

Comparative Study of Early Neonatal Versus Late Circumcision in Terms of Post Operative Complications

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ABSTRACT

Objective: The objective of this study was to compare early neonatal versus late circumcision by plastibell in terms of postoperative complications.

Methodology: It was a comparative study conducted at Department of Pediatric Surgery at Shifa International Hospital Islamabad from January 2018 to November 2019. The present study is a prospective analytical review of 482 uncircumcised patients who presented to the Shifa International Hospital, Islamabad. The variables that were observed in this study were age, mode of presentation, and complications. Patients divided into 2 groups. In Group A circumcision was done within the first 3 days of life and in Group B circumcision was done from in conventional manner after one week of life till 3 months of age.

Results: Total 482 patients were presented during this study period, out of which 70 belong to Group A and 412 belong to Group B. In Group A, bell retraction was seen in 4 patients (5.71%), infection of glans in the form of flakes of pus was seen in 1 patient (1.42%), delayed fall was seen in 2 patients (2.85%) and meatal ulcer was seen in 1 patient (1.42%). In Group B, bell retraction was seen in 8 patients (1.94%), infection in 4 patients (0.97%) and delayed fall in 4 patients (0.97%). Complications like bleeding, over/under circumcision, smegmal cyst, meatal stenosis and urethrocutaneous fistula were not seen in any group.

Conclusion: We conclude that neonatal circumcision done within first 3 days of life or even soon after birth is safe and has no significant difference of complications as compared to patients in whom circumcision is done at a later stage.

Keywords: Circumcision, Plastibell, Postoperative, Complications.

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Introduction

Male circumcision is a widely practiced procedure in many communities.¹ Generally, the complications after circumcision are minor and treatable. Circumcision with plastibell is even simpler but when performed by inexperienced and untrained person the complications may be major and require intervention by expert surgeon. There are different methods of performing circumcision like plastibell, gomco clamp, bone cutter, open technique and surgical blade etc. Circumcision with Mogen device is also reported to be a safe, reliable, and easy to perform procedure in clinical settings with much less complication rates.² Qalam blade method is another alternative method used in the rural areas of Pakistan

especially Khyber Pukhtunkhwa province mostly by half or untrained paramedics, which carries a risk of complications.³ There are different indications for circumcision like religious, ethnic and medical. In our community 85%-90% of circumcisions are performed by untrained and inexperienced persons and not by surgeons. Bone cutter technique is commonly employed. ZACH self-locking circumcision clamp is another alternative technique used by some.⁴ These days plastibell method is widely being practised at many centers and has been assigned to as a safer and preferred method having lesser number of complications over the conventional methods^{5,6}. Other studies have also supported the safety and efficacy of the plastibell technique.⁷

Plastibell is a disposable plastic device with a thread which can either be cotton or nylon. Plastibell is placed on the glans and thread is tied tightly over foreskin which occlude the blood supply of foreskin and causes ischemia at the proposed site of circumcision. Eventually the foreskin gets necrotic and falls off along with the plastibell. Although it is the safest of all the available options but still it has got certain complications like bell retraction, delayed fall or non-separation, bleeding, over/under circumcision, smegmal cyst, meatal ulcer, urethrocutaneous fistula etc.⁸ Parental anxiety persists until the bell falls off. Circumcision can even be performed in patients with bleeding disorder but with proper preparation and involvement of hematologist in the pre-operative preparation of the patient.⁹

Circumcision is mostly done after one week of life up to 1 month, but it can be done till 1 year of age. After that it is preferred to be done under general anesthesia by open technique.

Similar studies have been conducted in other centers and the data support the fact that complications rate between neonates and infants is minimal.¹⁰ We conducted a study in which we have performed circumcision in first three days of life and compared with the conventional practice of doing it after first week of life and compared the results in terms of complications.

Methodology

The present study is a prospective cross-sectional study of 482 uncircumcised patients who fulfilled the inclusion criteria. The duration of the study was 2 years from January 2018 to November 2019. It was conducted at the Department of Pediatric Surgery, Shifa International Hospital, Islamabad. Written informed consent was taken from the parents. The study was conducted after approval from hospital ethical committee. The variables observed in this study were age, mode of presentation and complications. We divided patients in 2 groups, in Group A circumcision was done within first 3 days of life and in Group B circumcision was done in conventional manner after one week of life till 3 months of age. Surgical procedure was performed by single experienced consultant pediatric surgeon in a standard way. Patient was initially examined

physically and enrolled according to inclusion and exclusion criteria. Patient was placed on circumstraint® (purpose-built circumcision table), cleaned with pyodine solution and draped. Local anesthesia administered by injecting 1ml plain xylocaine injection at 2 and 10` clock position at the base of penis (penile block). Foreskin was retracted from the glans and smegma removed. Then dorsal slit was made and appropriate size plastibell was placed holding inner preputial skin with fine artery forceps. The thread was tied over the plastibell using either cotton or nylon, and extra foreskin was trimmed by fine scissor. We didn't apply any dressing on it and patient was sent home on sitz bath in tepid warm water, three times a day till the plastibell falls off and paracetamol oral drops. Patients were followed after 1 week, 1 month and finally after 3 months of circumcision.

Patients with redo circumcision, those having hypospadias, age greater than 3 months, webbed penis, and those having a family history of bleeding disorder were excluded. Data analysis was performed using the SPSS version 21. The mean and standard deviation was done for age as it is a quantitative variable. Frequency and percentage were done for mode of presentation and post-operative complications as it is a qualitative variable. Chi square test was applied to analyze the data.

Results

A total of 482 patients were circumcised during this study period, out of which 70 belonged to Group A and 412 belonged to Group B. The mean age of patients in Group A was 2.33 ± 0.717 days and the mean age in Group B was 32.45 ± 19.970 days.

In Group A, bell retraction was seen in (5.71%) patients, infection of glans in the form of flakes of pus was seen in 1 patient (1.42%), a delayed fall was seen in 2 patients and meatal ulcer was in 1 patient. In Group B, bell retraction was in (1.94%) patients, infection in 4 patients (0.97%), delayed fall in 4 patients (0.97%) and meatal ulcer in 1 patient (0.24%). while no patient was found with complications like bleeding, over/under circumcision, smegmal cyst, meatal stenosis and urethro cutaneous fistula as shown in Table I.

Table I: Distribution of complications in both groups.

Complications		Group A (n=70)	Group B (n=412)	Total (n=482)	P value
Bell retraction	Yes	4(5.71%)	8(1.94%)	12(2.48%)	0.061
	No	66(94.28%)	404(98%)	470(97.51%)	
Delayed fall	Yes	2(2.85%)	4(0.97%)	6(1.24%)	0.188
	No	68(97.14%)	408(84.64%)	476(98.75%)	
Infection	Yes	1(1.42%)	4(0.97%)	5(1.03%)	0.727
	No	69(98.57%)	408(84.64%)	477(98.96%)	
Meatal ulcer	Yes	1(1.42%)	1(0.24%)	2(0.414%)	0.153
	No	69(98.57%)	411(99.76%)	481(99.79%)	

Discussion

Circumcision is being performed by plastibell for more than 60 years.¹¹ Plastibell is a disposable plastic device with a thread which may be cotton or nylon. Plastibell is placed on the glans and thread is fastened tightly over foreskin which occlude the blood supply of foreskin and causes ischemic necrosis of the prepuce skin at the proposed site of circumcision. Eventually the foreskin gets necrotic and falls off along with the plastibell.

There are various complications associated with circumcision via plastibell like bell retraction, delayed fall, bleeding, over/under circumcision, smegmal cyst, meatal ulcer, urethrocutaneous fistula etc.^{8,12-17} We can reduce the complications by careful selection of appropriate size of plastibell and using safe technique.^{8,13,18} Usually plastibell falls off within first week after circumcision and in cases of delayed fall it is manually removed at 10th day. It has been observed that delayed fall of plastibell was noticed in those children in whom parents did not comply strictly to the practice of regular warm sitz bath. Delayed fall causes anxiety to the parents and increases the chances of proximal migration of bell which can lead to serious consequences. The time period of plastibell separation generally depends on the age of the child and early separation is noted in younger children due to thinner skin and easy sloughing.^{8,19-21} Parental satisfaction is critical, and redundant foreskin as a result of undercircumcision causes dissatisfaction and is a common reason for redoing circumcision.^{22,23} In our study, however, not a single patient presented with under-circumcision in follow up. Infection of glans in the form of pus flakes can be easily managed by topical application of antibiotic and sitz bath. The incidence of infection and delayed fall was noticed in those patients in whom parents were non-complaint regarding the practice of warm sitz bath after the procedure. Complications like

bleeding, smegmal cyst, meatal stenosis, urethrocutaneous fistula were not observed in our study.

We have observed that the single most important cause of post circumcision bleeding is retraction of the inner preputial skin. In our series we did not encounter post circumcision bleeding in any patient, the reason being that during application of plastibell we make sure to hold the inner skin separately with an artery forceps in order to prevent its retraction and hence avoid bleeding.

During the procedure, while retracting the prepuce we make sure to wipe out all the smegma meticulously and retract the prepuce completely from the glans till we reach the coronal sulcus. This step avoids smegmal cyst formation.

In many parts of the world, especially Pakistan, circumcision is usually done after one week of life and above as a ritual and due to fear of complications associated with early circumcision. We conducted a study in which we performed circumcision in the first three days of life and compared it with the conventional practice of doing it after first week of life. As shown in our results, we found no significant difference in both groups in terms of complications. In our observation, it does not depend on type of suture material used as concluded by Altokhais et al.²⁴ Simpson et al²⁵ concluded that minimum age for doing circumcision is 12 hours and above otherwise it can cause serious problems. However, in our study we have done circumcision soon after birth without having any serious issues. Elhaik et al²⁶ concluded that neonatal circumcision is associated with sudden infant death syndrome. They revealed that neonatal circumcision is associated with intraoperative and postoperative complications like bleeding, inadequate skin removal, infection, traumatic injury resulting in partial or complete penile amputation, chordee, iatrogenic hypospadias, glanular necrosis, glanular amputation and hemorrhage that can result

in death. They are of the view that this procedure causes significant physiological, behavioral and hormonal changes and adverse events like choking and apnea ultimately leading to death. Moreover, they concluded that this procedure leads to expression of extreme distress like strained and laboured upper limb movement, high-pitched screeches, bilateral arm raising and breath holding. They revealed postoperative pain in neonates with circumcision till 6 weeks of age. A similar study conducted by Moosa FA et al²⁷ supports the same idea of performing circumcision in the early days of life with fewer complications. Another study conducted by Jan IA et al²⁸ concludes that circumcision should better be performed in neonatal age to get best results because of thin and soft foreskin with least number of complications. DA Christakis²⁹ et al describes circumcision in neonatal period a safe procedure and to allay parental anxiety regarding neonatal circumcision.

In one study, secondary phimosis was mentioned as one of the complications of circumcision. The common reason for these complications was mentioned to be poor patient evaluation of anatomical details especially thick pubic fat and buried penis.³⁰ Meatal stenosis has also been seen more common in circumcised males but its incidence as a cause of postoperative complication is still not known.³¹ The major cause of post-circumcision bleeding after plastibell is dorsal mucosal tear and loose knot of the thread, which can easily be prevented. Bleeding from mucosal tear can be prevented by controlling the mucosa with the help of artery forceps at the dorsal slit and bleeding from loose knot can be prevented by applying a secure surgical knot.³² In some reports circumcision has been associated with a high incidence of complications like bleeding, 7-8% in other methods (bone cutter and open method) whereas bleeding is not an issue in our study. Similarly, wound infection has been reported as 5-6% in these methods.³³ When we compare our own study with other centers, the complication rate varies, like 18% bleeding incidence has been reported. Similarly, the incidence of undercircumcision was reported as 18% and in our study, no such case has been recorded.

In our study, we performed circumcision in 70 neonates in Group A and none of the patients developed any serious complications. The majority of

the patients had circumcision at 1st day of life and had uneventful recovery. The overall frequency of post-operative complications was significantly higher in Group B ($p=0.010$) as compared to Group A. We used circumstraint® table, which prevent expressions of extreme distress. By administering proper penile block, patients don't experience pain intra operatively as well as immediately postoperatively. In our immediate follow up, we didn't find any patient with pain.

This study has certain limitations because of not conducting it on a larger scale. Further studies on a larger scale are needed to support this. However, circumcision is extremely safe procedure if done by experienced paediatric surgeon in a proper standard way and serious complications can be avoided.

Conclusion

We conclude that neonatal circumcision done within the first 3 days of life or even soon after birth is safe and has no significant difference in complications as compared to patients in whom circumcision is done at a later stage. We recommend performing circumcision before the discharge of the mother. Thus, the apprehension amongst the medical community regarding early neonatal circumcision is unjustified.

References

1. WHO/UNAIDS. Male circumcision: global trends and determinants of prevalence, safety and acceptability. World Health Organization; 2008.
2. Ullah SU, Samee MU, Islam SU, Imran J, Qammar S, Siddiqui AA. Neonatal and Infantile Circumcision using Mogen Clamp: Experience at a Teaching Hospital Pak J Med Health Sci.2018;12(4):1333-5.
3. Khan Y. Management of Complicated Circumcision in Children. In Islamabad Congress of Ophthalmology 2017.15(2):141-5.
4. Choudhry ZA, Lodhi MF, Ali S, Iqbal MS, Usman M, Azeem MF. Circumcision; A Comparative Study Between ZACH Self-Locking Clamp & Bone Cutter. Annals of Punjab Medical College (APMC). 2021 Mar 31;15(1):6-8. <https://doi.org/10.29054/apmc/2021.1104>
5. Shafaatullah, Bilal Suria, Sadaf Iqbal. Outcome of Plastibell Versus Open Technique for Circumcision in Children. J Surg Pak.2019;24(2):85-8.
6. Amer MS, Mahais AH. Circumcision: Complications Associated with the Plastibell Device and Conventional Dissection Surgery: A Trial of 200 neonates. APMC. 2010;4(1):44-8. <https://doi.org/10.29054/apmc/2010.665>

7. Owais MA, Abbas S, Sharif I, Ahmed K, Arain AG, Soomro BA. Effectiveness of the Plastibell Circumcision in Neonates and Infants at a Tertiary Care Hospital. *Baqai J Health Sci.*2020;23(2):9-14.
8. Mousavi SA, Salehifar E. Circumcision complications associated with the Plastibell device and conventional dissection surgery: a trial of 586 infants of ages up to 12 months. *Adv Urol* 2008;606123:1-5. <https://doi.org/10.1155/2008/606123>
9. Huma Faiz Halepota, Ahmad Vaqas Faruque, Muhammad Arshad. Circumcision in patients with bleeding disorders: Can it be done safely? *J Bahria Uni Med Dental Coll.*2018;8(2):109-13. <https://doi.org/10.51985/JBUMDC2018003>
10. Muhammad Danish Muneeb, Mirza Agha Naushad Baig. Proper Technique Prevents Poor Performance and Fate: a Comparison of Circumcision By Plastibell Method in Neonates and Infants. *J Dow Uni Health Sci.*2019;13(1):37-42. <https://doi.org/10.36570/jduhs.2019.1.616>
11. Kariher DH, Smith TW. Immediate circumcision of the newborn. *Obstet Gynecol* 1956;7(1):50-3.
12. Datta NS, Zinner NR. Complication from Plastibell circumcision ring. *Urology* 1977;9(1):57-8. [https://doi.org/10.1016/0090-4295\(77\)90286-2](https://doi.org/10.1016/0090-4295(77)90286-2)
13. Bode CO, Ikhisemoje S, Ademuyiwa AO. Penile injuries from proximal migration of the Plastibell circumcision ring. *J Pediatr Urol* 2010;6(1):23-7. <https://doi.org/10.1016/j.jpuro.2009.05.011>
14. Edler G, Axelsson I, Barker GM, Lie S, Naumburg E. Serious complications in male infant circumcisions in Scandinavia indicate that this always be performed as a hospital-based procedure. *Acta Paediatr* 2016;105(7):842-50. <https://doi.org/10.1111/apa.13402>
15. Al-Marhoon MS, Jaboub SM. Plastibell circumcision: how safe is it?: experience at sultan qaboos university hospital. *Sultan Qaboos Univ Med J* 2006;6(1):17-20.
16. Thorup J, Thorup SC, Ifaoui IB. Complication rate after circumcision in a paediatric surgical setting should not be neglected. *Dan Med J* 2013;60(8):A4681.
17. Weiss HA, Larke N, Halperin D, Schenker I. Complications of circumcision in male neonates, infants and children: a systematic review. *BMC Urol* 2010;16(10):2. <https://doi.org/10.1186/1471-2490-10-2>
18. Mahomed A, Zaparackaite I, Adam S. Improving outcome from Plastibell circumcisions in infants. *Int Braz J Urol* 2009;35(3):310-3. <https://doi.org/10.1590/S1677-55382009000300007>
19. Jimoh BM, Odunayo IS, Chinwe I, Akinfolarin OO, Oluwafemi A, Olusanmi EJ. Plastibell circumcision of 2,276 male infants: a multi-centre study. *Pan Afr Med J* 2016;23(9):35. <https://doi.org/10.11604/pamj.2016.23.35.7841>
20. Nnamonu MI. Circumcision: experience at a private hospital in jos, Nigeria. *Niger J Surg.* 2013;19(1):1-3.
21. Holman JR, Lewis EL, Ringler RL. Neonatal circumcision techniques. *Am Fam Physician.* 1995;52(2):511-8.
22. Freeman JJ, Spencer AU, Drongowski RA, Vandeven CJ, Apgar B, Teitelbaum DH. Newborn circumcision outcomes: are parents satisfied with the results? *Pediatr Surg Int* 2014;30(3):333-8. <https://doi.org/10.1007/s00383-013-3430-5>
23. Brisson PA, Patel HI, Feins NR. Revision of circumcision in children: report of 56 cases. *J Pediatr Surg* 2002;37(9):1343-6. <https://doi.org/10.1053/jpsu.2002.35005>
24. Altokhais, T., Elsarrag, A., Khan, S., Alshehri, A., & Albassam, A. Neonatal plastibell circumcision: does the thread type matter? a prospective randomized study. *J Pediatr Urol.* 2019 ;15(5):562.e1-562.e5. <https://doi.org/10.1016/j.jpuro.2019.07.015>
25. E Simpson, J Carstensen, P Murphy. Neonatal circumcision: new recommendations & implications for practice. *Mo Med.* 2014; 111(3): 222-230.
26. Elhaik E. Neonatal circumcision and prematurity are associated with sudden infant death syndrome (SIDS). *J Clin Transl Res.* 2019;4(2):136-151. <http://dx.doi.org/10.18053/jctres.04.201802.005>
27. FA Moosa. Comparison of complications of circumcision by 'Plastibell Device Technique' in male neonates and infants. *JPMA* 2010; 60(8):664-667.
28. Jan IA. Circumcision in babies and children with Plastibell technique: an easy procedure with minimal complications-experience of 316 cases. *Pak J Med Sci* 2004; 20: 175-80.
29. Christakis DA, Harvey E, Zerr DM, Feudtner C, Wright JA, Connell FA. A trade-off analysis of routine newborn circumcision. *Paediatrics* 2000; 105: 246-9. <https://doi.org/10.1542/peds.105.S2.246>
30. Mohammad Zafar Iqbal, Mushtaq Ahmad, Shumaila Irum, Tahir Mahmood. Secondary phimosis after circumcision. *Pak J Med Health Sci Dec* 2019;13(4):782-4.
31. Muhammad Safdar Khan, Shehzad Anwar, Khalid Butt, Abdul Mannan, Riaz A Tasneem. Meatal stenosis in circumcised males - Is it preventable? *Ann King Edward Med Uni.* 2007;13(1):78-80.
32. Muhammad Sajjad Ashraf, Muhammad Shahab Athar, Yaqoot Jahan, Muhammad Talat Mehmood. Bleeding following circumcision with plastibel: technical factors and prevention. *Pak J Surg.* 2014;30(2):163-6.
33. Shahzar Malik, Shahzar Malik, Adeel Habib, Riaz Anwar Bashir. Comparison of post circumcision complications and wound healing in infants by conventional open method and bone-cutter method. *Pak Armed Forces Med J.* 2015;65(4):478-81.
34. Awais Ali Khan, Rehan Saleem, Babar Shamim, Maria Shahzadi, Mujahid Zulfikar Ali, Sarwar Alvi. Comparison of circumcision by plastibell versus open method. *Pak Armed Forces Med J.* 2016;66(4):534-7.