

## Comparison of Post Circumcision Complications of Conventional Open Technique Versus Plastibell Method

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### ABSTRACT

**Objective:** To compare outcome of circumcision done by Plastibell versus conventional open method in terms of post op complications, operating time and cosmetic acceptance.

**Study Design:** Comparative prospective study.

**Duration and Place of Study:** Department of General Surgery, Combined Military Hospital, Peshawar Pakistan, from Sep 2019 to Mar 2020 over period of six months.

**Methodology:** All patients (n=100) fulfilling inclusion criteria were randomly divided into two groups. Group-A (n=50) underwent Open Conventional technique while Group-B (n=50) underwent Plastibell technique. To measure outcome of surgery, bleeding rate, cosmetic appearance and post-operative infection were used as parameters. The mean operating time was also compared among both techniques.

**Results:** In Group-A, the average operating time was 24.24±4.36 minutes whereas in Group-B it was 13.38±2.66 minutes (highly significant,  $p$ -value=0.0001). The bleeding rate was 14% in Group-A and 2% in Group-B (Not insignificant  $p$ -value=0.027). Infection rate was 4% in each group (highly insignificant). In Group-A, 47 out of 50 circumcisions had acceptable cosmesis as opposed to 48 circumcisions in Group-B, ( $p$ -value=0.646, insignificant).

**Conclusion:** We conclude that circumcision by Plastibell technique is relatively easy technically and quick to learn. It can be performed quickly and hence parents anxiety associated with prolonged operative time is less. It also has fewer complications as compared to open technique most important being bleeding which can be devastating in children considering their less hemodynamic reserves as compared to adults.

**Keywords:** Circumcision, Complications, Open method, Plastibell method, Techniques.

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### INTRODUCTION

Muslims generally undergo circumcision.<sup>1</sup> Owing to tradition of Prophet PBUH Muslim throughout the world practice it as a religious obligation.<sup>2</sup> The percentage of children circumscribed during childhood differs significantly by state, by religious conviction and to some degree by socioeconomic class.<sup>3</sup> In our country circumcision is performed by barbers, medical technicians, quacks and doctors including pediatric surgeons.<sup>1,4</sup> The best age group to undergo this procedure and the method of circumcision is still debatable.<sup>1</sup>

There are various types of surgical techniques for circumcision.<sup>5</sup> Two of these under discussion here are the conventional open method and the Plastibell method. Every surgical procedure has its own complications. Circumcision being a surgical procedure

carries its own complications. Complication rate ranges from 0.006% to as high as 55%.<sup>3</sup>

Bleeding is a major complication in any surgery, including circumcision.<sup>7,8</sup> Meatal stenosis, infection, insufficient removal of foreskin, and painful scarring, urethral and penile injury are the other possible complications.<sup>2,6,9</sup>

### METHODOLOGY

The Comparative prospective study was performed at Department of Surgery in Combined Military Hospital, Peshawar Pakistan, from September 2019 to March 2020 over a period of six months.

**Inclusion Criteria:** Children of age ranging from 3 weeks to 1-year age were included.

**Exclusion Criteria:** Children with chordae, congenital hypospadias, micro phallus, large hydrocele or hernia and deranged coagulation profile were excluded.

All patients were selected by simple random sampling. Simple random sampling is a sampling

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technique where every item in the population has an even chance and likelihood of being selected in the sample. Here the selection of items entirely depends on luck or probability. Prior permission from hospital ethical committee was obtained.

By lottery method patients were randomly placed into two equal groups, using single blind technique (Group-A, n=50) who underwent circumcision by conventional method while plastibell method of circumcision was used in (Group-B, n=50).

Procedure was performed with aseptic technique under local anesthesia after obtaining written informed consent from each patient parents. Complete blood count, bleeding time and clotting time were done for all patients. Post-operatively patients were advised analgesics and antibiotics for three days along with sitz bath. All patients were followed for bleeding, any sign of infection and cosmesis.

Patient's demographic data including operative time and post-operative complications were recorded. Data was analyzed by SPSS version 15. Descriptive statistics were used to calculate mean and standard deviation for numeric variables i.e. age and operative time. Frequency and percentages were calculated for qualitative variables i.e. bleeding, cosmetic appearance and infection. By using chi square test as a test of significance complications were compared. Independent sample t-test was used as a test of significance to compare operative time in open conventional technique and Plastibell method.  $p \leq 0.05$  was taken as significant.

## RESULTS

Total of 100 patients who underwent circumcision were equally assigned to one of the two treatment group. Patient's age ranged from 21 days to 1 year with mean age  $2.24 \pm 1.098$  months in Groups-A as compared to  $3.33 \pm 2.50$  months in Group-B. The average operating time was  $24.24 \pm 4.36$  minutes in Group-A and  $13.38 \pm 2.66$  minutes in Group-B ( $p=0.0001$ ).

About of 7(87.5%) children from Group-A and 1(12.5%) from Group-B developed bleeding. In Group-A proportion of bleeding was 14% while it was only 2% in Group-B ( $p=0.27$ ). In each group 2 children developed wound infection, with infection rate 4% in each group ( $p=1.00$ ). In Group-A 47(94%) out of 50 were cosmetically acceptable as compared to 48(96%) in Group-B ( $p=0.646$ ). Patient age and operative time is shown in Table-I while post-operative complications in Table-II.

**Table-I: Patient Mean Age and Mean Operative Time (n=100)**

Variables	Group-A (Mean±SD)	Group-B (Mean±SD)
Age (months)	2.24±1.098	3.33±2.50
Operative Time (min)	24.24±4.36	13.38±2.66

**Table-II: Post-operative Complications(n=100)**

Variables	Group A (n=50)	Group B (n=50)	p-value
<b>Bleeding (n%)</b>			
Yes	7(14%)	1(2%)	0.027
No	43(86%)	49(98%)	
<b>Infection (n%)</b>			
Yes	2(4%)	2(4%)	1.00
No	48(96%)	48(96%)	
<b>Cosmetic Acceptance (n%)</b>			
Yes	48(96%)	47(94%)	0.646
No	2(4%)	3(6%)	

## DISCUSSION

Neonatal circumcision is a routine practice with no major adverse outcome.<sup>10</sup> In our set up circumcision is carried out either by conventional open method or Plastibell technique. Bone cutter technique once popular, is discouraged now a days because of the dangerous complication of glans amputation. Overall religious conviction, ethos and cultural rites are the key contributing factor for circumcision.<sup>11,12</sup> Religion is the main driving factor for circumcision in our set up.

Different studies show different complication rates ranging from 0.19% and 3.1%.<sup>13</sup> Linus *et al.* reported a complication rate of 20.2% in his one of the retrospective analysis.<sup>13</sup> While Mak *et al* on the other hand reported complication rate of 17.6% in his randomized trials of childhood subjects.<sup>14</sup> Our study was focused to compare the complications associated with the two procedure i.e. conventional open technique and Plastibell as well as the operating time. By simple random sampling 100 children included in study were divided into two equal groups i.e., Group-A and Group-B. The children of Group-A underwent conventional open method of circumcision and children of Group-B underwent Plastibell method of circumcision. The circumcisions were done by the same surgeon. After the procedure the children were followed for four weeks. Predesigned proforma was used for data collection.

Studies have proved that circumcision with Plastibell Device is an easy procedure with rare complications like including bleeding, cosmetic outcome, sepsis, meatal scarring, localized infection, sepsis, metal scarring. However, in many other studies complications such as traumatic amputation of the

glans and urethra - cutaneous fistula has been reported with conventional open method.<sup>15,16</sup>

The mean age of children in Group-A was 2.24±1.098 months. The mean age in Group-B was 3.34±2.52 months. The average operating time of conventional open technique was 24.24±4.36 minutes and the average operating time in Plastibell group was 13.38±2.66 minutes. A highly significant *p*-value of 0.0001 was noted. The difference is due to simplicity of Plastibell procedure as no stitches are applied at the end of the procedure. The obvious conclusion that can be drawn from this study is that Plastibell technique is less time consuming. Similar results are mentioned in a research article by Mousavi from Iran in 2008. His procedure time for Plastibell technique was on the average 3.4 minutes verses 9.2 minutes for sleeve resection.<sup>17</sup> This difference in time of procedure between his study and our study could be because; all the circumcisions in his study were performed by a pediatric surgeon. Fraser also concluded that Plastibell technique is comparatively less time consuming.

In whole study group 8(100%) children developed minor bleeding after the procedure, 7(87.5%) were from Group-A and 1(12.5%) from Group-B. In Group-A bleeding rate was 14% as compared to 2% in Group-B. The difference was substantial between the two groups (*p*=0.027). Fraser *et al.* showed a bleeding rate of 9% in Plastibell method while 33% in conventional open technique. The reported rate of bleeding varies from 0.1% up to 35% in different studies. Another deadly complication of any surgical procedure is wound infection. Two children in each group developed wound infection which responded well to local wound care and systemic antibiotics. The rate of infection in both groups was 4%, which was statistically insignificant (*p*=1). Infection rate reported by Mak *et al.* was (13.7% in Plastibell and 14.9% in open conventional group).

On follow up patients were reexamined and parents were inquired about the cosmetic acceptance of the results with each procedure. 47 parents out of 50 in Group-A were happy with the outcome while 48 parents in Group-B were satisfied with the result. The difference was insignificant (*p*=0.646). Victor reported 96% satisfaction in parents of children undergoing both procedures.

To conclude, Plastibell is more reliable, safe and satisfactory method of circumcision in children compared to other conventional methods. These days circumcision is most commonly performed by

plastibell method. Surgeons in our country practice conventional method for circumcision, however due to ease of procedure and better outcome surgeons are now preferring plastibell technique.

### CONCLUSION

We conclude that circumcision by Plastibell technique is relatively easy technically and quick to learn. It can be performed quickly and hence parents anxiety associated with prolonged operative time is less. It also has fewer complications as compared to open technique most important being bleeding which can be devastating in children considering their less hemodynamic reserves as compared to adults.

**Conflict of Interest:** None.

### Author's Contribution

Following authors have made substantial contributions to the manuscript as under:

SI & RUT: Study design, drafting the manuscript, data interpretation, critical review, approval of the final version to be published.

MM: & WAN: Data acquisition, data analysis, concept, critical review, approval of the final version to be published.

RI & MA: Critical review, data acquisition, drafting the manuscript, approval of the final version to be published.

Authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

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