Plastibel Circumcision: Safest Technique in the Infants with the Experienced Hands: A Single Centre Experience

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ABSTRACT

Objective: To evaluate the safety and efficacy of circumcision done by plastibel technique in infants up till six months of age.
Study Design: Cross-sectional study.
Place and Duration of Study: Department of Surgery, Combined Military Hospital, Multan, from Aug 2019 to Jul 2020
Methodology: The Department of surgery, Combined Military Hospital, Multan, from 2019 to 2020. A sample size of 140 patients was calculated via the EpiTools epidemiological calculator while keeping the significance level at 5% and a confidence level of 95%.
Results: A total of 140 infants were circumcised with the plastibel technique. The age of the infants ranged from 21 days to six months with the mean age of 32.2 ± 10.5 days. Maximum circumcisions were done between 30-90 days of life. The best part of the circumcision was that no complication was observed during the study period.
Conclusion: Plastibel circumcision can be done under local anaesthesia with the best possible safety in infants younger than six months of age.

Keywords: Circumcision, Infants, Local anaesthesia, Plastibel technique.

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INTRODUCTION

Circumcision means the surgical removal of the prepuce, the most distal part of the foreskin, to expose the glans penis. The procedure of circumcision is almost 15000 years old.[1,2] It is the most common surgical procedure in male infants. In our setup, most circumcisions are carried out for religious and cultural reasons, although there are therapeutic indications for circumcision. There is no absolute indication for routine circumcision in neonates.[3] The medical indications are phimosis, paraphimosis and balanitis xerotica obliterans.[4] Male circumcision is reported to reduce the chances of developing sexually transmitted infections.[5] The circumcised boys have a lower incidence of urinary tract infections, paraphimosis, decreased zipper injuries and less chances of getting penile cancer in adult life.[6] The opponents of circumcision argue that circumcised males have decreased penile sensation and less satisfaction with sexual intercourse. It is contraindicated in patients with bleeding disorders, severe infections around the prepuce and in the presence of hypospadias when the preputial skin may be required for subsequent reconstruction in staged procedures.[7,8]

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Most circumcisions in infants are carried out either by using the Plastibel technique or by the open dissection method. The procedure of plastibel circumcision was first introduced in 1956, and after that, it gained widespread acceptance. There are some reports of severe complications with the use of plastic devices in literature.[9,10] The present study evaluated the plastibel procedure for circumcision in terms of safety and efficacy in infants under six months of age.

METHODOLOGY

This cross-sectional study was conducted at the Department of Surgery, Combined Military Hospital, Multan, from 2019 to 2020. A sample size of 140 patients was calculated via the EpiTools epidemiological calculator while keeping the significance level at 5% and a confidence level of 95%. We got took reference statistics from the latest study conducted at the University Hospital in Nigeria in 2020, in which Bone cutter circumcision was compared with the plastibel technique in a randomized controlled trial.[11]

Inclusion Criteria: All the infants of age ranging from 21 days to six months of age with the normal external genitalia were included in the study.

Exclusion Criteria: Infants with hypospadias, bleeding disorders, and the small size of the phallus and buried penis were excluded from the study.

A 140 infants were selected for the study. Examination of the external genitalia was done before the procedure. Data was collected for every patient on a proforma regarding the age of the infant, size of the plastibel, any complication associated with the procedure and satisfaction of the parents in terms of under or over circumcision after approval from the hospital ethical review committee with the consent of all members. The procedure of plastibel circumcision and postop care was fully explained to the parents verbally and on written postoperative instructions proforma, which was handed over to them before circumcision. All the queries of parents were answered regarding the procedure both before and after the operation.

The procedure was carried out in the main operation theatre by a consultant paediatric surgeon. The procedure was carried out on dedicated Paediatric surgical theatre days. Sterilized instruments for circumcision were arranged. The appropriate size of the Plastibel device was also obtained, and a full aseptic protocol was observed. The baby was then placed in the supine position, restrained by the nurse, and the penile area was cleaned with povidoneiodine solution. Local anaesthesia 1% Bupivacaine plain in the form of the penile block was administered under the care of a paediatric anaesthetist to every baby, followed by a wait for 3-5 minutes. The prepuce was held at 3, and 9 o'clock positions with two pairs of haemostats and the adhesions beneath the preputial skin were gently broken down with the third pair of haemostats. The prepuce was then retracted, smegma was removed, and the urethral opening was confirmed to be normally sited. The dorsum of the prepuce at 12 o'clock up to the corona was gently clamped in haemostats for 10 seconds and then slit with the scissors. The bleeding, if any, from the frenular vessels was controlled by using bipolar diathermy during the procedure. The correct size plastibel device was then inserted over the glans, and the preputial skin pulled over the device. The ligature is then tied over the preputial skin on the groove of the Plastibel device, and the excess skin is cut just distal to the edge of the device (Figure-1A & 1B).

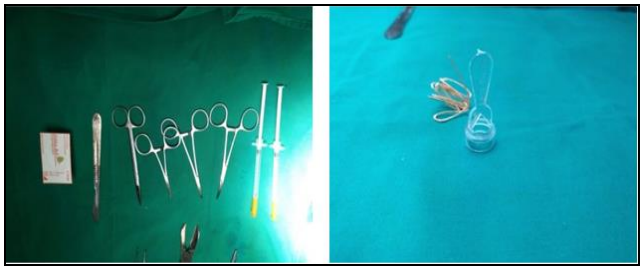

Figure-1A & 1B: Instruments used and plastibel device.

The site was then checked for any bleeding, and babies were returned to their mothers to be pacified by breastfeeding or bottle-feeding. The whole procedure lasts for 5-10 minutes (Figure-2A & 2B).

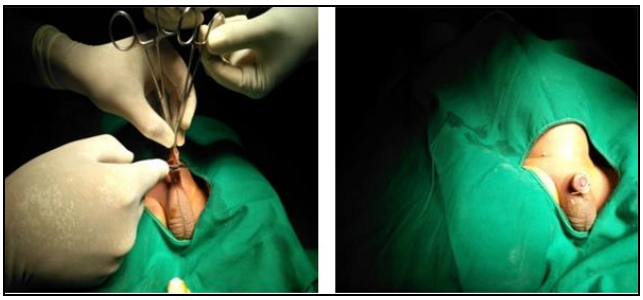

Figure-2A & 2B: Breaking preputial adhesions.

The infants were kept in the recovery room for 15 to 20 minutes after the procedure to look for any active bleeding from the operative site. Mothers were told that the device would fall off within 5-7 days after the procedure and strongly advised to return immediately in case of any problems, including bleeding, unusual swelling and inability to pass urine or retention of the Plastibel device beyond ten days of circumcision (Figure-3A & 3B).

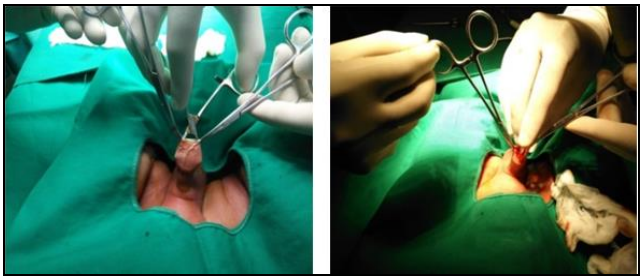

Figure-3A & 3B: Plastibel placement and final appearance.

Adequate analgesia in the form of Panadol drops or Calpol elixir and sitz bath were routinely prescribed. Parents were told to visit the clinic once the bell fell for reassurance regarding swelling of the penis, break any preputial adhesions with the glans, and see the results of circumcision.In case of under circumcision, mothers were instructed to retract the preputial skin with the lubricant daily for the next fourteen days.

SPSS version 21.0 was used for the data analysis. Quantitative variables were summarized as mean ± SD and qualitative variables were summarized as frequency and percentages.

RESULTS

A total of 140 infants were circumcised with the age ranging from 21 days to six months under local anaesthesia using 1% plain Bupivacaine as a penile

block. The mean age was 32.2 ± 10.5 days. The maximum number of patients were between 30 days to 90 days of age (Table). The time for the plastibel ring to fall was 6 to 10 days. All the circumcisions were done for religious and cultural reasons.

Table: Key parameters included in the study.

Size of Plastibel/ Number of cases/%	Number of Days for Plastibel to Fall	Nuber of Cases (%)	Age at Circumcision	Nuber of Cases (%)
1.1 (80) 57.14%	5	63 (45)	30 days	52 (37.14)
1.2 (60) 42.85%	6	47 (33.5)	45 days	30 (21.42)
1.3 (0)	7	25 (17.85)	60 days	39 (27.85)
1.4 (0)	10	5 (7.14%)	90 days	19 (13.5)

DISCUSSION

The plastibel is a simple device for circumcision in infants. It is a safe procedure in infants if done by a trained person. When the procedure is performed by the unskilled, it is associated with significant complications.

The procedure is done under local anaesthesia. Various modalities of anaesthesia are being used worldwide like EMLA (eutectic mixture of local anaesthesia), topical cream, pacifier use like sucrose and glucose, penile block, caudal epidural block, and anaesthetic gel application. Infants perceive pain like adults, and WHO recommends the use of anaesthesia for paediatric circumcision. After the third week of life, we performed the procedure in all cases after physiological jaundice has settled in the babies and the Liver is producing adequate coagulation factors. Infantile circumcision is done for therapeutic, prophylactic, social, cultural and religious reasons worldwide. In our study, all cases were done due to religious and cultural reasons.

The size of the plastibel device ranges from 1.1 to 1.7cm. There are many ways to select the appropriate size of the plastibel device for the individual infant. We have relied upon a visual impression of the size of the glans in selecting the appropriate size. This method gets better with experience.

Mehmood *et al,* 2016,[11] reported more bleeding and a longer duration of operation in infants who had the bone-cutter technique compared with the plastibel device. A study by Abdullah *et al,*[12] in which plastibel is compared with dorsal slit methods observed a lesser operative time and blood loss using the plastibel method, while Moinuddin *et al,*[13] comparing plastibel versus conventional circumcision cited decreased operating time of 4.1 ± 2.0 minutes for plastibel circumcision and further noticed that the plastibel separates in 6-10 days of its application, while the ring separates faster in neonates due to thin preputial skin. We also observed the same in our study.

Bawazir, in 2019,[14] noticed less bleeding with the plastibel device while Ik his emojie *et al,*[15] observed no difference in bleeding between those who had their plastibel ring removed within 24 hours and those whose plastibel ring fell off spontaneously after some days. We did not encounter bleeding. Post-operatively due to attention to details of the procedure.

Many studies suggested that plastibel circumcision is a simple method and minor complications include local sepsis, bleeding, bell impaction, dysuria, incomplete separation of plastibel device, proximal migration of the ring, and excessive or inadequate skin removal.[13,14,16] In our study, we did not encounter any of the complications mentioned earlier.

Salle *et al,* in 2015,[17] reported glans trauma as one of the complications of this technique in an African study. We are lucky to have avoided this complication.

A study by Mak *et al,*[18] had 1.3% cases of the redundant prepuce in plastibel devices that may be due to the inappropriately sized ring. The choice of a correctly sized plastibel is important. If the bell is too small, it causes compression of the glans and oedema, thus leading to urinary retention. This problem was avoided in our study due to the correct size of the plastibel.

Jimoh *et al,*[19] in a multicenter study of more than 2000 cases, have also reported death following circumcision due to excessive postoperative bleeding. The infants have significantly less blood volume, and if they present late with bleeding, t his can lead to irreversible shock and death. Hussain *et al,* in 2015,[20] found infection and bleeding as the most common complications in their study. In our study, we followed meticulous surgical techniques to overcome these complications.

The reason for the success of the procedure in our study was that it was done by the consultant paediatric surgeon on a dedicated paediatric surgical theatre day. Moreover, in suboptimal conditions, circumcision was not done hurriedly in minor operation theatre or

the outpatient department. Use of properly sterilized instruments, good theatre light, meticulous haemostasis with the use of bipolar diathermy, proper selection of plastibel size, securely tied ligatures over the groove on the device, attention to the details of the procedure, and proper counselling of the parents about the post-operative care of the infant are some of the salient features.

LIMITATIONS OF STUDY

In our study, we shared the experience of less than a year with small sample size. Further studies with a large cohort of patients can validate the procedure in infants.

CONCLUSION

The plastibel technique can do circumcision with excellent safety in infants younger than six months under local anaesthesia without any complications and with greater acceptability of the procedure by the parents, providing a skilled professional does the procedure under ideal conditions.

Conflict of Interest: None.

Authors' Contribution

HUR: Study design, data collection, discussion, writing, HI: Data analysis and interpretation, GA: Authentication of references, MAK: Proof reading of manuscript, AA: Critical and literature review, NA: Figures and tabulation of results.

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