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A Comparative Study of Management of Phimosis By Preputioplasty and Circumcision

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Abstract

Introduction: Phimosis is defined as a condition in which the prepuce cannot be retracted over the glans penis, usually treated by circumcision. A minimal surgical techniques have been proposed preputioplasty for prepucial relief to avoid circumcision. *AIMS/Objectives*: Prospective Comparative Study Of Management Of Phimosis By Techniques Of Circumcision And Preputioplasty in relation to: Bleeding, Injury to urethral meatus. Injury to glans, Post op swelling of glans / prepuce, Time taken for the procedure,Time taken for complete healing, Post operative results. *Methods:* It is a prospective comparative study in which 100 patients who underwent preputioplasty and 100 were subjected to circumcision. Indications, techniques, and immediate outcomes were documented. We have subsequently followed up patients to look for outcome and patient's satisfaction. *Result:* The average duration of preputioplasty was from 10 to 20 min without intraoperative complications. Post operative edema was more with preputioplasty. The outcome was good in preputioplasty as compared to circumcision. All of the patients had retractable prepuce with no functional problems. None of the patients required a redo procedure or circumcision. *Conclusion:* Preputioplasty is a safe and simple alternative to more radical procedure of circumcision.

Keywords: Phimosis; Circumcison; Preputioplasty.

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Introduction

Phimosis is defined as a condition in which the prepuce cannot be retracted over the glans penis. The term "phimosis" is derived from Greek word meaning "closure". It can be physiological, as happens in infancy and childhood, or pathologic. Physiological phimosis is most common in patients up to 3 years of age, but it often extends up to pre pubertal age group.

Pathological phimosis results from inflammatory or traumatic injury to the prepuce resulting in an acquired inelastic scar that prevents retraction [1]. Forceful disruption of physiologic adhesions between glans and prepuce in infants encourages pathologic phimosis.

The prepuce envelops the glans as a variant of mucocutaneous tissue presenting with several functions including protection of the infant's glans from contamination with feces and ammonia from urine in diapers and to protect the glans from any trauma.

The foreskin works like an eyelid, for protection and hygiene. The foreskin protects the delicate glans of the penis and puts the urethra at a distance from its environment. It is a double fold of outer skin and inner mucosal layers which offers two layers of protection.

Natural secretions of oil are achieved by sebaceous glands which are abundant in the foreskins inner lining, these are not present in the glans. They are also present in the eye lid and perform the same function in both places. They secrete the oils necessary to keep the glans surface soft, moist, smooth, warm, sensitive, and with a healthy glistening red or purple color [2].

This moisturizer also maintains pH balance, and optimal cleanliness. This is required to keep the

surface of the glans healthy and clean via the cleaning effects of mucous secretions. The glans is meant to be an internal organ covered and protected from the outside world.

Circumcision is one of the oldest and probably one of the commonest surgical procedures worldwide. Although it is usually performed for a religious purpose, the main surgical indication is organic-narrowing of the preputial orifice.

Some of the surgical conditions where circumcision is indicated are phimosis following a) balanitis, b) posthitis , c) paraphimosis, d) venereal disease and e) penile cancer [3].

To understand the genesis of phimosis, it is imperative to understand the development, function and growth of prepuce of normal male to avoid unnecessary circumcisions being performed on young boys. A newborn boy has a long prepuce with a narrow tip. Retraction is not possible in most of the infants because the narrow tip does not pass over the glans penis, since the inner mucosal surface of the prepuce is fused with the underlying mucosal surface of the glans-penis at birth which generally separates by the age of 3 to 5 years, but in some patients it may separate only by 10 years of age hence lesser procedure like preputioplasty may be better option than circumcision [4].

The establishment of 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 genitourinary system in uncircumcised males resulted in review of non retractile foreskin management.

Hence this study is being undertaken to study the management of phimosis by preputioplasty and compare the results of this procedure with circumcision.

Aims and Objective

AIMS

Prospective Comparative Study Of Management Of Phimosis By Techniques Of Circumcision and Preputioplasty.

Objective

Incidence of phimosis and its severity in relation to

- Partial retraction of prepuce due to preputial adhesions or Retraction with difficulty
- Inability to retract
- Ballooning of prepuce

Post operative result Comparison of the procedure of preputioplasty and circumcision

Material and Methods

Place of Study: Dr.D.Y.Patil Medical College & Hospital and Research Centre, Pimpri,Pune 18.

Type of Study: Prospective Study

Period for Data Collection: 2 years

Period taken for Data analysis and reporting:-6 months.

Sample Size: 200 cases

- 100 cases of Phimosis subjected to preputioplasty (study group A)
- 100 cases of Phimosis subjected to circumcision (control group B)

Informed & written consent of the patients/parents were taken prior to the study.

Inclusion Criteria

All patients irrespective of any age reporting to surgical OPD with phimosis will be included in the study.

Exclusion Criteria

- Phimosis but without a history of local symptoms were reassured and excluded.
- Hypospadiasis
- Epispadiasis
- Urethral meatal stenosis,

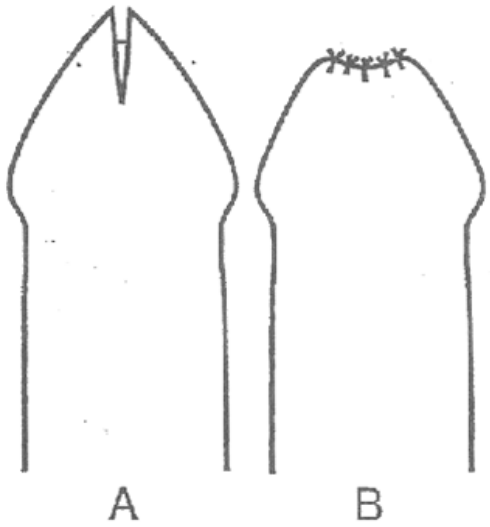
Plan of Study

1. Detailed clinical history along with clinical examination including collection of any smegma, opening of prepuce, retraction of prepuce, ballooning and difficulty in micturition.
2. Patient underwent necessary investigation like complete blood count, urine routine and microscopy, bleeding time, clotting time.
3. First patient was selected on the basis of lucky draw and then alternative cases were allotted for circumcision and preputioplasty
4. All the cases underwent surgery under suitable anesthesia.

5. Prophylactic antibiotics injection Cefixime 50 mg /kg body weight was given intravenously at the time of induction.

Procedures

In Preputioplasty group- Two laterally placed longitudinal incisions around 1 cm were made in the prepuce protecting the glans. The outer skin and inner mucosal lining of the prepuce were sutured transversely using absorbable suture material to expose the glans and the external urethral meatus.



A. Laterally placed longitudinal incisions around 1 cm

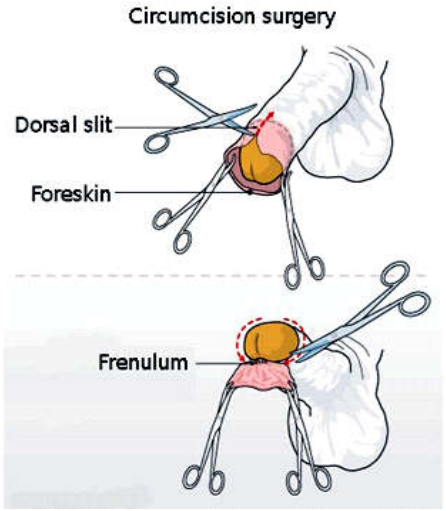
B. Sutured transversely.

In Circumcision Group

Preputial orifice were stretched to expose the glans. The inner lining of the foreskin (preputial epithelium) were bluntly separated from the glans. A dorsal slit was made on the preputial skin down, after crushing with an artery forcep. The crushing helps to reduce bleeding. The penile skin incision was then deepened to the level of buck's fascia. The preputial skin was resected leaving a 0.5 cm sleeve proximal to the corona.

Caution was exercised at this stage to avoid injury to the urethra and glans. The ventral part of the penile skin incision was deepened only to the level of dartos fascia initially. Then bucks fascia was carefully divided under clear vision.

This way injury to the urethra was avoided. Hemostasis was secured by ligating the bleeding vessels, starting with the frenular artery. The edges of the foreskin were stitched.



Post operative patients in both group were continued with the antibiotic injection cefixime 50mg /kg body weight intravenously 12 hourly for two more doses and analgesics paracetamol 15mg/kg iv 8 hourly for 24 hour and then continued with oral doses for three days.

Check dressings were done under all aseptic precaution after 24 hours of surgery and mupirocin ointment was applied over operated area. The area was left open subsequently for observation, no occlusive dressing was done.

Operated area were checked on 2nd, 3rd, 5th , 7th for any sign of inflammation (redness, swelling, local rise of temperature, induration and discharge).

Follow -up

a. After 7 days patients were followed up on monthly basis for next six months.

b. At the time of follow up, following signs were looked for

- Any evidence of infection
- Any redness, swelling, retraction of prepuce, tenderness while retracting back the prepuce , operated site.
- Any evidence of bleeding.

c. Patients were encouraged to retract the foreskin once comfortable to prevent reformation of preputial adhesions.

Results and Observation

The study was conducted over a period of 2 years and the following observations were recorded, Total

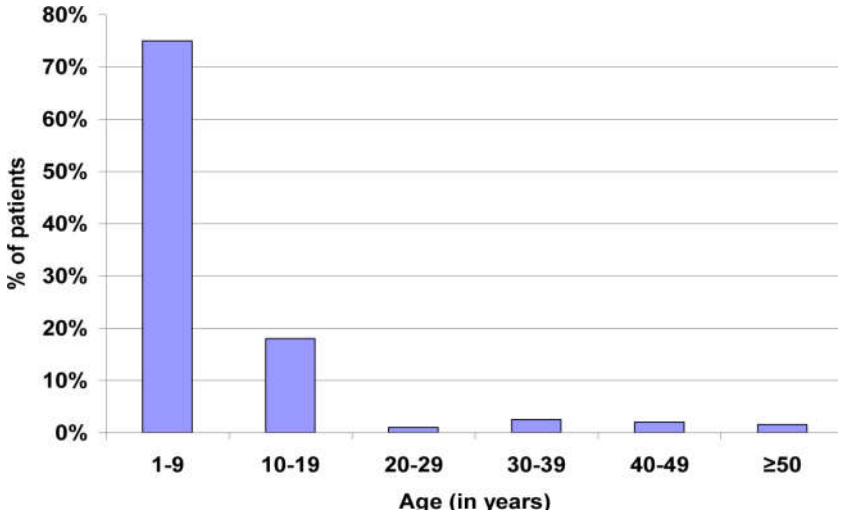
200 cases have been done, 100 cases in group A (preputioplasty) and 100 cases in group B (circumcision).

The mean age (mean±S.D.) of the patients was 9.14±7.70 years with range 2 - 75 years and the median age was 7 years.

Test of proportion showed that the proportion of the patients in the age group 1 - 9 years (75.0%) were significantly higher than other age group (Z= 22.34; p<0.0001). Only 1.5% was in with the age ≥ 50 years.

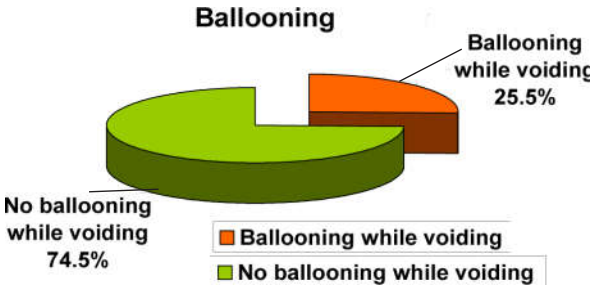
Table 1: Age distribution of the patients

Age Group (in years)	Number	%
1-9	150	75.0%
10-19	36	18.0%
20-29	2	1.0%
30-39	5	2.5%
40-49	4	2.0%
≥50	3	1.5%
Total	200	100.0%



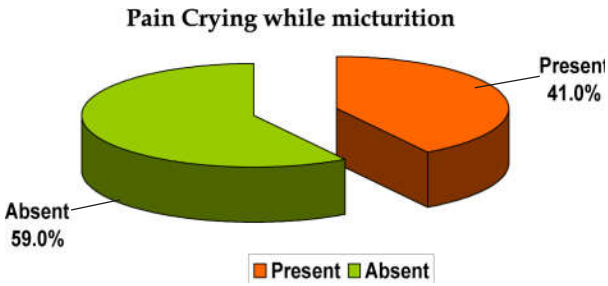
Ballooning

Out of 200 patients, 51 cases (25.5%) have ballooning while voiding which was significantly lower than that of not having ballooning (74.5%) (Z=6.92; p<0.00001).



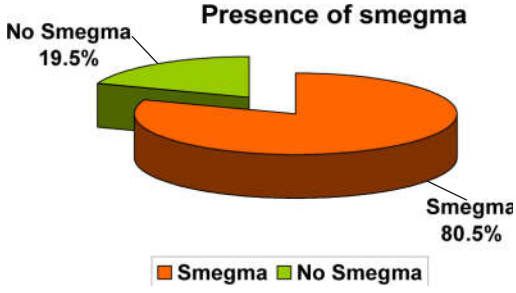
Pain / Crying While Micturition

41% of patient cry/pain while micturition which was significantly lower (Z=2.54; p=0.0111).



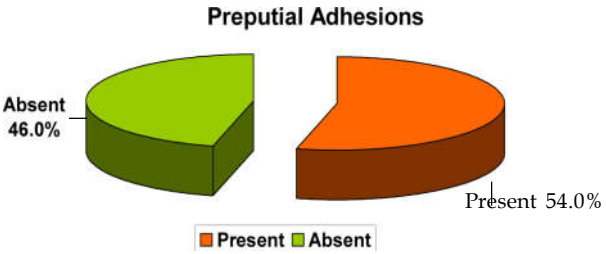
Presence of Smegma

Out of 161 patients, 80.5% presented with presence of smegma which was significantly higher (Z=8.62; p<0.0001).



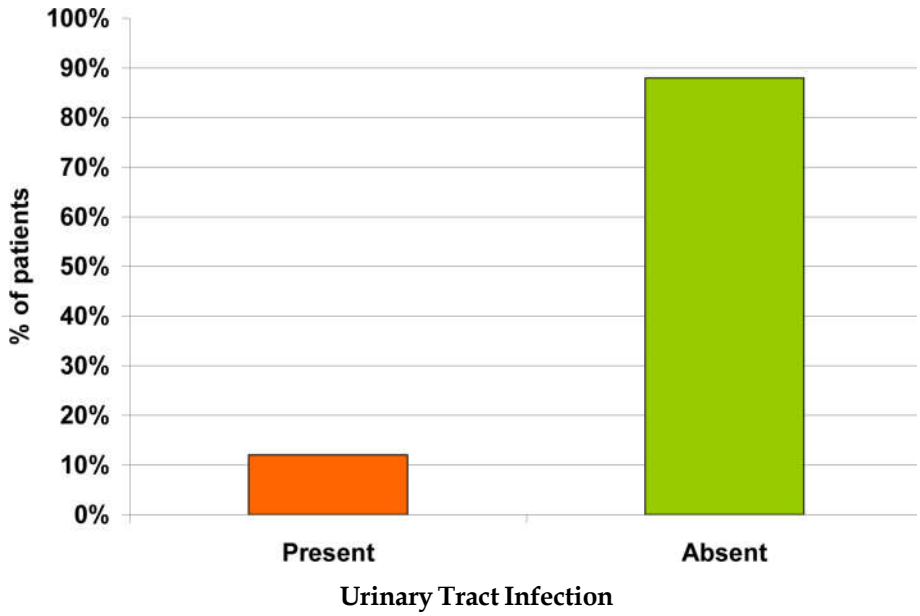
Preputial Adhesions

Out of 200 patients,108 (54%) exhibited preputial adhesions which was not significant (Z=1.31; p=0.19).



Urinary Tract Infection

Out of 200 patients, 24 (12.0%) were suffering from urinary tract infection and on investigation there total leucocytes counts were more than 10,000 cumm and on routine urine investigation there were presence of pus cells and RBC.



Duration of Surgery in Minutes

Table 3: Comparison of duration of surgery of the two groups

Duration of surgery (in minutes)	Group -A (Preputioplasty) (n=100)	Group B (Circumcision) (n=100)	t_{198}-value	p-value
Mean ± s.d.	14.33±3.01	23.91±9.67	9.45	<0.0001*
Median	14	22.5		
Range	10 - 26	10 – 38		

* Statistically Significant,t-test showed that the mean durartion fo surgery of Group-B was significantly higher than that of Group-A ((t_{98}=9.45; p<0.01).

Post Operative Duration of Stay in Hospital (in Days)

Table 4: Comparison of post operative duration of stay in hospital (in days) of the two groups

Post operative duration of stay in hospital (in days)	Group -A (Preputioplasty) (n=100)	Group B (Circumcision) (n=100)	t_{198}-value	p-value
Mean ± s.d.	1.00±0.61	2.5±0.84	14.44	<0.0001*
Median	1	2.0		
Range	1 - 2	2 - 3		

Post -Op Observations

Post-operative complications in 1st 24 hours

Post operative follow up	Group A Preputioplasty N=100	Group B Circumcision N=100	Z-value	p-value
Post-operative complications in 1st 24 hours				
Edema	76 (76%)	25 (25%)	7.21	<0.0001*
Soakage	0	12 (12%)	3.57	<0.0001*
unable to retract back prepuce	12 (12%)	3 (3%)	2.41	0.0160*
Any sign of inflammation	0	0	0.01	0.99 NS
Difficulty in micturition	2(2%)	12(12%)	2.77	0.0056*
injury to urethral meatus	0	0	0.01	0.99 NS
injury to glans	1(1.0%)	10 (10%)	2.79	0.0053*

Post-operative complications After 5th day

Post operative follow up	Group A Preputioplasty N=100	Group B Circumcision N=100	Z-value	p-value
After 5 days				
Edema	8(8%)	6(6%)	0.55	0.5823
Any sign of inflammation	0	3(3%)	1.74	0.0819 NS
Difficulty in micturition	0	6(6%)	2.48	0.0131*

Post-operative complications After 7th day

Post operative follow up	Group A Preputioplasty N=100	Group B Circumcision N=100	Z-value	p-value
After 7thdays				
Edema	6(6%)	0	2.48	0.013*
Any sign of inflammation	0	3(3%)	1.74	0.0819
Difficulty in micturition	0	6(6%)	2.48	0.0131*

Post-operative complications: After 14th day

Post operative follow up	Group A Preputioplasty N=100	Group B Circumcision N=100	Z-value	p-value
After 14th days				
Any sign of inflammation	0	0	0.01	0.99 NS
Suture line (Crust formation)	0	2(2%)	1.42	0.1556 NS
Difficulty in micturition	0	1(1%)	1.01	0.3125 NS

Post-operative complications After 3 month

Post operative follow up	Group A Preputioplasty N=100	Group B Circumcision N=100	Z-value	p-value
After 3 month				
Inability to retract	0	0	0.01	0.99 NS
Suture line (Crust formation)	0	2(2%)	1.42	0.1556 NS
Difficulty in micturition	0	0	0.01	0.99 NS

Discussion

Circumcision is one of the oldest and still one of the commonest surgical operations worldwide. As several authors have recently noted, the foreskin is often removed unnecessarily, when there is no true fibrous phimosis. Even when there is genuine narrowing, phimosis in children often lends itself to the lesser procedure of preputioplasty.

Preputioplasty is a surgical procedure which is performed to widen the foreskin to enable it to be pulled back. The foreskin is too narrow which is due to a tight ring of tissue called a 'stenosis' which prevents it from being retracted.

There are good reasons for avoiding circumcision if possible. Though one of the most commonly performed operations worldwide it still carries substantial morbidity including haemorrhage, meatal ulceration and stricture. In addition there is some evidence of late adverse effects on sexual function. The foreskin is suspected to be important in terms not only of male sensation but also of female enjoyment of intercourse.

This study compared the incidence, symptoms and post-operative complications after preputioplasty and circumcision in patients presenting with phimosis.

In our study, age wise distribution of phimosis, 150 (75%) patients were in the age group of 1 to 9, 36 in the group of 10 to 19, 2 in 20 to 29, 5 male in 30 to 39 group, 4 males in 40 to 49 years age group and 3 patients in ≥50 years age group.

The mean age (mean±S.D.) of the patients was 9.14±7.70 years with range 2 - 75 years and the median age was 7 years.

Anita Jagdish Kandi et al (2015), observed that 60% of the children with phimosis were less than 5 years old. The mean age of children in the study was 6.3± 0.43 years.

Ming-Chung Ko; et. al has reported in his studies by the age of 13 years, very few boys (some 0.3%) still had an unretractable prepuce.

In our study, ballooning was present while voiding in 51 patients (25.5%) which was statistically significantly(Z=6.92; p<0.00001).

Ramesh Babu et al [21] reported 33% patient had phimosis with ballooning [7]. Ballooning is an indication that the normal separation of the foreskin from the glans penis has occurred. Ballooning is a transient condition that goes away as the prepuce continues its natural growth and development and the opening at the tip further enlarges.

Babu *et al.* also reported that ballooning does not interfere with voiding. Ballooning is not injurious, and it is not a cause for concern. Ballooning therefore is not an indication for circumcision.

In our study, 41% of patient cried during micturition.

Pradeep Sivaraj et al showed patients cried while micturition in 25.3% of the children with phimosis.

In our study, Out of 200 patients 161(80.5%) were having smegma ,

Wright et al, has reported little smegma is produced during childhood in 76% cases, although the foreskin may contain sebaceous glands, production of smegma increases from adolescence until sexual maturity when the function of smegma for lubrication assumes its full value, and from middle-age production starts to decline and in old age virtually no smegma is produced.

In our study, out of 200, 108 (54%) patient were having preputial adhesions .

Sandip Kumar Rahul et al [57] has observed that 87.5% school going children presented with preputial adhesions. At birth, only four percent have completed this separation; by 6 months, 20%; by 3 years, 90 percent and by 17 years, 99 percent. So, Physiological preputial adhesion (PPA) is expected to resolve on its own keeping this natural process of separation in mind. However, urinary symptoms of thin stream, difficulty in voiding and urinary tract infections can result if preputial adhesions impede the urinary flow. Also, infection of smegma underneath the foreskin and balano-posthitis can occasionally occur. It is this small group of patients with PPA that would benefit from preputioplasty and proper after care by the parents.

In our study, time required for preputioplasty (average 14:30 minutes) was significantly less than circumcision (average 33 minutes).

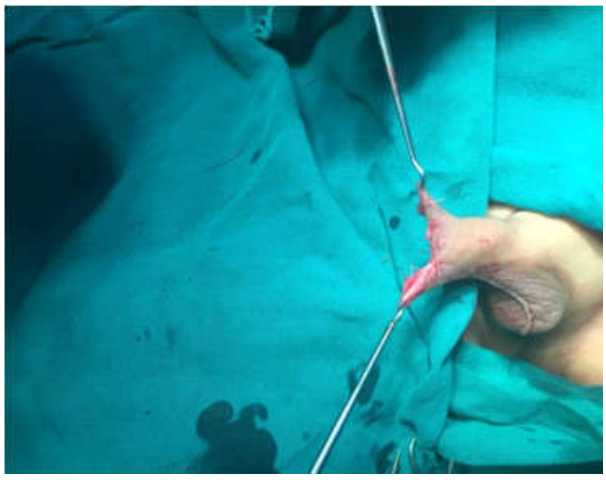
In our study, average stay in hospital was significantly less in preputioplasty (average 1 day) as compared to circumcision (average 2.5 days).

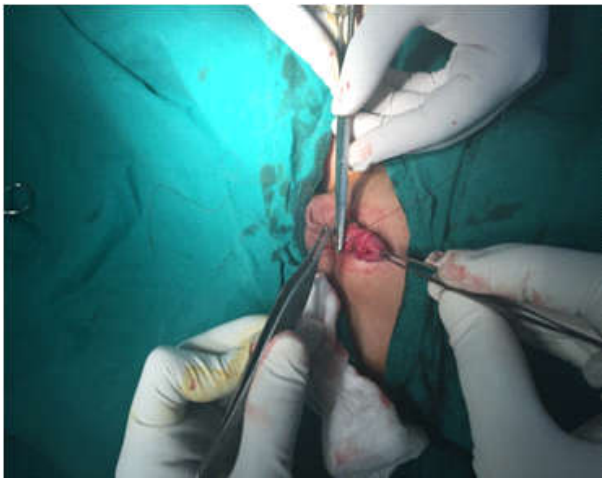
In our study, Post operative oedema was present in both groups but somewhat higher in group A preputioplasty group (76%) than in group B (25%), suggesting that post-operative oedema occurs more after preputioplasty mainly due to oedema of residual skin which was left in situ (p value <0.0001 i.e. statistically significant). Patients were treated by application of glycerine- MgSo4 dressing.

In the our study, the post-operative crying while micturition/pain was present in 12% patients of group A and 2% patients of Group B. This was due to excision of whole preputial skin in circumcision. Analgesics were sufficient to manage the problem. Similarly, in the study conducted by Peter et. al, distress in the first 24 hours was dramatically greater in the circumcision group, despite the use of nerve blocks.

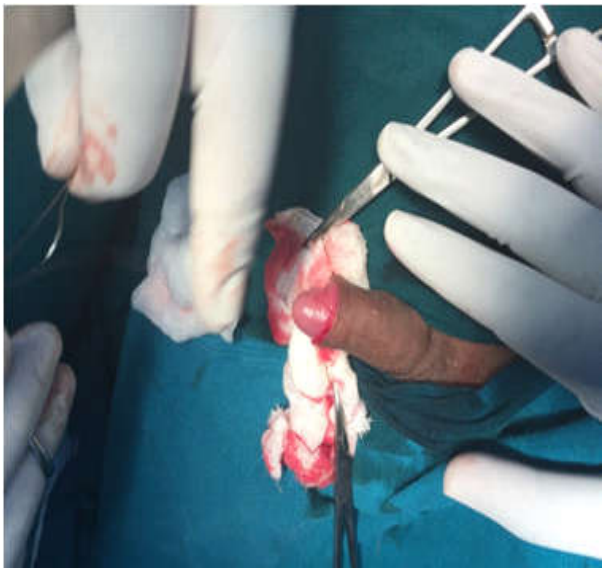
Unable to retract back prepuce was also a complaint in 12% patients of group A and in 3% patients of group B (p value 0.0160 i.e. statistically not significant). This was due to edema. Parents were encouraged for gentle retraction of prepuce over the glans after applying lignocane jelly locally. In the study conducted by Peter et. al, unable to retract back was slightly greater for patients with preputioplasty.

Phimosis by Preputioplasty and Circumcision





Sutured transversely



6-8 suture taken

Minimal bleeding from surgical site occurred in 12% cases of group B, no case reported in group A (p value 0.0001 i.e. statistically significant). Bleeding was managed by tight dressing and no one required re-operation. In the study conducted by Peter et. al, bleeding requiring re-operation was seen in 6% patients, operated by circumcision.

Fifteen days after the surgery, complaint of difficulty in micturition subsided in group A. Crying while micturition/Pain was still present in 6%cases, operated by circumcision and analgesics were continued for these patients.

It was seen that most of the group A patients (100%) were discharged after 24 hours of the procedure while only (20%) patients of group B were discharged on first post-operative day while rest (80%) patients were discharged on 2nd postoperative day. This suggests a faster recovery after preputioplasty than circumcision.

Repeated retraction of remaining preputial skin at home is necessary for a better outcome in preputioplasty.

Conclusion

Preputioplasty is a faster, easier, relatively painless surgery and has lesser complications than circumcision, except postoperative edema.

Post-operative hospital stay was longer in cases treated with circumcision.

Preputioplasty is easy to perform and fulfills the same purpose of a circumcision like, allows full mobilization of the foreskin, preserving its function and providing an excellent cosmetic result.

It also avoids the loss of the foreskin, which can be used for reconstructive procedures. Therefore, we conclude that preputioplasty is a better alternative to circumcision.

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