who had been circumcised for a medical indication. Most parents irrespective of educational background, religious practice, or gender had little or no knowledge about the use of the foreskin (70% in CNPRC and 98% in CPRC). In CNPRC 35% felt that circumcision was safe and without complications, but only 20% of these parents would advocate circumcision of all boys. Most (85%) of them knew that there were options to treat symptomatic phimosis other than circumcision and they would not hesitate to consult a specialist for the same. Interestingly, 62% of CPRC also knew of options to treat phimosis other than circumcision and only 25% felt that circumcision was the only treatment for phimosis. Keeping their son's foreskin clean was felt essential by most caregivers, though only 46% from CNPRC and 33% from CPRC actually practiced it. Women (66%) were better at ensuring foreskin hygiene on their sons [Table 4].

### Arm "B"—intervention arm

Children from CNPRC with symptomatic phimosis were enrolled. 47 boys (Mean age 31 months; range 4 months to 11 years) were recruited after informed consent. All recruited children were started on a mild steroid massage as described. At the end of 2 weeks, 38 boys had a retractable foreskin and required no further treatment. The remaining nine of them had persistent phimosis. The parents of these nine children were counseled about the trial and given an option between lateral preputioplasty (foreskin preserving surgery) and circumcision. A chance to crossover to circumcision was offered to all parents post preputioplasty with no financial implications to them if they so choose.

One of these nine children was subsequently lost to follow-up after being found temporarily unfit for anesthesia. The remaining eight boys underwent day-care lateral preputioplasty. They were followed up at 2, 7, and 30 days after surgery. Parents were taught to retract foreskin from the 2<sup>nd</sup> post-op day. The parent's feedback and concerns were noted.

Pain, bleeding, difficulty in urination and difficulty in retracting the foreskin were either absent or only mild in the majority of children at the end of 1 week. One of the boys had difficulty in retracting the foreskin due to pain, but the same subsided by the end of 1 month. Six of the eight boys regained their normal activities immediately after surgery. In the remaining

**Table 5: Patient selection criteria**

#### Inclusion criteria:

- Boys with unretractable prepuce caused by pathological phimosis.
- Boys with a past history of recurrent balanoposthitis.
- Boys with ballooning of the prepuce while voiding.
- Non-infant boys with un-retractable prepuce caused by physiological phimosis whose parents request to be able to retract the foreskin for cleaning.

#### Exclusion criteria:

- Boys with un-retractable prepuce caused by physiological phimosis.
- Boys with phimosis secondary to suspected balanitis xerotica obliterans.
- Boys with underlying urinary tract abnormality or neurogenic bladder.
- Boys whose parents request circumcision for cultural and religious reasons.

two, return to normal activities was delayed by more than 1 week due to pain. Cosmesis was considered as excellent by four and good by another four parents. After the resolution of edema, the penis and prepuce looked similar to the preoperative status. All parents and children were able to freely retract the foreskin over the glans penis without pain by 30 days [Table 5]. There was no post-op wound infection. No prophylactic antibiotics were prescribed.

## Discussion

The Indian community is known for its rich diversity in religious, cultural, social, economic, educational, and other fields. The major religions of India are Hinduism (79.8%), Islam (14.23%), Christianity (2.3%), and Sikhism (1.7%) followed by the others as per the 2011 national census data.<sup>[16,17]</sup> The practice of circumcision is mandatory within certain religious communities such as the Muslims and the Jews.<sup>[9,18]</sup> Though it would stand to reason that the attitude to foreskin related health is influenced by culture, this is not well studied.<sup>[14]</sup> Though data exist from other Western communities, there is scant data from the Indian subcontinent. Documenting the perceptions of communities that do not practice religious circumcision regarding foreskin hygiene and health helps medical faculty communicate and make realistic plans for the management of these children. They may often be counseled toward circumcision when more viable options exist before the need to completely remove the foreskin.

The prevalence of circumcision varies widely across the world. It is high in countries where the majority of people belong to a community that favors religious circumcision or where the national policies support circumcision.<sup>[10,19]</sup> Its prevalence is 13.5% in India.<sup>[10]</sup> In our study, the prevalence among members not practicing religious circumcision was 14%. Circumcision for medical indications is the reason for foreskin removal in this group and may reveal a biased sampling of hospital subjects.

In this study, it was noted that irrespective of religious beliefs, education or sex of parent most Indian parents feel that the foreskin has no use. Only one-third of the individuals from communities' not practicing religious circumcision had some

idea about uses of the foreskin. Also, one-third of the individuals from this community felt that circumcision is a safe operation and 20% of the parents favored compulsory circumcision of all boys as they believed that it improves penile hygiene; but, however, the rest preferred foreskin preservation as its removal would result in loss of cultural identity of the individual. The majority of the members from both communities were aware of options to treat phimosis other than circumcision.

Though the knowledge of maintaining foreskin hygiene is important in most Indian parents' minds, only a little over half actually practiced it. In this study, it was found that mothers were more involved in maintaining the foreskin hygiene of their sons than their fathers. These data suggest an avenue for simple counseling by clinicians in outpatients to encourage parents to avoid balanitis and poor preputial hygiene. The study is limited by being a hospital-based study, indicating responses of parents who are not in the community when responding; however, the results should be relevant when knowledge and attitude are being assessed.

This study was able to demonstrate clearly that circumcision could be avoided in a large number of children. This non-mutilating treatment of phimosis was well accepted by members from communities' not practicing religious circumcision. The combination of medical and surgical methods of conserving the prepuce in the treatment of phimosis was effective with a good rate of success.<sup>[2,3,20-23]</sup> and with minimal or no morbidity. Though preputioplasty has had good acceptance in European communities where routine circumcision is not practiced,<sup>[24,25]</sup> the awareness and acceptability in the Indian population is limited. The process is simple, can be readily taught by pediatricians and will avoid the anxiety and complications of a formal circumcision. The needless loss of foreskin with its associated morbidity in children belonging to communities who prefer foreskin preservation with a good to excellent cosmetic result is a good case for a change in practice.<sup>[26]</sup>

## Conclusion

This unique study from India sheds light on the Indian perspective about foreskin usefulness, its preservation or removal in the background of the religious and cultural diversity of our country. Primary care physicians are often trusted by families to help direct care for children under their care. A simple nonoperative therapy for phimosis such as reassurance, steroid therapy, or referral for a less morbid preputioplasty is an acceptable option for parents and children in the Indian community. Understanding who does and doesn't require a surgical therapy for foreskin problems and appropriate health education will bolster parental confidence in their family physicians as well as reduce unnecessary referrals for circumcision in children who do not require them. The majority of Indian parents are unaware of the purpose of their children's foreskin. They are, however, aware that options exist in the treatment of un-retractable foreskin other than circumcision and do seek medical advice. People from communities' not practicing

religious circumcision would prefer foreskin preserving methods as opposed to foreskin removal for the treatment of symptomatic phimosis in their children.

Circumcision can be reserved for a very limited number of children who fail medical steroid therapy for phimosis and prepuce preservation techniques result in high satisfaction from parents in communities' not practicing religious circumcision.

## Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

Institutional ethics committee approval was obtained - IRB ref no. 11064 dated 20/12/2017 from the Ethics and IRB committee Christian Medical College, Vellore.

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## Conflicts of interest

There are no conflicts of interest.

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