

Neonatal Circumcision: First Cut is the Deepest

Chukwubuike Kevin Emeka^{*}

Abstract

Background: Circumcision is the oldest surgical procedure in history and is a frequently performed procedure in neonates. The aim of this study was to evaluate the profile of complications seen in neonates following circumcision.

Materials and Methods: This was a retrospective study of neonate (aged 28 days and below) who developed complications arising from circumcision. The following information was evaluated: age, weight and height of the neonate, presence/absence of congenital anomalies, indications and contraindications for the circumcision, method and complications of circumcision, and outcome of treatment.

Results: A total of 3640 circumcisions were performed during the study period but 182 patients developed complications. This gave a complication rate of 5%. Cultural reason was the most common indication for circumcision and about 10% of the neonates were noticed to have congenital anomalies. Majority of the circumcisions were performed by nurses and plastibell method of circumcision was the predominant modality. Urethrocutaneous fistula was the most common complication arising from the circumcision but there was no mortality.

Conclusion: Neonatal circumcision is a frequently performed procedure in infants. As much as 5% of the neonates developed complications following circumcision. Most of the circumcisions were performed by nurses and cultural reasons were the most common indication for circumcision. Urethrocutaneous fistula was the most common complication recorded and better training is recommended for nurses to minimize these complications.

Keywords: Circumcision; Cultural; Complications; Neonatal; Nurses.

^{*}Pediatric Surgery Unit, Department of Surgery, Enugu State University Teaching Hospital, Enugu, Nigeria

^{*}Corresponding Author Chukwubuike Kevin Emeka Pediatric Surgery Unit, Department of Surgery, Enugu State University Teaching Hospital, Enugu, Nigeria.

Accepted Date: 07-012-2021

Published Date: 08-012-2021

Copyright© 2021 by Chukwubuike KE. All rights reserved. This is an open access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

Introduction

Circumcision is the surgical removal of the prepuce (foreskin) in a male. Arguably, circumcision is the oldest surgical procedure in history [1]. The indications for circumcision include cultural, religious, medical and recently public health reasons [1,2]. The Jews, Muslims, Black Africans, Australian aborigines, and other ethnic groups in different parts of the world practice circumcision on religious and cultural grounds [4]. In developed countries, medical reasons are the most common indication for circumcision: Such medical indications include phimosis, paraphimosis, balanitis, posthitis, localized condylomata acuminata and localized carcinoma of the penis [5]. Reduction in the risk of transmission of HIV infection, urinary tract infection, and other sexually transmitted infections are the public health benefits of male circumcision [6]. Contraindications to neonatal circumcision can generally be grouped into 4 areas: bleeding disorders, inadequate age/health, congenital malformation and insufficient size [7,8]. Circumcision is commonly performed in the neonatal period but it can be performed at any age. However, it is advised that circumcision should be performed during the neonatal period to maximize its health benefits and reduce procedural risk [5]. There are various methods of circumcision [9]. The circumcision methods can be classified into one of the three types or combinations thereof: dorsal slit, shield and clamp and excision [4]. In current practice, the use of shield and clamp is the most common method of circumcision [5]. The aim of this study was to evaluate the profile of

complications seen in neonates following circumcision.

Materials and Methods

This was a retrospective study of neonates (aged 28 days and younger) who developed complications arising from circumcision. This study covered a period of 5 years, between January 2015 and December 2019. Patients who had their circumcision both in Enugu State University Teaching Hospital (ESUTH) and in the peripheral hospital were recruited into the study. However, patients with incomplete medical records were excluded from this study. ESUTH is a tertiary hospital located in Enugu, South East Nigeria. The hospital serves the whole of Enugu State, which according to the 2016 estimates of the National Population Commission and Nigerian National Bureau of Statistics, has a population of about 4 million people and a population density of 616.0/km². The hospital also receives referrals from its neighboring states. Information was extracted from the case notes, operation notes, operation register and admission-discharge records. The information extracted included the age, weight and height of the neonate, presence/absence of other anomalies, indications for the circumcision, contraindications, methods, complications of circumcision, and outcome of treatment. The follow-up period was 6 months. Ethical approval was obtained from the ethics and research committee of ESUTH and informed consent was obtained from the patients' caregivers. Statistical Package for Social Science (SPSS) version 21 (manufactured by IBM Corporation Chicago Illinois) was used

for data entry and analysis. Data were expressed as percentages, median, mean, and range.

Results

Patients' demographics

A total of 3,640 circumcisions were performed during the study period: Out of this number, 182 neonates developed complications and form the basis of this report. This gave a complication rate of 5%. All the patients were males. Baseline characteristics of the patients are shown in Table 1.

Patients' characteristics	Value
Median age	8 days (5-16)
Mean weight	2.4 kilograms (2.0-4.4)
Mean height	51 centimeters (46-60)
The mean duration of hospital stays	5 hours (1-48)

Table 1: Patients' baseline characteristics (n=182).

Clinically obvious congenital anomalies noticed at circumcision

Twenty-two (12.1%) neonates had a clinically obvious anomaly: Six (3.3%) neonates had talipes equinovarus (club foot), 4 (2.2%)

patients each had hydrocephalus, polydactyl and hernia into the cord.

Indications for circumcision
The indications for circumcision are shown in Table 2.

Indications for circumcision	Number of patients (%)
Cultural reasons	102 (56.0)
Medical reasons	62 (34.1)
Religious reason	11 (6.0)
Other reasons (eg social reason)	7 (3.9)

Table 2: Indications for circumcision.

Cadre of personnel that performed the circumcision

The circumcision was performed by registered nurses in 122 (67.0%) neonates, by traditional birth attendants in 42 (23.1%) neonates and by doctors in 18 (9.9%) neonates.

Contraindications to circumcision

There were neonates who could not be circumcised due to one reason or the other. Table 3 shows the contraindications to circumcision.

Contraindications	Number of patients
Hypospadias	24
Micropenis	11
Bleeding disorders	9

Table 3: Contraindications to circumcision.

Methods of circumcision

One hundred and twenty-one (66.5%) neonates were circumcised using plastibell, 31 (17.0%) neonates had guillotine method while 30 (16.5%) neonates underwent free hand method of circumcision.

Complications of circumcision and their treatment

Urethrocutaneous fistula developed in 15 (8.2%) neonates, excessive bleeding was observed in 10 (5.5%) neonates and 9 (4.9%) neonates had buried penis. Other complications were skin bridges in 7 (3.8%) neonates, implantation dermoid cyst in 4 (2.2%) neonates and infection in 2 (1.1%) neonates. The treatments given for the complications were based on the specific complications. For instance, urethrocutaneous fistula was repaired surgically while bleeding was arrested by pressure and vessel ligation.

Outcome of treatment

All the complications were treated appropriately and all the patients achieved full recovery. There was no mortality.

Discussion

Historically, there is evidence of performance of circumcision since ancient times; in Egyptian mummies, in ancient tombs etchings and in Biblical covenants recorded in

the Old Testament [10]. In 1937 edition of Campbell's textbook of Pediatric Urology, circumcision was recommended as a way to improve genital cleanliness and avert masturbation [11]. Prior to deployment in World Wars I and II, there was a military practice of soldier circumcision [12]. Complications risks and severity following circumcision is higher in traditional circumcision as a rite of passage than medical circumcision and conventional circumcision in neonates [5]. Globally, about 25-33% of the world male population is circumcised [13]. The circumcision rate in Nigeria, United States of America and Britain is estimated to be 87%, 70% and 6% respectively [4,14].

The complication rate of 5% recorded in the present study is comparable to the report of other authors [15,16] but at variance with the report of others [14,17]. The complication rates following circumcision may be dependent on the method of circumcision and the experience of medical personnel that performed the circumcision. The median age of the studied neonates is similar to the report of Ekenze et al [18]. However, Nasir et al reported a median age of 21 days [Nasir]. The age at which the neonates presented and the indication for the circumcision may affect the average age of circumcision. There are no specific requirements in terms of weight and height of the neonate before circumcision can be performed. Weight for height, weight for age and height for age are specific parameters

used for research purposes [20]. Circumcisions in neonates are usually performed as day cases. However, the use of general anesthesia for circumcision results in longer hospital stays [21].

In the current study, about one-tenth of the neonates had one anomaly or the other. Club foot was the most common anomaly noticed in the neonates. Chukwubuike et al also reported musculoskeletal anomaly as a common congenital anomaly in neonates [22].

Cultural reason was the most common indication for circumcision in the current study. Ekwunife et al and Malone et al also reported cultural reasons as a common indication for circumcision [23,24]. Other authors found religious reason as the frequent indication for circumcision [16,25]. One series from United Kingdom reported that medical indications for circumcision are rare [24]. Okeke et al documented that none of the children were circumcised in Ibadan, Nigeria for a medical reason [14]. The high rate of neonatal circumcision in Nigeria may explain the paucity of circumcisions performed for medical reasons. Social reasons and public health reasons are other reasons that have advocated for circumcision [25]. About two-thirds of the circumcisions in the index study were performed by nurses. Other series on circumcision from low-income countries also reported that nurses performed the majority of the circumcision [26,27]. This is in contrast to what is obtainable in developed countries where circumcision is performed by doctors [28]. The inexperience, poor technique and poor expertise from the nurses may explain the complications seen in circumcisions performed by nurses.

In the present series, hypospadias was the most common contraindication for circumcision. The prevalence of hypospadias and ability of the nurses and parents to recognize this abnormality may explain the high number of hypospadias detected. Micropenis, which has been defined as stretched penile length of less than 2.5 centimeters measured from the pubic tubercle to tip of the penis, was another contraindication to circumcision [29]. Bleeding following circumcision can be significant and sometimes fatal [28]. Neonates with contraindications to circumcision were not circumcised.

Two-thirds of the neonates were circumcised using plastibell. Other series on circumcision found plastibell circumcision as the most widely used method of circumcision because of its safety and simplicity, ease of use [16, 30].

Urethrocutaneous fistula was the most common complication recorded in the current study. Ademuyiwa et al also found urethrocutaneous fistula as the commonest complication of circumcision [31]. However, bleeding was found as the most common complication by other authors [16,32]. Buried penis may result from cicatrix formation due to overzealous circumcision and is a difficult to manage in children [33].

There was no mortality recorded in the present study. One study from Iran did not report any circumcision related death [34]. Bollinger et al reported 9 deaths per 100, 000 circumcisions performed in United States of America [35]. Mortality following newborn circumcision was more likely to be associated with co-morbidities such as cardiac disease, coagulopathy or pulmonary disorders [36].

Conclusion

Neonatal circumcision is a frequently performed procedure in neonates. As much as 5% of the neonates may develop complications following circumcision. Most of the circumcisions were performed by

nurses and cultural reasons were the most common indication for circumcision. Urethrocutaneous fistula was the most common complication recorded and better training is recommended for nurses to minimize these complications.

References

1. Mokal N, Chavan N. Modified safe technique for circumcision. *Indian J Plast Surg.* 2008;41(01):47-50. [PubMed](#) | [CrossRef](#)
2. Blank S, Brady M, Buerk E. i wsp. Circumcision Policy Statement TASK. *Pediatrics.* 2012; 130:585-6. [PubMed](#) | [CrossRef](#)
3. Morris BJ, Eley C. Male circumcision: An appraisal of current instrumentation. *Biomed Engineering, University of Rijeka, Rijeka.* 2011;315-54. [CrossRef](#)
4. Gerharz EW, Haarmann C. The first cut is the deepest? Medicolegal aspects of male circumcision. *BJU Int.* 2000;86(3):332-8. [PubMed](#) | [CrossRef](#)
5. Abdulwahab-Ahmed A, Mungadi IA. Techniques of male circumcision. *J Surg Tech Case Rep.* 2013;5(1):1-7. [PubMed](#) | [CrossRef](#)
6. Bitega JP, Ngeruka ML, Hategekimana T, Asimwe A, Binagwaho A. Safety and efficacy of the PrePex device for rapid scale-up of male circumcision for HIV prevention in resource-limited settings. *JAIDS J Acquir Immune Defic Syndr.* 2011;58(5): e127-34. [PubMed](#) | [CrossRef](#)
7. Hutcheson JC. Male neonatal circumcision: indications, controversies and complications. *Urol Clin North Am.* 2004;31(3):461-7. [PubMed](#) | [CrossRef](#)
8. Lerman SE, Liao JC. Neonatal circumcision. *Pediatr Clin North Am.* 2001;48(6):1539-57. [PubMed](#) | [CrossRef](#)
9. Tucker SC, Cerqueiro J, Sterne GD, Bracka A. Circumcision: a refined technique and 5-year review. *Ann R Coll Surg Engl.* 2001;83(2):121. [PubMed](#)
10. Simpson E, Carstensen J, Murphy P. Neonatal circumcision: new recommendations & implications for practice. *Mo Med.* 2014;111(3):222. [PubMed](#)
11. Campbell MF. *The male Genital Tract and Female Urethra, and Operations on the Penis and Urethra.* Pediatric Urology. New York. The Macmillan Company. 1937:465-67.
12. Dunsmuir W, Gordon EM. The history of circumcision. *BJU Int.* 1999 Jan 1;83(s 1):1-2. [PubMed](#) | [CrossRef](#)
13. Circumcision M. *global Trends and Determinants of Prevalence, Safety and Acceptability.* Geneva: World Health Organization and Joint United Nations Programme on HIV. AIDS. 2007.
14. Okeke LI, Asinobi AA, Ikuerowo OS. Epidemiology of complications of male circumcision in Ibadan, Nigeria. *BMC Urol.* 2006;6(1):1-3. [PubMed](#) | [CrossRef](#)
15. Singh-Grewal D, Macdessi J, Craig J. Circumcision for the prevention of urinary tract infection in boys: a systematic review of randomised trials and observational studies. *Arch Dis Child.* 2005;90(8):853-8. [PubMed](#) | [CrossRef](#)
16. 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(1). [PubMed](#) | [CrossRef](#)
17. Kim JK, Koyle MA, Chua ME, Ming JM, Lee MJ, Kesavan A, et al. Assessment of risk factors for surgical complications in neonatal circumcision clinic. *Can Urol Assoc J.* 2019;13(4): E108. [PubMed](#) | [CrossRef](#)
18. Ekenze SO, Ezomike UO. Complications of neonatal circumcision requiring surgical intervention in a developing country. *J Trop Pediatr.* 2013;59(4):292-7. [PubMed](#) | [CrossRef](#)
19. Nasir AA, Bamigbola KT, Abdur-Rahman LO, Adeniran JO. Choosing an appropriate Plastibell size for infant circumcision. *J Clin Sci.* 2018;15(3):123. [CrossRef](#)

20. Kose E, Yavascan O, Turan O, Kangin M, Bal A, Alparslan C, et al. The effect of circumcision on the frequency of urinary tract infection, growth and nutrition status in infants with antenatal hydronephrosis. *Ren Fail.* 2013;35(10):1365-9. [PubMed](#) | [CrossRef](#)
21. Bicer S, Kuyrukluylidiz U, Akyol F, Sahin M, Binici O, Onk D. At what age range should children be circumcised? *Iran Red Crescent Med J.* 2015;17(3). [PubMed](#) | [CrossRef](#)
22. Chukwubuike KE, Ozor I, Enyi N. Prevalence and pattern of birth defects in the two tertiary hospitals in Enugu, South East Nigeria: A hospital-based observational study *Afr J Paediatr Surg.* 2020;17(3-4):85. [PubMed](#) | [CrossRef](#)
23. Ekwunife OH, Ugwu JO, Okoli CC, Modekwe VI, Osuigwe AN. Parental circumcision preferences and early outcome of plastibell circumcision in a Nigerian tertiary hospital. *Afr J Paediatr Surg.* 2015;12(4):251. [PubMed](#) | [CrossRef](#)
24. Malone P, Steinbrecher H. Medical aspects of male circumcision. *BMJ.* 2007;335(7631):1206-90. [PubMed](#) | [CrossRef](#)
25. Hamza BK, Ahmed M, Bello A, Sholadoye TT, Tolani MA, Lawal AT, et al. Comparison of the efficacy and safety of circumcision by freehand technique and Plastibell device in children. *Afr J Urol.* 2020;26(1):1-7. [CrossRef](#)
26. Maison PO, Yahaya I, Mensah S, Apraku C, Egyir E. An assessment of the training and practice of circumcision by medical circumcisers in Ghana. *Afr J Urol.* 2020;26(1):1-4. [CrossRef](#)
27. Osifo OD, Oriaifo IA. Circumcision mishaps in Nigerian children. *Ann Afr Med.* 2009;8(4):266. [PubMed](#) | [CrossRef](#)
28. Sorokan ST, Finlay JC, Jefferies AL, Canadian Paediatric Society, Fetus and Newborn Committee, Infectious Diseases and Immunization Committee. Newborn male circumcision. *Paediatr Child Health.* 2015;20(6):311-5. [PubMed](#) | [CrossRef](#)
29. Al-Hazmi H, Traby M, Al-Yami F, Kattan AE, Al-Qattan MM. Penile reconstruction in a newborn following complicated circumcision: a case report. *Int J Surg Case Rep.* 2018; 51:74-7. [PubMed](#) | [CrossRef](#)
30. Bawazir OA. A controlled trial of Gomco versus Plastibell for neonatal circumcisions in Saudi Arabia. *Int J Pediatr Adolesc Med.* 2020 7(3):132-5. [PubMed](#) | [CrossRef](#)
31. Ademuyiwa AO, Ojewola RW, Elebute OA, Jeje EA, Bode CO. Surgically correctable morbidity from male circumcision: indications for specialist surgical care in lagos. *Niger J Surg.* 2012;18(2):71-4. [PubMed](#) | [CrossRef](#)
32. Moradi M, Kaseb K, Rezaee H. Giant urethrocutaneous fistula following ritual circumcision in an infant with congenital anterior urethral diverticula. *SAGE Open Med Case Rep.* 2017; 5:2050313X17745205. [PubMed](#) | [CrossRef](#)
33. Stephen JR, Burks FN. Buried penis repair: tips and tricks. *Int Braz J Urol.* 2020; 46:519-22. [PubMed](#) | [CrossRef](#)
34. Hedjazi A, Zarenezhad M, Hosseini SM, Fereidooni M, Ghadipasha M, Rad BS, et al. Epidemiology of circumcision-related mortality in Iran: a 10-year survey. *N Am J Med Sci.* 2012;4(11):608. [PubMed](#) | [CrossRef](#)
35. Bollinger D. Lost boys: an estimate of US circumcision-related infant deaths. *Boyhood Studies.* 2010;4(1):78-90. [CrossRef](#)
36. Earp BD, Allareddy V, Allareddy V, Rotta AT. Factors associated with early deaths following neonatal male circumcision in the United States, 2001 to 2010. *Clin Pediatr.* 2018;57(13):1532-40. [PubMed](#) | [CrossRef](#)