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Dr. Meera Luthra

Senior Consultant, Paediatric
Surgery, Holy Family
Hospital, New Delhi, India

Dr. Himanshu Gupta

Resident, Department of
Surgery, Holy Family
Hospital, New Delhi, India

Plastibell circumcision in neonates: A review of procedure and analysis of complications

Dr. Meera Luthra and Dr. Himanshu Gupta

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Abstract

Introduction: Male circumcision involves surgical removal of prepuce that covers the glans penis. Plastibell, Gomco clamp, Mogen's clamp are most commonly used devices in neonatal circumcision.

Aims: The aim of this retrospective study was to evaluate circumcision done by Plastibell device in neonates. We reviewed the outcomes including the appearance, ease and safety of use and the complications of this procedure. The nuances of this simple procedure are described and the need for skilled surgeons to perform it to make it free of the serious complications has been emphasized.

Methodology: This retrospective study included 108 physiologically stable neonates with low to normal birth weight who underwent Plastibell circumcision by a single surgeon at hospitals across National Capital Region, India. Neonates with congenital abnormalities like hypospadias, sick, very low birth weight were not taken for operation.

Results: Complications occurred in above mentioned cases were- redundant skin [02/108], ring slippage with bleeding [01/108], early ring fell off [02/108], infection [0/108], fringe of skin left [01/108]. All [06/108] complications could be managed satisfactorily.

Discussion: Plastibell circumcision is a safe procedure and can be done under local anaesthesia. It has got superior cosmetic results and parental acceptance is very high. It requires an experienced surgeon to do the procedure with best results. To avoid rare life threatening or serious complications this is not the preferred method in older children as there is limitation of available sizes, higher chances of slippage and requirement of sedation even if the size is suitable.

Keywords: Plastibell, circumcision, local anaesthesia, neonate

Introduction

Male circumcision involves surgical removal of prepuce that covers the glans penis. It is probably the most common surgical procedure in children worldwide. The practice of circumcision is thought to be at least 15,000 years old ^[1]. A variety of clamp methods were developed including the Gomco clamp in the 1930's, Mogen clamp in 1954 and the Plastibell in the 1960's. They are the most commonly used devices in newborn circumcisions. In a report by the committee on the fetus and newborn of the American Academy of Pediatrics, no absolute indication for routine circumcision of the newborn was advocated ^[2]. Majority of the cases in our study belonged to Islamic population and were done for religious and cultural reasons.

Plastibell, originally registered trademark to Hollister Inc. [Hollister and logo, Plastibell and the stylized bird design are trademarks of Hollister Incorporated, Libertyville, Illinois 60048 USA.] initially had some issues regarding the patent because the technique used i.e. strangulation with a tied cord resembling Ross ring dating from 1939. The original design patent expired in 1970s, and it is now free for all to copy the design. The World Health Organization (WHO)'s manual on male circumcision listed the Plastibell technique as a well proven method with respect to its results and complications. Plastibell device is a plastic ring with handle and has a deep groove running circumferentially. The ring, which comes in different sizes, currently available are 1.1, 1.2, 1.3, 1.4, 1.5, 1.7. Most common size used by us in newborns was 1.3.

The aim of this study paper is to review the major complications described in previous literatures and to evaluate our cases of neonatal circumcision using Plastibell device with regards to the performance of procedure by a senior surgeon and the complications that occurred.

Corresponding Author:

Dr. Meera Luthra

Senior Consultant, Paediatric
Surgery, Holy Family
Hospital, New Delhi, India

Method

Study population: This retrospective study included 108 neonates who underwent Plastibell circumcision by a single surgeon at hospitals across National Capital Region, India

Inclusion criteria: Physiologically stable neonates with low to normal birth weight.

Exclusion criteria: Neonates with congenital abnormalities like hypospadias, sick, very low birth weight were not taken for operation.

Methodology: General physical examination, preoperative genital examination, haemoglobin level, viral markers, consent-taking and full explanation to the parents was done. No preoperative antibiotics were given.

The surgical procedure was performed as follows:

1. The baby is identified and restrained by holding the baby. The penis is cleaned with betadine solution

- [Fig.1].
2. Local anesthesia provided by 1 to 1.5 ml of 1% Xylocaine as penile block [Fig.2]. A pacifier is given to the baby to suck during the procedure.
 3. The preputial ring is dilated using three hemostats and the urethral meatus identified. The foreskin is grasped with hemostats at 10, 2, 6 o'clock positions [Fig. 3].
 4. Preputial adhesiolysis is done to free the entire glans and completely retracted to expose the glans. Sometimes, a partial dorsal slit is made after crushing the skin for few seconds.
 5. The correct size Plastibell is selected by due experience of the senior surgeon or by testing it directly on the glans. The ring is covered with the free skin [Fig. 4].
 6. A cotton ligature is tied firmly around the groove using a surgeon's knot crushing the skin against the groove. Handle of the Plastibell is broken [Fig.5].
 7. Excessive protruding skin is trimmed off taking care not to damage the glans [Fig. 6].



Fig 1: Preoperative normal penis



Fig 2: Local anesthesia with penile block

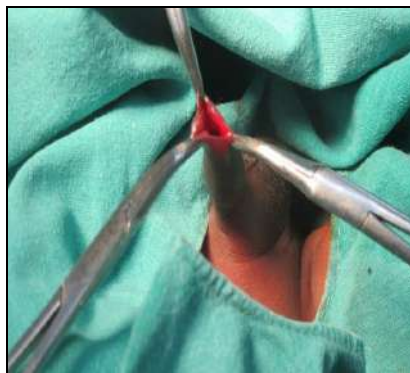


Fig 3: Preputial adhesiolysis



Fig 4: Plastibell application



Fig 5: Breaking the plastibell handle

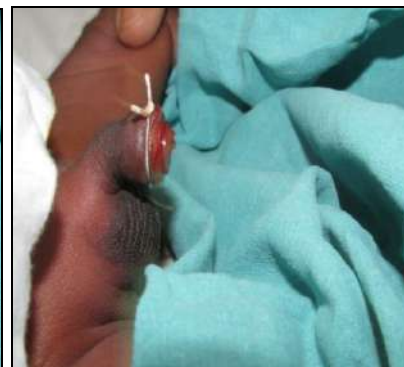


Fig 6: Post-operative image with ring in place

Post-operatively, Vaseline gauze is applied to the site. Oral paracetamol was given for analgesia, no antibiotics were prescribed.

Neonates were monitored post procedure for any evidence of complications. The procedure was done in operation theatre for out born babies and admitted patients were discharged the same day and followed up after 7 days. The ring had fall off in 1 to 7 days. The parents were educated about the care of site and were advised to watch for any complications and encouraged to visit to the hospital in case of any problem and they were given emergency contact numbers for any queries. All the complications during hospital stay and after discharge were collected.

Results

The neonates included in this study were of age ranging from 18 hours to 01 month [average age 14 days]. Weight of babies ranged from 2.3 kg to 6 kg [average weight 3.2 kg]. Average size of plastibell used was 1.3. Plastibell ring fell off in 01 to 07 days [average 04 days]. The complications that occurred in above mentioned cases were- redundant skin [02/108], ring slippage with bleeding [01/108], early ring fell off [02/108], infection [0/108], fringe of skin left [01/108] [Table 1].

Table 1: Complications following plastibell circumcision

Complication	Rate	Percentage
Redundant skin	01/108	0.92 %
Ring slippage with bleeding	01/108	0.92 %
Early ring fell off	02/108	1.85 %
Infection	0/108	0.00 %
Fringe of skin left	01/108	0.92 %
Total	05/108	4.63 %

Discussion

Complications following circumcision can be divided into early or late ones. Early complications include minor ones like pain, bleeding, inadequate skin removal, and infection and serious early complications include iatrogenic hypospadias, Glanular necrosis or amputation. Late complications are epidermal inclusion cysts, suture sinus tracts, Chordee, penile adhesions, Phimosis, buried penis, Urethrocuteaneous fistulae, Meatitis, and Meatal stenosis [3]. Necrotizing fasciitis is a rare but potentially life-threatening complication [4].

Four basic principles of circumcision are asepsis, adequate excision of outer and inner preputial layers, hemostasis, and better cosmetic results [5]. In our study we concluded that circumcision with Plastibell device if done under all aseptic precautions, minimizes risk of infection, also post operatively no permanent dressing is applied so monitoring for infection is easy. Although no circumcision is painless as it involves foreskin with highly sensitive nerve endings, local anaesthetic and post-operative oral paracetamol effectively reduce the pain. Since the glans is protected by the ring, its trauma is unlikely. Haemostasis is achieved with careful application of ligature. Plastibell ring prevents skin bridges between edges of prepuce allowing better healing and little or no scar giving good cosmetic results.

The procedure of circumcision by Plastibell device is safe, can be done under local anaesthesia. It has got superior cosmetic results and parental acceptance is very high. In our study none of the complications were severe enough that could not be managed, although it requires experienced

surgeon to do the procedure with best results. It is preferred in younger children as they do not require sedation and also chances of slippage are low.

Limitations of this study include that the results are from a single experienced senior surgeon. The results, therefore, cannot be generalized. We did not compare the results with other methods of circumcision.

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