



Comparison of Plastibell Circumcision with Conventional Circumcision in Infants at Tertiary Care Centre

Mohammed Moinuddin¹, Nandkishor Shinde^{1*}, Ravindra Devani¹
and Ashfaq Ahmad¹

¹Pediatric Surgery Unit, Department of Surgery, Khaja Banda Nawaz Institute of Medical Sciences, Kalaburagi-585104, Karnataka, India.

Authors' contributions

This work was carried out in collaboration between all authors. All authors read and approved the final manuscript.

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ABSTRACT

Objective: Evaluate two methods in terms of the incidence of complications in infants.

Materials and Methods: The present study was conducted on 560 infants who were brought for religious or ritual circumcision to the Pediatric Surgery unit. Infants were randomly divided into two groups, Plastibell group and conventional group based on the type of intervention. Randomization was done in all cases unless the parents insisted on a particular method for circumcision. Plastibell circumcision and conventional circumcision were done as an outpatient procedure in all the cases. Follow up was done on 3rd day, 15th day and on day of separation of the plastibell in plastibell group and were told to contact earlier, in case of any complication.

Results: During the study period, a total of 560 children with age less than 12 months fulfilling the inclusion criteria were analyzed. Out of 560 cases, 310 cases were of Plastibell circumcision group and 250 cases were of conventional circumcision group. The mean number of days for plastibell to separate was 6.2 days (3-12 days); Cosmetic results were similar in both the methods. Out of the total 560 cases, the successful rate of circumcision without any complication, were recorded in 475

*Corresponding author: E-mail: dmandkishorshinde@gmail.com;

(84.82%) cases. A total of 65 cases out of 310 in Plastibell group and 20 cases out of 250 in conventional group developed complications. Complications like bleeding, localized superficial infection occurred most commonly in Plastibell circumcision group. It was concluded that the Plastibell device is a satisfactory method for circumcising children of this age group.

Keywords: Plastibell; conventional; circumcision; infants.

1. INTRODUCTION

Circumcision is a common surgical operation in pediatric surgical practice [1,2]. It is one of the most ancient surgical procedures and has remained controversial in several aspects [3,4].

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 [5-8].

Attitudes toward routine circumcision have varied over the years. The lack of consensus with regard to the actual function of the prepuce, coupled with debates on the benefits of circumcision, have been controversial among the religious and cultural groups [9].

The procedure is most often an elective surgery performed on babies and children for religious or cultural reasons [10,11]. 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, balanoposth it is 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 [11,12].

There are several methods of performing circumcision. There are free-hand surgical methods and a method involving the use of appliances namely Plastibell, Gomco clamp, Mogen clamp, and bone cutter method [13]. 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 [13,14]. The use of local anaesthesia for the procedure is recommended for neonates and for older children [15].

This study was thus undertaken to compare plastibell circumcision with conventional circumcision in children less than 1 years at tertiary care centre.

2. MATERIALS AND METHODS

The present study was conducted from February 2016 to January 2018 on 560 children with age less than 12 months who were brought for religious or ritual circumcision to the Pediatric Surgery unit. Children with congenital anomalies like hypospadias, deranged coagulation profile, any associated systemic illness or any other indication for surgery were excluded.

Infants were randomly divided into two groups, the Plastibell group and conventional group based on the type of intervention. Randomization was done in all cases unless the parents insisted on a particular method for circumcision we have excluded the boys where the parents had made the decision on the method of operations.

Informed written consent was taken from the parents of the infants who were eligible based on inclusion criteria. Parents were advised to stop feeding 2 hours prior to the surgery.

The skin was prepared with povidine iodine (10%) solution and parts were draped.

Sedation with local anaesthesia in the form of ring block with 0.5% lignocaine in a dose of 1 mg/kg was given at the base of penis.

2.1 Method of Conventional Circumcision

The prepuce was retracted over the glans penis, this enables the smegma to be cleaned and any adhesions to be separated. The prepuce was freed right to the corona and a circumferential knife incision was made around the shaft on the inner preputial skin leaving a sleeve of 0.5 cm proximal to the corona. The prepuce was returned to cover the glans and another circumferential incision was made around the shaft at the same position as the first one. A longitudinal cut was made between the two circumferential ones and preputial skin was resected leaving a 0.5 cm sleeve proximal to the corona. Hemostasis was secured by ligating the bleeding vessels, starting with the frenular artery. The proximal penile skin was then sutured to the coronal preputial sleeve using 4-0 absorbable suture. Mild compression dressing was done to prevent bleeding in the conventional dissection group.

2.2 Method of Plastibell Circumcision

The Plastibell is a clear plastic ring with handle and has a deep groove running circumferentially (Fig. 1). The adhesions between glans and foreskin were released by 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. Usually Plastibell comes in 6 sizes. In our study, size ranging between 1.2 and 1.7 cm 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 was 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 was trimmed, 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 undergo necrosis (Fig. 2a-d).

The ring usually falls off in 3 to 7 days leaving a circumferential wound that heals over the next week.

Plastibell circumcision and conventional circumcision were done as an outpatient procedure in all the cases.

Oral analgesic and local antibiotic ointment was applied in all cases. On discharge, Parents were given specific instructions about the care of the device.



Fig. 1. Showing Plastibell device



Fig. 2a. Showing Plastibell snugly fits on glans



Fig. 2b. Linen thread ligature tied around the foreskin over groove in the Plastibell



Fig. 2c. Showing excess skin protruding beyond the ring was trimmed off



Fig. 2d. Showing post procedure image of plastibell circumcision

Follow up was done on 3rd day, 15th day and on day of separation of the plastibell in plastibell group 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 was done with or without local anaesthesia. A ring cutter was used to remove the ring (if required).

3. RESULTS

During the study period, a total of 560 children with age less than 12 months fulfilling the inclusion criteria were analyzed. Out of 560 cases, 310 cases were of Plastibell circumcision

group and 250 cases were of conventional circumcision group. Mean age in Plastibell circumcision group was 4.0 ± 3.5 months whereas in conventional circumcision group was 3.50 ± 2.8 months. The mean surgical time for Plastibell circumcision group was 4 ± 2 minutes whereas that of conventional circumcision group was 10.0 ± 3.5 minutes. The time taken for surgery was less in plastibell technique as compared to conventional technique. The mean number of days for plastibell to separate was 6.2 days (3-12 days); pain after 3rd day of circumcision was more in plastibell circumcision group than in conventional circumcision group (160 cases in plastibell group vs 10 in conventional group). Cosmetic results were similar in both the methods.

Out of the total 560 cases, the successful rate of circumcision without any complication, were recorded in 475 (84.82%) cases. The remaining 85 (15.17%) cases developed minor complications. A total of 65 (20.96%) cases out of 310 in Plastibell circumcision group and 20 (8%) cases out of 250 in conventional circumcision group developed complications (Table 1). The most common complication in both groups was bleeding. Complications like bleeding, localized superficial infection occurred most commonly in Plastibell circumcision group than in conventional circumcision group (Table 1).

4. DISCUSSION

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 [16].

In our 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. Other studies had documented that the residual plastic ring usually falls off within 10 days of the procedure [17,18]. While the ring separates faster in neonates due to thin prepuce and easier sloughing [18,19].

Time for surgery is less in plastibell circumcision as compared to conventional circumcision. The mean surgical time for plastibell circumcision in our study was 4 ± 2 mins which is comparable with other studies [16-19].

Table 1. Various complications in Plastibell circumcision and Conventional circumcision

Complications	Plastibell group (n=310)	Conventional group (n=250)	Total (n=560)
Bleeding	25(8.06%)	10(4%)	35(6.25%)
Localised superficial infection	16(5.16%)	08(3.2%)	24(4.28%)
Inadequate skin removal	04(1.29%)	02(0.8%)	06(1.07%)
Delayed separation of ring	11(3.54%)	-	11(1.96%)
Proximal migration of ring	09(2.90%)	-	09(1.60%)
Total no of complications	65(20.96%)	20(8%)	85(15.17%)

The overall complication rate of the procedure ranges between 0.19% and 3.1% [20]. However, in a few studies, it was as high as 17.6% [21]. In our study overall complication rate was 15.17%.

In our study most common complications were bleeding and localised infection in both groups, in other studies also most common complications were bleeding and local infection [13,18,22,23].

Many studies proposed that circumcision with plastibell technique is a simple method and complications include bell impaction, dysuria, incomplete separation of Plastibell device, proximal migration of the ring, and excessive loss of skin are minor [16-19]. However, case reports of significant complications have also been documented that includes necrotizing fasciitis, urinary retention and ischemic necrosis of the glans [23]. On the other hand, tragic complications such as traumatic amputation of the glands and urethra-cutaneous fistula in open technique have been reported in other studies [24-27]. But in our study no major complication occurred in both groups.

Study by Mak Y L M et al. [21] had 1.3% cases of redundant mucosa in Plastibell group that may be due to the inappropriately sized bell. 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 [21]. In our study 1.07% children had redundant mucosa.

Mak et al. reported that the overall complication rates (intra- and postoperative) were similar between the conventional dissection and Plastibell groups being 17.6% and 17.8%, respectively [21]. In our study overall complications of conventional circumcision group

were 8% however Plastibell group had 20.96% complications, however complications in both groups were minor and easily manageable.

In a randomized trial study, Fraser et al. [28] compared these two methods in childhood and concluded that the PD procedure is a satisfactory method for circumcising children.

5. CONCLUSION

Overall complication rate of Conventional circumcision was less than that of the Plastibell circumcision, however no serious complication were encountered with either method; Plastibell technique was performed quickly as compared to conventional open technique. Cosmetic results were similar for both methods. It is concluded that the Plastibell device is a satisfactory method for circumcising children of this age group.

CONSENT

Informed written consent was taken from the parents of the infants who were eligible based on inclusion criteria.

ETHICAL APPROVAL

As per international standard or university standard written ethical approval has been collected and preserved by the authors.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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