Plastibell Versus Bone Cutting Techniques in Neonatal and Infantile Circumcision: A Retrospective Study and Review of Outcomes

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ABSTRACT

Introduction and Aim of Study: *For thousands of years the practice of male circumcision is done based on religious, traditional and medical indications, Bone cutting method is a popular procedure despite the possible related complications, Plastibell technique is an alternative technique with the use of a special device, in this study we compared both techniques and outcomes.* ***Methods:*** *A retrospective analysis of 350 infants who had circumcision were classified into two groups plastibell group (Group A) and Bone cutting group (Group B), a comparative analysis regarding operative duration, anathesia used and post-operative complications.* ***Results:*** *182 infants (93 less than 28 days and 89 were 28 days or older) in (Group A), and 168 (102 less than 28 days and 66 were 28 days or older) in (Group B), operative duration in (Group A) was 3-8 minutes (Mean 4.76, SD 1.20), 5 -12 minutes (Mean 6.83, SD 1.68) in (Group B). local anathesia cream only was used in 111 infants (61%) in (Group A) and 90 infants (53%) while addition of penile block was needed in 71 infants (39%) in (Group A) and 78 infants (47%) in (Group B) (P value < 0.01). post-operative complications penile edema in 53 (29.1%) and 34 (20.2%), bleeding in 3 (1.6%) and 15 (8.9%) in groups A and B respectively (P value <0.01). 2 infants in Group B had superficial injuries and 2 cases (1.6%) had retention of the plastibell which needed manual removal (NS).* ***Conclusion:*** *Plastibell technique for circumcision is a safe and easy procedure with less operative duration and post-operative complications when compared with conventional bone cutting technique.*

INTRODUCTION

Even though circumcision is one of the oldest and commonest surgical interventions, yet it is considered a debatable issue. [(1)] The start of such surgical procedure is dated back to ancient Egyptians and since that time it is considered a social and cultural act. Moreover, it has a religious aspect specially in Muslims and Jewish populations. [(2)]

In 2012 The American Academy of Pediatrics (AAP) reviewed the potential medical advantages of surgical circumcision including the decline of the urinary tract infection during childhood, sexually transmitted viral infections such as HIV and Human papilloma viruses, in addition to the observed reduction of penile and cervical cancers as well. [(3)]

There are various surgical techniques for circumcion such as dissection method, dorsal slit, bone cutting (guillotine methods), Gomco clamp and Mogen clamp. Plastibell method has gain a marked popularity in neonatal and infantile age groups being a rapid and easy technique with less rate of bleeding and complications combined with good outcomes. [(4)]

In many countries, the bone cutting technique is widely done, however, its complications may range from minimal to life endanger or loss of organ levels, commonly bleeding and infection represent the vast majority, however serious penile injuries including partial or complete penile amputations may occur. [(5)]

The Plastibell device is a development of previously used metallic instruments with the intend to apply an ischemic pressure necrosis of the penile foreskin and it has variable sizes starting from 1.1 to 1.7 cm in diameter with use of a special thread that it should be tight enough to cause the needed ischemic effect after its secure tightness over the penile skin. [(6)]

Despite the apparent advantages of such technique still some complications can result in either early onset such as haemorrhage, infection, dysuria, glans penis necrosis in case of small bell use, bell impaction or migration and impaction if larger size is used, and delayed bell separation in case of loose thread or late complications such as

in adequate or excessive penile foreskin excision.

In this study an evaluation of the plastibell method in comparison to the routinely done bone cutting technique regarding operative duration, intra and post-operative complications.

METHODS

A retrospective comparative study of 350 infants had circumcision using Plastibell technique (Group A) and Bone cutting technique (Group B) in the period of January 2016 to December 2016, each group of the patients was subdivided into two groups: (newborn infants 0 to 28 days) and (infants older than 28 days). All of them were indicated for circumcision on a routine religious or ritual cultural indications.

Preoperative assessment regarding fitness for the procedure with clearance from neonatologists and paediatricians with exclusion of preterm infants (less than 37 completed weeks gestational age) and infants had penile malformations, family history of bleeding disorders and blood diseases. Moreover, a medical clearance regarding the fitness for the procedure is routinely done. In our practice, we do not do preoperative laboratory investigations unless there is an indication.

Routinely we do circumcion with the aid of local Prilocaine and Lidocaine 5% cream application 30-45 minutes prior to procedure, with or without penile block Lidocaine 2% infiltration.

With a signed informed consent by the parents the operative steps for (Group A) Under complete aseptic conditions the procedure started by penile foreskin retraction and cleaning of smegmal secretions exposing penile coronal sulcus (Corona Glandis), skin marking the required level of circumcision taking care not to exceed or leave penile skin, using 3 clamps at 3, 6 and 9 O'clock a 12 O'clock dorsal slit half way between the skin edge and the marking line is made and according to the size of the penis application of the proper plastibell device (1.1-1.7 cm) is made, which is should fit 2/3 of the glans, [(6)] followed by special thread secure knot tying around the penile foreskin at the marked skin level over the plastibell devise, then using sharp curved scissors a circumferential foreskin excision leaving 1-2 mm of the penile foreskin distal to the knot to prevent slippage of the thread with assessment of haemostasis. (Fig.1) in this technique we usually do not apply gauze bandages.

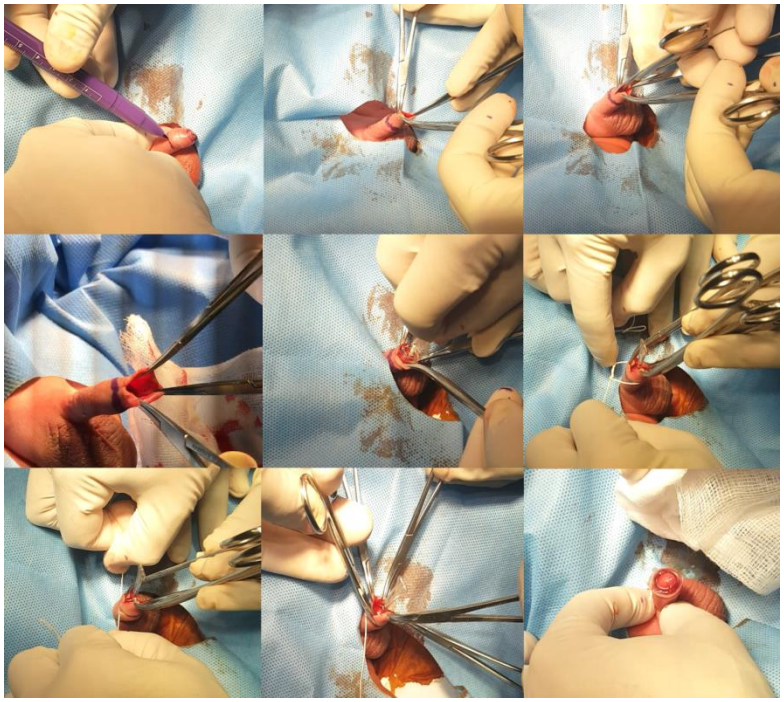

Fig. (1): Circumcision Using Plastibell technique

(Group B) steps after skin marking and cleaning of penile coronal sulcus application of two mosquito's clamps at 3 and 9 O'clock followed by application of Bone cutter instrument at the marked skin level with compression for 30-45 seconds taking care to ensure glans penis mobility to avoid its involvement, using No. 24 surgical blade excision of the penile foreskin, observation of the glans penis for any possible injuries and haemostasis by application of pressure gauze with or without absorbable 4/0 sutures in case of uncontrolled bleeding, followed by application of pressure bandage gauze for 1 day around the circumcision wound.

In both groups patients were observed for 1-2 hours post-operative under observation for bleeding, discharge medications in form of topical B·sitosterol 0.25% cream for one week, detailed discharge and follow up instructions are routinely given to the parents with explanation of alarming signs of post-operative complications.

In this study, we retrospectively compared both groups regarding patients ages, operative time and post-operative complications with statistical analysis using IBM SPSS STATISTICS 20 software which demonstrates qualitative variables into Percentages. Using Pearson correlation calculation, P-value <0.01 was taken as significant.

RESULTS

350 infants were included in this retrospective were indicated for circumcision procedure 182 (93 were newborn less than 28 days and 89 were 28 days or older) infants were done using plastibell technique (Group A), and 168 (102 were newborn less than 28 days and 66 were 28 days or older) infants had bone cutting technique (Group B) (Fig. 2)

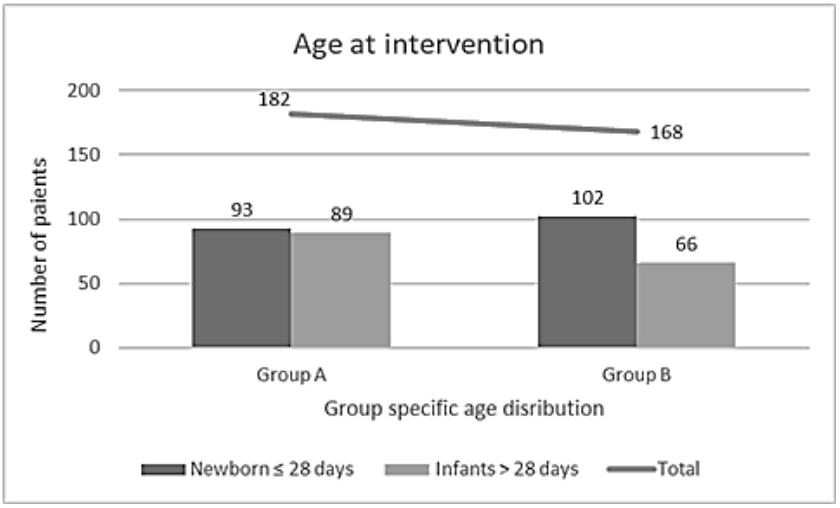

Fig. (2): A clustered column chart showing age and number of patients in each group

Regarding the operative duration in (Group A) range from 3-8 minutes (Mean 4.76, SD 1.20), While in (Group B) duration range from 5 -12 minutes (Mean 6.83, SD 1.68), on assessment of (Group A) 97 patients (53.3%) were operated in less than 5 minutes, 85 (46.7%) were operated from 5-10 minutes, While in (Group B) 158 patients (94%) were operated from 5-10 minutes, and 10 (6 %) needed more than 10 minutes to complete the procedure. (Fig.3)

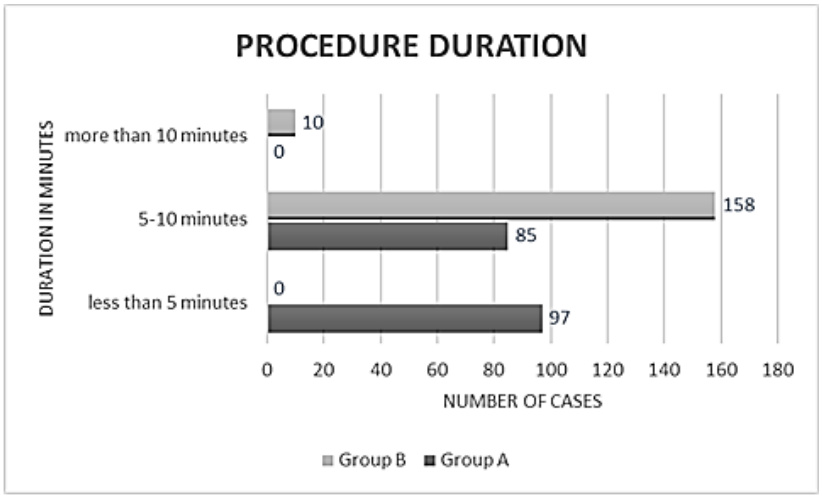

Fig. (3): A clustered bar chart showing operative duration subdivision for each group

Regarding the needed mode of anathesia prior to the procedure topical local anathesia cream only was used in 111 infants (61%) in (Group A) and 90 infants (53%) while addition of penile block was needed in 71 infants (39%) in (Group A) and 78 infants (47%) in (Group B) (Fig. 4) which has shown statistically significant on comparison between the two groups and in correlation with the operative duration and age of the infants (P value < 0.01).

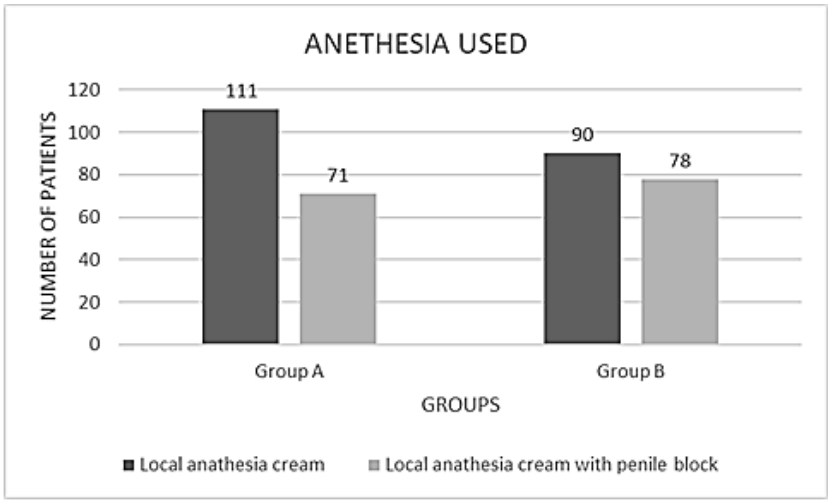

Fig. (4): A clustered column chart showing type of anathesia in both groups

On assessment of plastibell separation in Group A, we found it ranges from 5 to 11 days (average 7.2 / SD 1) (Fig. 5)

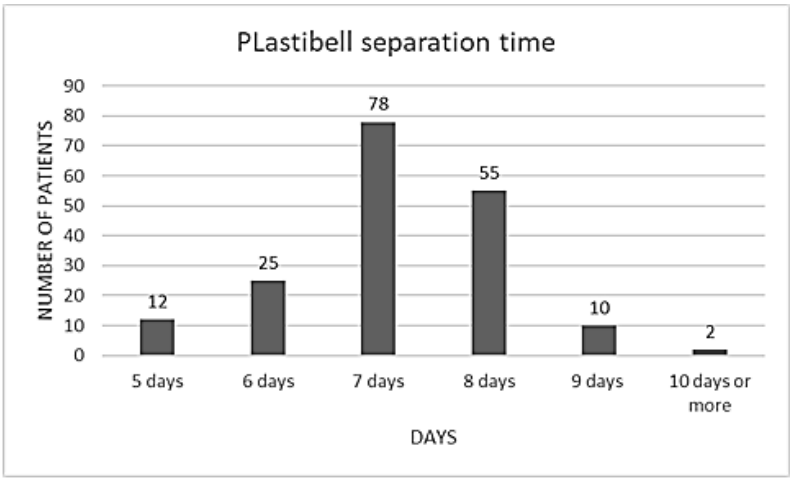

Fig. (5): Plastibell separation time

Regarding post-operative complications (Fig. 5, 6) a reversible penile edema was found in 53 (29.1%) and 34 (20.2%) infants in groups A and B respectively (P value <0.01), while bleeding was the second common complications as it occurred in 3 infants (1.6%) in Group A one of them needed removal of the plastibell and sutures to control the bleeding, while the other two cases were managed conservatively with no statistical significance (NS) and in 15 infants in Group B (8.9%) 10 of them needed sutures to control and compression was sufficient to control the other 5 cases, with statistical significant (P value <0.01). No cases of penile injuries were recorded for (Group A), however 2 infants in Group B had superficial injuries with no further management. In both groups, no reported cases of surgical site infection. For specific Plastibell related complications 2 cases (1.6%) had retention of the plastibell which needed manual removal (NS). In both groups, there were no reported cases of bell migration, glans penis ischemic changes, infection, urinary retention or urethral injuries.

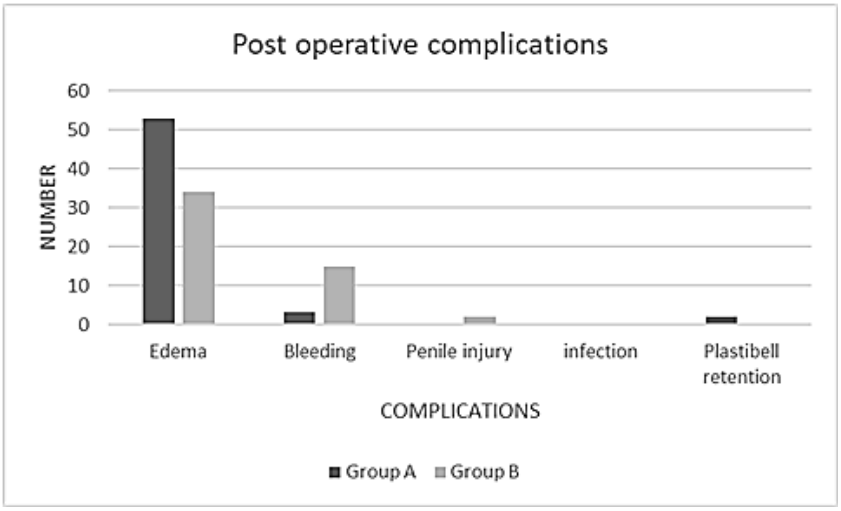

Fig. (6): A clustered column chart showing type of anathesia in both groups

Fig. (7): Post Plastibell complications (edema, incomplete separation and bleeding)

DISCUSSION

Even though male circumcision is one of the oldest surgical procedures since ancient Egyptian history till date with various indications ranging from health related purposes to religious obligations especially in Muslims, Jews and some Christian churches in Africa, [(5)] In addition there are certain medical indications for which parents may ask for circumcision for their infants including phimosis, recurrent balanitis, balanoposthitis, Para phimosis, urine obstruction by tight foreskin opening. [(7)]

lately there are various attempts to withhold it claiming that it represents a sort of abuse and potential harm to the infants which is not based on clinical evidence.[(5)] In contrary, some studies have mentioned the advantages of male circumcision in term of reduction of multiple modes of infections including simple infections up to sexually transmitted viral diseases, moreover, it has been widely accepted that male circumcision can be prophylactic to certain types of malignancies for both males and females as well. [(8-10)]

Despite that circumcision using Bone cutting technique is not standard, it is being used as an established method and it is widely done as a traditional procedure. [(11)] Glans penis skin injuries, partial or complete glandular or penile amputations, meatal trauma are possible complications, [(12-14)] however bleeding and infections are still the most prevalent complications.[(15,16)] While the use of Plastibell in circumcision has been widely applicable particularly in infants up to 1 year old with average 2% complication rate.[(6)]

In this study plastibell technique has favourable outcomes when compared to bone cutting technique in terms of less operative time, less complication rates (Bleeding and injury) and less need for preoperative mode of anathesia. However, the rate of postoperative edema is more common in the plastibell group which is explained by the fact that presence of foreign body with the process of ischemic necrosis and its related inflammatory consequences. All those infants who had penile edema were self-limited with marked improvement on the separation of the device together with the use of warm fomentations.

In literature, an average 10 days were needed for plastibell separation[(17)] other studies considered persistent plastibell device more than 10 days as a complication to the procedure and it mandates surgical separation with rate of 2.6 to 6.93%.[(6,18)] In our study average time of separation was about seven days post procedure and only 2 cases (1.09%) needed surgical removal of the device. It was obvious that proper knot secure with proper fitting over the plastibell is the

most important prophylactic step to reduce slippage of the device, bleeding as well as delayed separation. [6]

In conclusion Plastibell technique for circumcision is a safe and easy procedure with less operative duration and post-operative complications when compared with conventional bone cutting technique.

Conflict of interest:

Ahmed M.S.M. Marzouk has no conflicts of interests to declare in relation to this article.

Statement of informed consent:

Informed consent was obtained from infants' parents included in the study including an consent for video and photos recording for research and learning objectives.

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