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Original Research Article

Plastibell circumcision in neonates and infants at tertiary care centre

Nandkishor D. Shinde*, Mohammad Moinuddin, A. N. M. Owais Danish

Department of Surgery, Khaja Banda Nawaz Institute of Medical Sciences, Kalaburagi, Karnataka, India

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***Correspondence:**
Dr. Nandkishor D. Shinde,
E-mail: drnandkishorshinde@gmail.com

ABSTRACT

Background: Circumcision is the most common surgical procedure in children worldwide. The aim of this study was to study the safety and complication of Plastibell circumcision in neonates and infants.
Methods: This prospective study of 420 male children less than 1 years who underwent Plastibell circumcision for religious or cultural indication in the Department of Surgery at KBN Institute of Medical Sciences, Kalaburagi, during February 2016 to January 2018. Children were divided into two groups; neonates (0 to 4 weeks) and infants (5 weeks to1 year). Parents were given specific instructions on care of the device on discharge and followed up on day 3 and on day of separation of the Plastibell.
Results: During the study period, 420 cases of Plastibell circumcision fulfilling the inclusion criteria were included and analyzed. Out of the total cases, 120 (28.57%) were neonates, whereas the remaining 300 (71.42%) were infants. Mean surgical time was 4±2 minutes. The mean number of days for Plastibell to separate was 6.2 days, Plastibell ring separation in neonates earlier (3 days to 7 days) as compared to infants (5 days to 12 days). Out of the total 420 cases 65 (15.47%) cases developed minor complications. In neonates, out of 120 cases only 05 (4.16%) developed complications. In infants, out of 300 cases, 60 (20%) developed complications.
Conclusions: Neonates had shorter time for the Plastibell to separate and with fewer complications than infants. Though complications were present, they were few and could be managed easily. Plastibell circumcision is safe in neonates and infants.

Keywords: Circumcision, Infant, Male, Neonate, Plastibell

INTRODUCTION

Circumcision is the most common surgical procedure in children worldwide. The practice of circumcision is thought to be at least 15,000 years old.[1]

In male circumcision we remove the redundant foreskin of glans. Circumcision is a common and ritual practice among Muslims and Jews. The benefits of circumcision have been recognized in various studies. There is a lower risk of penile cancer and cancer of the cervix uteri in female sex partners.[2-5] The procedure is most often an elective surgery performed on babies and children for religious or cultural reasons.[6,7] In other cases it may be done as a treatment for certain medical conditions or for preventive reasons. Medically it is a treatment option for problematic cases of phimosis, balanoposthitis that does not resolve with other treatments, and chronic urinary tract infections (UTIs). It is contraindicated in cases of certain genital structure abnormalities or poor general health such as a misplaced urethral opening (as in hypospadias and epispadias), curvature of the head of the penis (chordee), or ambiguous genitalia, because the foreskin may be needed for reconstructive surgery. Circumcision is contraindicated in premature infants and those who are not clinically stable and in good health.[7,8]

Neonatal circumcision is usually elected by the parents for non-medical reasons, such as religious beliefs or personal preferences, possibly driven by societal norms.[8]

Various techniques are available for circumcision, namely Plastibell, Gomco clamp, Mogen clamp, bone cutter method and dorsal slit (open cut) method.[9] Out of these, Plastibell method has become quite popular and appears to be the more preferable procedure particularly in the age group ranging from neonates to one year of age. It is because of being a quick, easy, least traumatic technique with minimal blood loss and having least number of complications. It also provides very good cosmetic results.[9,10] The use of local anaesthesia for the procedure is recommended for neonates and for older children.[11]

Plastibell' is a single-use disposable plastic device mainly used to circumcise infants, but it can be used for boys up to 12 years of age. The Plastibell plastic ring is placed under the foreskin and secured with a circumferential ligature, which prevents bleeding when the distal foreskin is excised. The entire procedure takes five to ten minutes.[12]

This study was thus undertaken to document experience with the use of Plastibell device for circumcision in neonates and infants in Department of Surgery at Khaja Banda Nawaz Institute of Medical Sciences, Kalaburagi, Karnataka, India.

METHODS

This prospective study of 420 male children less than 1 years who underwent Plastibell circumcision for religious or cultural indication in the Department of Surgery at Khaja Banda Nawaz Institute of Medical Sciences, Kalaburagi, during February 2016 to January 2018. Children were divided into two groups: neonates (0 to 4 weeks) and infants (5 weeks to 1 year). Children who had medical indication of circumcision, congenital abnormalities like hypospadias, de-ranged coagulation profile and any other medical illnesses were excluded.

Parents were advised to stop feeding the neonates or infants for 2 hours prior to surgery. Consent was taken from parents describing all the benefits and adverse effects that might occur after the procedure. Parents were given specific instructions on care of the device on discharge and followed up on 3rd day and on day of separation of the Plastibell.

Method of Plastibell circumcision

Under aseptic condition local anaesthesia in the form of ring block with 0.5% lignocaine in a dose of 1 mg/kg was applied to the base of the penis.

The Plastibell is a clear plastic ring with handle and has a deep groove running circumferentially (Figure 1, 2).

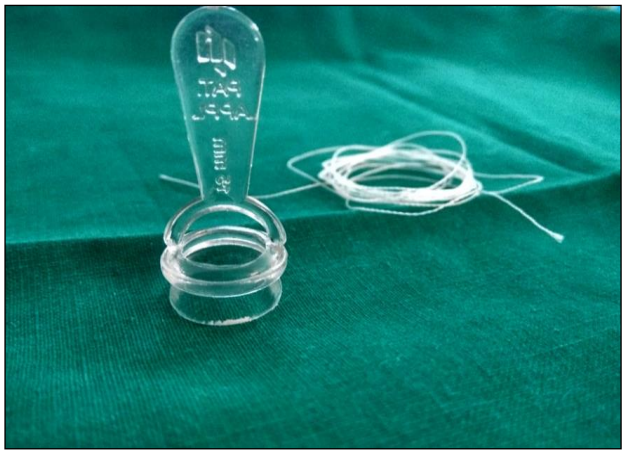

Figure 1: Plastibell device.

Figure 2: Plastibell ring deep groove running circumferentially.

Figure 3: Post procedure image of Plastibell circumcision.

The adhesions between glans and foreskin were divided with an artery forceps. Then the foreskin was cut longitudinally starting at the distal end dorsally to allow it to be retracted so that the glans was exposed. The Plastibell comes in 6 sizes. Sizes between 1.2 and 1.7cm were utilized. An appropriate size of Plastibell which

snugly fits in 2/3 of the glans was then placed on the glans and the foreskin brought over it. A linen thread ligature was tied firmly around the foreskin, crushing the skin against the groove in the Plastibell. Then the excess skin protruding beyond the ring is trimmed off and the handle of the ring was broken off at the end of the procedure. The compression against the underlying plastic shield causes the foreskin tissue to necrose (Figure 3).

The ring falls off in 3 to 7 days leaving a circumferential wound that will heal over the following week. Plastibell circumcision was done as outpatient procedure in all children.

Oral analgesic and local antibiotic ointment was given to all children. Parents were given specific instructions on care of the device on discharge. All neonates and infants were called for follow-up on 3rd day and on day of separation of the Plastibell and were told to contact earlier, in case of any complication. The patients in which the ring was not separated within 2 weeks were called for follow-up and the ring was removed by cutting the thread and excision of the necrotic foreskin with or without local anaesthesia. A ring cutter was used to remove the ring (if required).

Statistical analysis was performed using SPSS, version 18.0 software.

RESULTS

During the study period, 420 cases of Plastibell circumcision fulfilling the inclusion criteria were included and analyzed.

Out of the total cases, 120 (28.57%) were neonates, whereas the remaining 300 (71.42%) were infants. Mean age of the neonates was 20±2 days whereas that of infants was 4.0±0.5 months. The mean weight was 4.7kg (2.2kg to 6.8kg). The model Plastibell size was 1.3 cm in both groups. The mean surgical time was 4±2 mins. The mean number of days for Plastibell to separate was 6.2 days with a range from 3 days to 12 days for all children; Plastibell ring separation in neonates earlier (3 days to 7 days) as compared to infants (5 days to 12 days).

Out of the total 420 cases, the successful rate of Plastibell circumcision without any complication was recorded in 355 (84.53%) cases. The remaining 65 (15.47%) cases developed minor complications. In neonates, out of 120 cases only 05 (4.16%) developed complications. In infants, out of 300 cases, 60 (20%) developed complications. The most common complication in both group was delayed separation of the ring recorded in 28 cases, (02 neonate and 26 infants), other complications included bleeding in 14 cases (1 neonate and 13 infants), localized superficial infection in 12 cases (1 neonate and 11 infants), proximal migration of ring in 8 children(1 neonate and 7 infants) and inadequate skin removal occurred in 03 infants.

Table 1: Various complications in neonates and infants.

Complications	Neonates (n =120)	Infants (n=300)	Total (n=420)
Delayed separation of ring	02 (1.67%)	26 (8.66%)	28 (6.66%)
Bleeding	01 (0.83%)	13 (4.33%)	14 (3.33%)
Localised superficial infection	01 (0.83%)	11 (3.67%)	12 (2.8%)
Proximal migration of ring	01 (0.83%)	07 (2.33%)	08 (1.90%)
Inadequate skin removal	00	03 (1%)	03 (0.71%)

Complications of delayed separation of the ring, bleeding, localized superficial infection and proximal migration of ring was found most commonly in infants than in neonates (Table 1).

DISCUSSION

In the present study mean number of days for Plastibell to separate was 6.2 days with a range from 3 days to 12 days for all children, Plastibell ring separation in neonates earlier (3 days to 7 days) as compared to infants (5 days to 12 days). Other studies had documented that the residual plastic ring usually falls off within 10 days of the procedure, while the ring separates faster in neonates due to thin prepuce and easier sloughing.[13-15]. The mean surgical time in our study was 4±2 mins which is comparable with other studies.[12,14]

The technique of Plastibell circumcision had established itself as an acceptable form of circumcision particularly in neonates to one-year old infants. Complications with this technique were reported to be 2% to 3%.[14,16-18] In the present study 15.47% children were developed minor complications. In neonates, 4.16% and in infants 20% were developed complications.

In the present study complications were minor but most common complication was delayed separation of the ring while in other studies most common complications were bleeding and local infection.[9,14,16,17]

Study by Mak YLM et al had 1.3% cases of redundant mucosa in Plastibell group that may be due to the inappropriately sized bell.[19] The choice of a correctly sized bell is important. If the bell is too small, it causes compression of the glands and oedema, thus leading to micturation difficulty. If the bell is too large, proximal dislocation or distal dislocations can occur.[19] In the present study 0.71% children had redundant mucosa.

Other minor complications include bell impaction, dysuria, incomplete separation of Plastibell device, proximal migration of the ring, and excessive loss of skin.[20] However, case reports of significant complications have also been documented that includes necrotizing fasciitis, urinary retention and ischemic necrosis of the glans.[17] But in the present study no major complication occurred.

The lower frequency of complications among neonates and infants is likely to be attributable to the simpler nature of the procedure in this age group, and the healing capability in the new-born. Further, a major advantage of neonatal circumcision is that suturing is not usually necessary, whereas it is commonly needed for circumcisions in the post-neonatal period. This advantage is illustrated by the US study in which no complications were seen among 98 boys circumcised in the first month of life, but 30% of boys aged 3-8.5 months had significant postoperative bleeding.[21]

CONCLUSION

Neonates had shorter time for the Plastibell to separate and with fewer complications than infants. Though complications were present, they were few and could be managed easily. The modal size of 1.3cm was the right size for both neonates and infants. Plastibell circumcision is safe in neonates and infants.

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