

## Post Circumcision Bleeding: Causes and Outcome in Different Age Groups

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### Abstract

**Objective:** To determine the frequency of post-circumcision bleeding and its outcome in terms of need of admission, blood and blood product transfusions and surgical procedure to secure hemostasis in children presenting to NICH.

**Materials and Methods:** It was a cross sectional descriptive study conducted at NICH for 1-year duration. A total of 126 patients of post circumcision bleeding were included.

**Results:** The study was done from 2-12-2013 to 4-12-2014 for duration of 1 year and 2 days. Age and weight were stratified according to mean. All patients presenting with injury to penile tissues leading to bleeding were included. 29 (23%) patients needed admission and blood transfusion. Statistically significant association found between need for admission and person or/and method of circumcision. Most severe injuries were caused by paramedic and nonmedical persons.

**Conclusion:** Circumcision is a minor procedure when done by experienced and trained circumciser. There is need to raise awareness that it is more of a surgical procedure than just a ritual. Education of parents is needed in conjunction with training of the circumciser to prevent life threatening complications.

**Keywords:** *Post Circumcision Bleeding; Penile Injury; Methods of Circumcision*

### Introduction

Circumcision is the commonest as well as the oldest ritual procedure practiced on earth. An estimated one out of three males in world are circumcised [1]. In Pakistan, where more than 95% population is Muslim, it is customary for all Muslim males to undergo circumcision and a vast majority is circumcised by non-medical persons including traditional Jarrahs and barbers. Although they are doing it for generations, complications still happen because of technical and non-technical reasons. These complications may range from trivial ones to catastrophes which may lead to deaths as studies show [2].

There are several studies focusing on complications of circumcision and excessive bleeding being commonest in almost all [1]; however no study specifically targets bleeding complication and its outcome.

Bleeding in relation to circumcision can occur due to many different reasons which can be broadly classified under technical or non-technical causes. In technical errors, there may be injury to penile tissues like glans injury, urethral injury or partial or complete penile amputation [3]. Non-technical factors may involve diseases involving defect in blood coagulation or bleeding diathesis or other comorbidities [4].

In Pakistan, where majority of circumcisions are being done by non-medical personnel, it is expected that both of above factors contribute to post circumcision bleeding imposing health costs secondary to preventable issues. Even around the globe, most of the studies are retrospective reporting morbidity and mortality of post circumcision bleeding in addition to other complications. To best of our knowledge, no prospective study found targeting bleeding complications and their outcome in national and international literature. Hence there is a dire need to conduct a study focusing on causes of bleeding related to procedure of circumcision and its outcome in terms of hospital stay and further surgery if needed. The data will help us to identify the factors leading to post circumcision bleeding and its impact on patients so that strategies could be developed to overcome morbidity.

### Materials and Methods

A cross sectional descriptive was carried out at department of Paediatric Surgery National Institute of Child Health (N.I.C.H) Karachi from 2-12-2013 to 4-12-2014 for a period of 1 year. All procedures followed were in accordance with the ethical standards of the responsible committee on human experimentation (institutional and national) and with the Helsinki Declaration of 1975, as revised in 2008. Informed consent was obtained from all subjects for being included in the study and details of research were discussed with parents.

The sample size was calculated using following formula:

Post circumcision bleeding requiring suture repair (P) = 8.9% [5]

Confidence interval (C.I) = 95%

Maximum error (d) = 5%

$Z_{\alpha/2} = 1.96$

$$n = \frac{Z_{\alpha/2}^2 P(1 - P)}{d^2} = 126$$

Consecutive sampling was done. All patients with ages 7<sup>th</sup> day of life to 5 years presenting with history of bleeding following circumcision from the circumcised site were included. Bleeding from penis due to a cause other than circumcision and patients with family history of bleeding disorders were excluded.

Patients meeting the inclusion and exclusion criteria were registered from the Out-Patient Clinics and Emergency Room. Family history for bleeding disorders and history regarding circumciser was taken. Physical examination for presence or absence of shock was done in which pulse, blood pressure, capillary refill and skin color and temperature was recorded. Cause of bleeding was looked for and the procedure done to secure hemostasis like pressure application, bipolar cautery or suturing the bleeding vessels was noted.

Need for blood or blood products transfusion was evaluated based upon pale conjunctivae and estimation of Hb% (less than 7 mg/dl).

The data was collected on a Performa and was kept confidential. A standard of care treatment was provided to all the patients.

The data was entered and analyzed using SPSS version 20. Stratification with respect to age, weight, circumciser and method of circumcision was done. Post stratification Chi square test was applied and a “p” value of  $\leq 0.05\%$  was taken as significant. Mean and Standard Deviations were calculated for age and weight. Percentages were calculated for categorical variables such as penile injury, hospital admission, blood transfusions and surgical intervention.

### Results

A total of 126 patients presenting with post circumcision bleeding to NICH were included. The demographics are shown in table 1.

|                        |                  |                   |
|------------------------|------------------|-------------------|
| Age (days)             | 542.2 (7 - 1825) |                   |
| Weight (Kg)            | 8.02 (2.3 - 20)  |                   |
| Circumciser            | Doctor           | 67 (53.2%)        |
|                        | Paramedic        | 41 (32.5%)        |
|                        | Non-medical      | 18 (14.3%)        |
| Method of Circumcision | Plastibell       | 45 (35.7%)        |
|                        | Clamp            | 15 (11.9%)        |
|                        | Free hand        | 13 (10.3%)        |
|                        | Bone cutter      | 53 (42.1%)        |
| Secondary outcome      | Admission        | Yes = 29 (23%)    |
|                        |                  | No = 97 (77%)     |
|                        | Transfusion      | Yes = 28 (22.2%)  |
|                        |                  | No = 98 (77.8%)   |
|                        | Surgery          | Yes = 115 (91.3%) |
|                        |                  | No = 11 (8.7%)    |

**Table 1:** Descriptive of study patients (n = 126).

Post circumcision bleeding and penile injury was present in 100% (n = 126) patients. Secondary outcome was hospital admission. Twenty-nine (23%) patients required admission, 28 (22.2%) required blood or blood products transfusion and 115 (91.3%) patients needed surgical intervention in the form of suturing and/or bipolar cautery to secure hemostasis.

Post-stratification significant association was found between circumciser, need for hospital admission and transfusion requirements (Table 2). However, type of association couldn't be determined and need further evaluation. Relation of age and weight to hospital admission, blood transfusions and surgery was statistically insignificant. Similarly, association between circumciser and need for surgery was insignificant.

| Circumciser | Admission/Transfusion |       | P value                                    |
|-------------|-----------------------|-------|--|
|             | Yes                   | No    |  |
| Doctor      | 9/9                   | 58/58 | Admission = 0.018*<br>Transfusion = 0.036* |
| Paramedic   | 15/14                 | 26/27 |  |
| Non-medical | 5/5                   | 13/13 |  |
| Total       | 29/29                 | 97/97 | 126  |

**Table 2:** Association of Circumciser to Admission and transfusion.

\*Considered significant at 0.05.

Another significant association was found between method of circumcision and transfusion requirement. However, the association between method of circumcision and need for admission or surgery was not statistically significant (Table 3).

**Discussion**

Circumcision is performed in 1/3<sup>rd</sup> of all men around the globe for various reasons, most common being ritual. There are various tech-

| Method of circumcision | Transfusion |    | Circumciser |           |             | P value                                      |
|------------------------|-------------|----|-------------|-----------|-------------|--|
|                        | Yes         | No | Doctor      | Paramedic | Non-medical |  |
| Plastibell             | 5           | 40 | 31          | 14        | 0           | Transfusion = 0.014*<br>Circumciser = 0.000* |
| Clamp                  | 3           | 12 | 4           | 2         | 9           |  |
| Free hand              | 7           | 6  | 4           | 5         | 4           |  |
| Bone cutter            | 13          | 40 | 28          | 20        | 5           |  |
| Total                  | 28          | 98 | 67          | 41        | 18          | 126  |

**Table 3:** Association of method of circumcision to transfusion.

*\*Considered significant at 0.05.*

niques and in any technique, asepsis, adequate excision of inner and outer preputial layers, hemostasis and cosmesis are important. Multiple studies have demonstrated that most of the complications are on the part of surgical technique and experience of circumciser [6-8]. In Pakistan where majority of population is Muslim, literacy rate and socioeconomic status is low, majority of the people go to traditional circumcisers or paramedical staffs' private clinics for circumcision as they usually cost much lower than a hospital. Public sector hospitals cannot cater for such huge population and specialist circumcision in private hospitals is much expensive. Traditional circumcision is accountable for majority of complications all over the world [9].

Our study comprised of post circumcision bleeding that was of such magnitude that patients were referred to the tertiary care hospital. The study has focused only on bleeding which is usually described along with other complications in most of the studies [3,10,11] but no other study has taken it as its main "cause variable" to the best of author's knowledge.

In our study, 100% of patients presented with bleeding due to injury to penile tissues. Out of them, 23% (n = 29) patients required admission due to hypovolemic shock secondary to blood loss and blood transfusion was given in these. This number is much higher than national [5,12,13] and international studies [14,15]. The reason for this observation probably was time wasted initially in finding the circumciser (who usually has closed his clinic/shop), then stay at one or more hospital emergencies before being referred to us. Neonates and infants can lose significant blood in short period because they have small total blood volume. Moreover, some of the patients came from other cities and blood was lost during transit.

Our study showed that 53.2% of the circumcisions were performed by doctors which is comparable to a large data of 600 patients from a national study [9]. This observation needs particular attention because if most of the bleeding complications are being caused by doctors, then there is something terribly wrong with their training. Another reason could be the same environment in which they are doing circumcisions as the shops of barbers or jarrahs in terms of asepsis, proper light and instruments. Although doctors comprised more than 50% of the circumcisers, the penile injury was of less magnitude to cause admission and transfusions than paramedics and nonmedical circumcisers. This observation is supported in studies from USA, Peshawar and Baghdad as well [13-15]. In our study, one complete glans amputation and five glans injuries were noted, five of which were done by paramedic and non-medical circumcisers (Figure 1).

Fifty percent (50%) of the blood and/or blood product transfusions were given in patients circumcised by paramedics, again highlighting the magnitude and impact of injury.

Coming to methods, it was noted that "bone cutter" was commonest device used (42.1%) and was responsible for most severe complications including glans amputation. It was associated with 11 (8%) admissions and 13 (10.3%) transfusions. Bone cutter has been recognized as a major cause of complications and is widely used by paramedics and non-medical persons in Pakistan [10,12,16-18]. Plastibell circumcision is considered safe and complications are expected when its technical details are not followed [18]. In our study, majority of



**Figure 1:** Partial and complete glans injuries caused by paramedics (upper half) and bleeding related to stuck and displaced plastibell (lower half).

bleeding resulting from plastibell were due to tear of frenulum. In all cases plastibell was removed and suturing/bipolar cautery done. Another significant observation was plastibell applied beyond infancy in 15 patients older than 1.5 years which resulted in severe edema, hematoma collection and delayed separation. The complications from plastibell can be minimized by following guidelines present in literature [19,20].

The free hand and clamp methods were mostly utilized by non-medical personnel and bleeding was mainly due to no application of sutures.

To reduce circumcision related complications, the suggestions include formal training for everyone who wants to do circumcision including doctors, prompt and swift referral if bleeding cannot be controlled at primary or secondary care facility and applying appropriate method of circumcision according to age of boy. Complications are always better to prevent than to treat.

Our study is a descriptive cross-sectional series and it has provided with important associations between age, weight, circumciser and method of circumcision with respect to penile injury, hospitalization, need for transfusion and surgery. However, type of association or cause and effect relationship couldn't be determined as there is no comparison arm.

## Conclusion

Post circumcision bleeding is a serious complication and is a result of injury to penile tissues or failure to secure bleeding vessels. It was associated with 23% hospital admissions and blood transfusions in our study. Circumcisions by barbers and quacks should be discouraged as they are untrained in this respect, instead it should be performed by an experienced individual who can evaluate the patient pre-operatively and identify contraindications to the procedure, manage common complications and evaluate patients post-operatively.

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