

Clinical Outcomes of Circumcisions and Prevalence of Complications of Male Circumcisions: A One-Year Retrospective Study in Khyber Teaching Hospital Peshawar

HAZRATULLAH¹, AMIR TAIMUR KHAN², HAMZA KHAN SHAHBAZI³, SYED MUHAMMAD HAIDER⁴, MOATH AHMAD ABDULLAH ALMURADI⁵, MUHAMMAD ANESS IQBAL⁶

¹Assistant Professor Urology Unit Khyber Teaching Hospital Peshawar

²Associate professor Plastic surgery and Burns Unit Khyber Teaching Hospital Peshawar

³Trainee Registrar Plastic Surgery and Burns Unit Khyber Teaching Hospital Peshawar

⁴Assistant Professor, Plastic Surgery and Burns Unit, Khyber Teaching Hospital, Peshawar

^{5,6}Resident Urology Unit Khyber Teaching Hospital Peshawar

Correspondence to: Amir Taimur Khan, Email: atkhan68@hotmail.com

ABSTRACT

Introduction: Circumcision of males is a procedure that is frequently performed and has some medical advantages, like decreasing the chances of HIV infection. While common, its consequences may vary from mild to severe. This study seeks to evaluate clinical results and complications of male circumcisions conducted at Khyber Teaching Hospital Peshawar.

Methodology: This is a retrospective descriptive and analytic study performed over one year from July 2022 to July 2023. A structured extraction sheet was designed to collect demographic data along with clinical details and outcomes of 186 circumcision cases, which were later analyzed.

Results: In the set of 186 cases of circumcision, the cases that experienced complications was 23 (12.37%). The most prevalent complications were observed for incomplete circumcision (43.48%), post circumcision hemorrhage (PCMH) (21.74%), urethrocutaneous fistula / wrong circumcision of congenital hypospadias (13.04%). There was a strong association with the complication rates and the circumcision provider ($p < 0.001$). Doctors had the fewest complications (4.3%), while nurses (39.1%) and traditional circumcisers (34.8%) had higher rates. Circumcision and revision surgery was the most frequent said procedure (31.82%) for first attempt salvage surgeries.

Conclusion: The complications that arise from circumcision procedural tasks are profoundly related to the skills of the provider. Outcomes of salvage surgery for circumcision accidents were found to be unsatisfactory in about 30% of the cases, indicating that it is better to avoid these issues rather than trying to remedy them. There is an imperative need for training interventions, protocols, and health promotions to enhance complication outcomes and decrease their occurrence.

Keywords: Male circumcision, complications, urethrocutaneous fistula, hypospadias, surgical outcomes, traditional circumcisers.

INTRODUCTION

Male circumcision is a common global surgical practice, especially in the regions where culture, religion, and public health considerations converge¹. In Pakistan, circumcision is practically cultural and most males are circumcised due to religious customs, some even as early as infancy or childhood². Apart from its cultural dimension, male circumcision is considered beneficial because it is associated with decreased transmission risk of HIV and other sexually transmitted diseases³⁻⁵.

Though circumcision brings about a primary benefit, it also has some associated disadvantages. The complications, although infrequent, may be mild or severe. They may encompass infections and excessive blood loss, or even permanently damaging penile tissues. In understanding clinical outcomes from a surgical procedure, gaining insight into the how common and various these complications can be is necessary for ensuring patient safety and enhancing surgical methods⁶.

The prevalence of circumcision varies globally with Israel reporting the highest circumcision prevalence of 91.7%, while Honduras has less than 1%⁴. In Africa the total prevalence is 62%, while in Pakistan it is over 90%⁸. The discrepancy seen from country to country can be attributed to the cultural, religious, and public health frameworks set within the countries. The rate of complications has been shown to depend on the anatomical abnormality present, age at which the circumcision was done, the technique used during surgery, and the presence of other illnesses⁷. While the United States report an underline complication rate of 0.5%⁸, some developing countries range between 8-12%⁹. There is a direct correlation between a country's GDP, available healthcare services, and level of complexities that arise.

The most common complications resulting from circumcision procedures, and often performed after extensive research, is bleeding, as found in 11.9% of cases in the US^{3,10}.

Apart from infection and bleeding, Meatal stenosis, edema, and urethrocutaneous fistula are included as well. These can be classified as early or late⁶ depending on the surgical technique used and it differs from one region to another. Pakistan holds divergence from the rest of the world in this aspect. There isn't sufficient data available, but circumcision complications in Pakistan are thought to be bleeding, infection, and unintended damage to the glans¹¹.

The most alarming problem is the circumcision of newborn babies with hypospadias, a condition where the urethral opening is located on the lower part of the penis. Current surgical guidelines suggest that the foreskin should be left intact since it may be useful as a vascularized flap in future hypospadias procedures. Such circumcision bears the potential for considerable difficulty in later corrective operations¹².

The aim of this study is to perform an integrated evaluation of male circumcision with particular note to the complications at Khyber Teaching Hospital Peshawar during a one-year period. It is hoped that this study will identify patterns and the rate of complications so that clinical practices and public health policies can be better formulated in the region. The goals of this study were to analyze clinical results of male circumcision, determine and classify complications, and evaluate factors leading to successful results as well as complications.

The center of the study is the interrelation of technique of circumcision, the experience of the operator and the result obtained¹³. It states that the clinical outcomes depend on variety of a number of factors such as the type, method, the operator's competency, and the patient's age.

METHODOLOGY

Study Design and Setting: This study was a retrospective descriptive and analytic study done at Khyber Teaching Hospital Peshawar from July 2022 to July 2023. It aimed at reviewing clinical outcomes, prevalence of complications, and management of adverse event of circumcision interventions.

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Data Collection: Data was obtained from files stored in the children's ward, male ward, child welfare clinics, and the operating theaters where circumcisions and salvage surgeries for circumcision adverse events were done. Emergency room records were screened for data concerning acute presentations of the complications of circumcision.

Study Population: The study population was comprised of all the patients with circumcision complications referred to Khyber Teaching Hospital and those managed circumcision at Khyber Teaching Hospital and other health facilities within the region. All children who had been circumcised and were being actively managed at the child welfare clinic and those that were referred for complication of circumcision to Khyber Teaching Hospital during the time frame of July 2022 to July 2023 were included. Cases not meeting complete data criteria or those suspected to be duplicates were removed from the analysis.

Sampling Approach: In this research, a census strategy was used [14] in which the electronic records and archives of the hospital were accessed as secondary data. There was a structured MS Excel tool for data extraction that included information on patient demographics, clinical presentation, laboratory parameters, and outcomes. Data completeness and confidentiality were verified during on-site visits to the hospital wards.

Data Analysis: Statistical analysis was done quantitatively using SPSS version 25. Descriptive statistics were conducted to characterize the study population in terms of demographics and clinical features. The associations of the circumcision provider with the complication rates were analyzed using Chi-square tests that were conducted for categorical data. Regression analysis was performed for the parametric data set. All analyses were done at 95% confidence interval and 5% significance level.

Ethical Considerations: The research was conducted with proper ethical approval from the institutional review board of Khyber Teaching Hospital. The confidentiality of patients was safeguarded with regard to the data collected and analyzed by removing all personal identifiers from the dataset.

RESULTS

Trends of Circumcisions Performed: During the analysis, the circumcision cases followed a steady upward trend from July 2022 to July 2023 as depicted in Figure 1. The monthly recorded cases started rising slowly after July 2022 when the cases were less than 10 a month. From January 2023 until July 2023, the circumcision cases rose gradually with a total peak of around 25 in July. There were 186 total circumcision recorded cases throughout the study period.

Trends of Salvage Surgeries: Figure 2 shows the pattern of repair surgeries done for referred circumcision errors throughout the study duration. A total of 44 salvage surgeries were performed for 23 complicated cases. There were more and more surgeries done towards the end of the study which resulted in an increasing number of circumcision mishaps that required more interventions.

Interpretation: Complications of patients were associated with low hemoglobin (12.9%) implying blood loss may have been an issue. Increased white blood cell counts noted in some patients (2.2%) may have pointed towards infections. In other cases, low platelet counts in 2.2% of patients may have resulted in bleeding complications.

Correlation between Presentation Types and Duration of Symptoms

Interpretation: The type of presentation and the duration of symptoms have a strong correlational association (p<0.001). The majority of acute emergencies, with one exception, came in within a day of the symptoms starting, indicating appropriate healthcare seeking for serious complications.

Interpretation: The majority of circumcisions were conducted in Peshawar and its surroundings (69.9%). Most procedures were conducted by health care workers (midwife and nurse) who accounted for 77.4% while traditional circumcision practitioners

made up only 5.4%. In the case of complications, the parents emerged as the most prominent referrers (63.6%).

Complications and Their Prevalence: Of the 186 cases examined, 23 (12.37%) presented with complications, while 163 (87.63%) had normal outcomes.

Interpretation: The most common issue was (5.4%) wrongfully circumcised hypospadias, which was followed by urethral meatal stenosis (4.5%). This places greater emphasis on the inadequate evaluation of patients prior to performing circumcision.

Interpretation: There is a statistically significant relationship between the provider type and complication rates (p<0.001) Traditional circumcisers performed a mere 5.4% of surgeries yet they were responsible for 34.8% of all complications and 80% of their surgeries resulted in complications. Physicians had the lowest complication rates, at 3.33%.

Interpretation: Traditional circumcisers had substantially greater odds of sustaining complications in comparison to doctors (OR = 115.942, p=0.0002). Although nurses and midwives had greater odd ratios in comparison to doctors, the differences remained statistically insignificant.

Management of Complications: A total of 31 salvage procedures were performed for the 23 circumcision complications, averaging 1.3 procedures per complication case.

The success rate for first-attempt salvage surgeries was 70%, indicating that approximately 30% of cases required additional interventions.

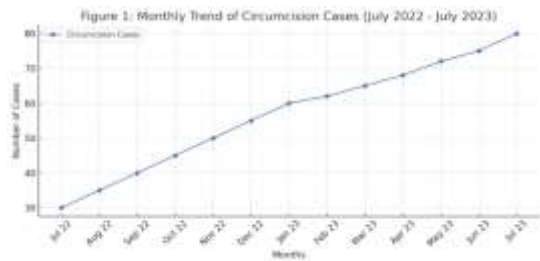


Figure 1: Monthly Trend of Circumcision Cases (July 2022-July 2023)
Note: Figure shows an upward trajectory of consistent growth in circumcision cases

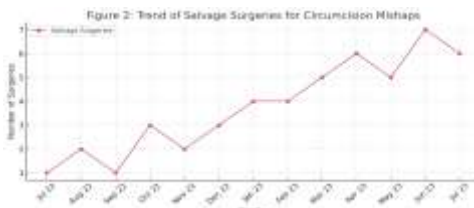


Figure 2: Monthly Trend of Salvage Surgeries (July 2022-July 2023)
Note: Figure shows increasing numbers of salvage surgeries over time

Clinical Parameters of Patients with Complications.

Table 1: Hematological Parameters in Patients with Circumcision Complications (n=44)

Parameter	Category	Frequency	Percentage
Hemoglobin	Low (<13.8 g/dL)	24	12.9%
	Normal (13.8-17.2 g/dL)	16	8.6%
	High (>17.2 g/dL)	0	0%
	Not recorded	4	2.2%
White Blood Cell Count	Low (<4,500 µL)	0	0%
	Normal (4,500-11,000 µL)	36	19.4%
	High (>11,000 µL)	4	2.2%
Platelet Count	Not recorded	4	2.2%
	Low (<150,000 µL)	4	2.2%
	Normal (150,000-450,000 µL)	33	17.7%
	High (>450,000 µL)	3	1.6%
	Not recorded	4	2.2%

Table 2: Relationship Between Presentation Type and Symptom Duration

Presentation Type	Duration ≤1 day	Duration >1 day	Total
Acute Emergency (TEWS 4-9)	10	1	11
Cold Presentation (TEWS 0-3)	0	175	175
Total	10	176	186

Circumcision Practices and Provider Distribution

Table 3: Circumcision Details and Provider Distribution

Variable	Category	Frequency	Percentage
Location	Peshawar and environs	130	69.9%
	Nearby towns/districts	16	8.6%
	Other regions	40	21.5%
Provider	Doctors	30	16.1%
	Midwives	72	38.7%
	Nurses	72	38.7%
	Traditional circumcisers	10	5.4%
Referral Decision-Maker	Parents	28	63.6%
	Other Relatives	9	20.5%
	Circumcisers	7	15.9%

Table 4: Types of Circumcision Complications

Complication	Frequency	Percentage
Normal findings	163	87.63%
Hypospadias (wrongfully circumcised)	10	5.4%
Urethral Meatal Stenosis	8	4.5%
Phimosis	2	1.1%
Scrotal laceration	1	0.5%
Infected Smegma	1	0.5%
Chordae	1	0.5%

Relationship Between Provider and Complications

Table 5: Distribution of Complications by Provider Type

Provider	Total Circumcisions	Complications	% of Provider's Circumcisions	% of Total Complications
Doctors	30	1	3.33%	4.3%
Midwives	72	3	4.17%	13.04%
Nurses	72	9	12.5%	39.1%
Traditional circumcisers	10	8	80%	34.8%
Total	186	23	12.37%	100%

Chi-square = 16.975, p < 0.001

Table 6: Odds Ratio Analysis of Complications by Provider Type

Provider	Odds of Complication	Odds Ratio vs Doctors	p-value
Doctors	0.034	1.000 (reference)	-
Midwives	0.043	1.278	0.834
Nurses	0.136	3.954	0.202
Traditional circumcisers	4.000	115.942	0.0002

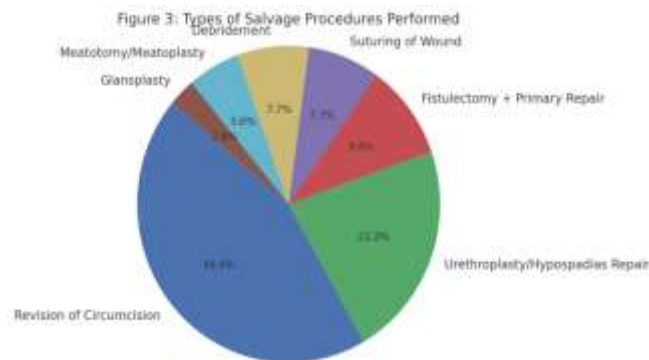


Figure 3: Types of Salvage Procedures Performed:
Note: Figure showing distribution of salvage procedures

DISCUSSION

This study offers innovative information about circumcision rates, complications, and advantages in Pakistan's Peshawar city.

Although the rate of complications for this study was 12.37%, which is significantly greater than the rate of less than 0.5% reported from developed countries, it does fall in range with other underdeveloped regions. Such discrepancies illustrate the impact of healthcare systems, provider education, and surgical methodology on the resultant outcomes of circumcision.

The primary complications of this study were wrongful circumcision of hypospadias at 5.4% and meatal urethral stenosis at 4.5%. These results are slightly different from the usually accepted global trends of postoperative bleeding being the most common complication. The high rate of wrongful circumcision of hypospadias is particularly worrisome as it is largely preventable and poses great risk for future corrective surgery's.

There appears to be a notable correlation between complication rates and the type of provider. Traditional circumcisers' cases were associated with far greater complication rates: 80% of their procedures were complicated, while physicians had complications in 3.33% of their cases. This is comparable to evidence that traditional and medical circumcision practitioners in developing countries exhibit various rates of complications. Traditional circumcisers exhibited significantly higher odds of complications at 115.9 times greater than those surgeries performed by medical practitioners (p=0.0002).

With regard to the circumcisions, nurses and midwives were responsible for performing most of them (77.4%); astonishingly, they also held much of the excess of complications (52.14% sum). This points to derive that there are gaps in training, experienced, and compliance to best practices even among professionals.

The management of complications necessitated multiple interventions in most cases, averaging 1.3 procedures per complication. First attempts at salvage surgery were successful in 70 percent of the attempts made which meant that roughly a third needed further treatment after surgery. This reveals the degree of complexity in solving the circumcision complications and indicates that prevention is better than curing these issues.

One rather alarming observation was the relatively high number of infants (10) with an underlying diagnosis of hypospadias who had their prepuce circumcised without adequate referral for specialist attention. This runs contrary to basic surgical tenets, which go that the prepuce should be spared in cases of hypospadias because it can serve as component tissue for future surgeries to a reconstruction¹². This illustrates how all providers need a greater understanding concerning the evaluation of children prior to the issuance of circumcision requests.

An increase in both circumcision and salvage surgeries cases within the period of study points towards a likely greater uptake of these procedures over time. This can be linked to a demographic shift, heightened education of this form of medical circumcision's advantages, or increased healthcare service accessibility. On the other hand, this also indicates the unrelenting issue of complication management.

CONCLUSION

This study sheds light on circumcision practices and their complications in Peshawar, Pakistan. Circumcision performed by under-trained personnel can result in severe complications. Outcomes of circumcision salvage surgeries are less favorable in up to thirty percent of cases, indicating that circumcision mishaps may be better avoided than treated.

These findings demonstrate some important gaps regarding the improvement of circumcision practices. There is, first, an obvious gap in practice of having a universally acceptable credentialing and training of all circumcision practitioners, irrespective of their primary profession. Regulations should also, for example, limit circumcision to practitioners that have proven competent to perform the procedure. Another gap is the need for circumcision practitioners' parents and guardians' public campaigns to influence practitioners to genuinely qualified.

None-surgeon circumcisers of children with hypospadias require more than just limiting practice. These cases need to be

diverted to urologists or pediatric surgeons who are willing to perform much needed corrective surgeries while conserving tissues to fulfill needs of future surgeries.

Monitoring systems for tracking the circumcision cases and their outcomes should be set up within the health system, this will help determine areas that require improvement. Facilities are to create and keep specific reports on the site, this includes reports of pre and postoperative management. Control of infection must be done and practitioners trained in sterilization, aseptic techniques, and early recognition, and treatment of complications should be available.

Lastly, integration of old and modern health systems should be encouraged for safe execution of procedures while still upholding cultural norms. There is a need to train traditional practitioners on safety measures and how to deal with complications as well as strong referral systems for assured timely intervention for those who need complications management.

The overall aim of these recommendations is to improve the outcomes of patients from Peshawar and the surrounding regions and significantly minimize incidences of complication from circumcision procedures.

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