COMPARISON OF POST CIRCUMCISION COMPLICATIONS AND WOUND HEALING IN INFANTS BY CONVENTIONAL OPEN METHOD AND BONE-CUTTER METHOD

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ABSTRACT

Objective: The objective of this study is to compare the frequency of post circumcision complications like bleeding and infection along with wound healing in infants by conventional open method and the bone-cutter method.

Study Design: Randomized controlled trial.

Place and Duration of Study: Combined Military Hospital and Military Hospital Rawalpindi, from March 2009 to March 2010.

Patients and Methods: A total of 400 patients were included in the study that underwent circumcision. Patients were randomly allotted to either group A in whom the circumcision was done with conventional open technique (n = 200) or to group B, in whom circumcision was done with bone-cutter (n = 200). Patients were followed up in the surgical OPD after 5 days for assessment and earlier in case of any complication. Outcomes were measured by absence or presence of infection, post operative bleeding and cosmetic acceptance by the parents.

Results: Comparison between the two groups showed that the bleeding rate was 8% in group A and 7% in group B (p = 0.704). Infection rate was 6% in group A and 5% in group B (p = 0.661). Delayed wound healing was seen in 4% of circumcisions in group A as opposed to 2% in group B (p = 0.241).

Conclusion: Complication is a part of any surgical procedure. So is the case with circumcision however no significant difference was found between the two procedures in terms of bleeding, infection, trauma to the glans and the cosmetic outcome.

Keywords: Circumcision, Complications, One-cutter method, Open Method, Techniques.

INTRODUCTION

Circumcision is the commonest surgery performed in infants[1]. According to American Academy of Pediatrics, circumcision reduces the risk of UTI of infancy, phimosis, paraphimosis, balanoposthitis and future risk of penile cancer development[2]. In addition, there is evidence that circumcised men have a lower risk of acquiring HIV and human papilloma virus[3]. In the newborn and infant, indications for circumcision include febrile UTI, congenital anomaly predisposing to UTI (i.e. hydronephrosis or VUR), megaprepuce, recurrent balanoposthitis, balanitis xerotica obliterans and secondary phimosis[4]. Contraindications to neonatal circumcision include hypospadias, epispadias, chordee, webbed penis, microphallus, and hidden penis secondary to hydrocele or hernia[4].

As yet there is no consensus for the best age and method for circumcision. There are different kinds of surgical techniques for circumcision. The two most commonly used amongst them are the conventional open method and the bone-cutter method[5]. Circumcision like any other surgical procedure carries a risk of complications. According to studies conducted by Rehman in 2007 and Bazmamoun in 2008 the rate of post circumcision complication was 6% and 13% respectively[6,7]. This variation is largely a result of the many different criteria used to define complications. Complications of circumcision include bleeding, infection, meatal stenosis, and inadequate removal of foreskin, penile injury, urethral injury, and painful scarring[8].

There are only few studies conducted to compare the results of different methods of performing circumcision, either locally or internationally. So out of a number of surgical

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techniques two most commonly used methods in our setup are selected to compare their results in terms of complications such as bleeding, infection along with wound healing. The results of this study will be applied on the patients presenting in Outpatient Department Combined Military Hospital, Rawalpindi as such that the procedure with minimum complication rate and faster healing of the surgical incision site will be adapted as a standard method for all future circumcisions.

PATIENTS AND METHODS

These randomized controlled trials were conducted at Combined Military Hospital and Military Hospital Rawalpindi from March 2009 to March 2010. A total of 400 infants were included in the study. Patients were randomly divided into two equal groups using random numbers table i.e. group A with 200 infants undergoing conventional open method and group B with 200 infants undergoing bone-cutter method of circumcision.

Babies between the ages of 3 weeks to 1 year with permission of parents to participate were included in the study whereas babies with hypospadias, chordee, epispadias, webbed penis, microphallus, hidden penis secondary to a large hydrocele or hernia and deranged bleeding or clotting profile were excluded.

Procedure

After obtaining informed written consent from the patient's parents the genitalia were prepared with a povidone-iodine solution and draped in sterile fashion. A dorsal penile nerve block was applied using 1% xylocaine, with additional anesthetic administered circumferentially about the penile base (maximum 3 ml). In bone clamp circumcision, the prepuce was first fully retracted to expose the coronal sulcus and retained smegma removed. The tip of the prepuce was then grasped with two artery forceps and pulled forward over the glans with light traction. A small size bone clamp was placed obliquely across the prepuce distal to the glans and parallel to the corona and the prepuce then divided immediately distal to the clamp with the knife. Clamp was released and inner layer of prepuce was trimmed accordingly. While in open circumcision, prepuce is separated in the similar manner as described above. Three small artery forceps are applied to the edge of the prepuce, one in the midline ventrally, two (side by side) in the midline dorsally. Prepuce was then slit in mid dorsal line between two dorsally placed artery forceps as for as the corona, taking care not to enter the urethra. The redundant part of the prepuce along with underlying inner layer was removed parallel to the corona. In both methods haemostasis was secured with absorbable 4/0 plain catgut suture with special attention to safeguard the frenular vessel. Dressing was applied to the wound with a thin layer of Vaseline gauze and dry gauze for twenty four hours.

Parents were advised to start sitz baths (luke warm water with few drops of Dettol solution in it) from next morning twice daily for one week and let the dressing be off at its own. syrup calpol (paracetamol) was advised as analgesic in accordance with the age of the child. Patients were followed up in the surgical OPD after 5 days for assessment and earlier in case of any complication.

Outcomes were measured by absence or presence of infection, post operative bleeding and cosmetic acceptance by the parents. In our study bleeding will be considered as present, if the dressing gets soaked enough to be changed or the blood trickles down the operated site. Infection will be noted as present, if definite pus is identified at the operated site or organisms are isolated from the fluid/ tissue of the superficial incision on culture sentivity. Wound healing will be considered satisfactory when granulation tissue is evident from the wound margins and the final appearance is such that the glans is fully exposed and cut edge of prepuce is lying proximal to the coronal sulcus. Normally incisional space is filled with granulation tissue by 5th day. Data had been analyzed using Statistical Package for Social Sciences (SPSS) version 15. The complications i.e. bleeding, infection and cosmetic acceptance. A p value < 0.05 was taken as significant.

RESULTS

The age of the patients varied from 3 weeks to 1 year. Mean age was 2.24 (SD = 1.098) years

in groups A and 3.33 (SD = 2.50) years in group B.

The bleeding rate was 8% in group A and 7% in group B (p = 0.704). Infection rate was 6% in group A and 5% in group B (p = 0.661). A total of 96% of circumcisions in group A had a satisfactory wound healing as opposed to 98% of group B that is 4% of circumcisions in group A revealed delayed wound healing as opposed to 2% of group B (p=0.241). There was insignificant difference in terms of bleeding, infection and wound healing. Both methods proved to be safe and effective techniques with reproducible results. (Table).

Table: Comparison of post operative bleeding, infection and wound healing in two groups.

	Group A	Group B	*p* - value
Bleeding			
Present	16 (8 %)	14 (7%)	0.704
Absent	184 (92%)	186 (93%)	
Infection			
Present	12 (6%)	10 (5%)	0.661
Absent	188 (94%)	190 (95%)	
Satisfactory wound healing			
Present	192 (96%)	196 (98%)	0.241
Absent	8 (4%)	4 (2%)	

DISCUSSION

About one-sixth of the world's men undergo circumcision for religious, or ethnic and medical reasons[8]. In Pakistan, where 97% population is Muslim by religion, every male has to undergo religious circumcision early in his life[9]. Since long, it has been a common practice that circumcision is conducted by barbers under unhygienic conditions and despite obvious contra-indications. With improvement in literacy rate, the number of circumcisions performed by the trained doctors is increasing[10]. It is, therefore, of great importance to identify the best possible method of circumcision with minimum complications and satisfactory cosmetic outcome in our set up. Routine neonatal circumcision is a safe procedure[11]. The two commonly used techniques for circumcision in our set up are conventional open technique and bone-cutter technique. Religion culture and ethnic rites are the major determinants of circumcision overall[12]. In our setup, religion appears to be the only indication for circumcision.

The overall complication rate of the procedure ranges between 0.19% and 3.1% however, in a few studies, it was extremely high[13]. Upon a retrospective study, Linus reported 20.2% complication rate in infants[14]. Comparatively smaller complication rate (17.6%) was reported in other randomized trials of childhood subjects[15].

Bleeding rate was 8% in group A and 7% in group B. There was no significant difference between the bleeding rates of two groups. Mousavi reported bleeding complication only in conventional open technique with rate a of 9%[16]. Fraser reported postoperative bleeding complication in 11% cases of bone-cutter method and in 10% cases of conventional open technique[17]. The reported incidence of bleeding during circumcision in other series varies from 0.1% up to 35%[18].

Wound infection is another feared complication of any surgical procedure. In our study the infection rate was 6% in group A and 5% group B. This is significantly lower than those reported by Mak et al. (13.7% in bone-cutter and 14.9% in dissection group)[19]. Fraser reported 6% infection rate with both techniques which is the same is in our study[20]. Sorensen reported infection rate of 5% with bone-cutter method[21].

Patients were examined on follow up and their post circumcision wound healing was assessed. In group A 96% whereas in group B 98% had satisfactory wound healing. Victor reported 96% satisfactory wound healing rate amongst the infants[22].

Our study conducted at general surgical department, CMH Rawalpindi is in accordance with and its results are comparable to any of the internationally conducted studies. There was insignificant different in terms of bleeding, superficial infection, wound healing and trauma to glans. Both methods proved to be safe and effective techniques with reproducible results but it is important to emphasize that trauma to glans, a well known and catastrophic complication is more common with bone cutter circumcision especially in the hands of an inexperienced operator.

CONCLUSION

Complication is a part of any surgical procedure, so is the case with circumcision. No significant difference was found between the two procedures in terms of bleeding, infection, trauma to the glans and the cosmetic outcome. Both methods proved to be safe and effective techniques with reproducible results.

CONFLICT OF INTEREST

This study has no conflict of interest to declare by any author.

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