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Operative techniques

Bipolar scissors circumcision is a safe, fast, and bloodless procedure in children

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Abstract

Purpose: The aim of this study is to evaluate bipolar scissors circumcision by comparing it with standard freehand scalpel procedure.

Patients and Methods: Data were analyzed from a prospective, randomized study, comparing 2 different surgical techniques for pediatric circumcision: the bipolar diathermy scissors circumcision technique with those of a conventional scalpel technique. A total of 230 pediatric patients younger than 16 years (115 in each arm of the trial) who were undergoing circumcision were reviewed prospectively. Operative time, surgical bleeding, complications, and postoperative morbidity were analyzed. Differences between bipolar scissors circumcision and conventional surgery were compared.

Results: Median blood loss for bipolar circumcision was 0.2 mL (range, 0-0.8 mL) compared with 2.1 mL in the standard group (range, 0.9-4.2 mL) ($P < .001$). Operative time in the bipolar diathermy treated group was significantly decreased compared with conventionally treated patients (10.8 ± 1.2 vs 19.1 ± 2.6 minutes; $P < .01$). Early and late postoperative morbidity were significantly decreased in circumcised patients who underwent the bipolar circumcision technique as compared with those who underwent the conventional approach regardless of the postoperative edema (22 vs 10; $P = .02$).

Conclusions: Bipolar scissors circumcision approach is an effective and safe procedure alternative to the standard scalpel technique in pediatric circumcision with no significant morbidity.

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Phimosis is a generalized condition at birth but often resolves spontaneously during first 3 to 4 years of life. Circumcision has been the traditional treatment for true "nonphysiological" phimosis. Circumcision is one of the oldest and most frequently performed surgical procedures worldwide. It is estimated that more than 20 million boys undergo the operation each year. About 1 in 6 boys and men in the world has been circumcised [1]. Despite the reasons involved for the indication of the procedure, multiple surgical methods have been reported, from the traditional methods reported in the ancient cultures to those using appliances in newborns (Plastibell device, Gomco and Mogen clamps) and the modern conventional scalpel/suture techniques [2-4]. Statistics on complications of circumcision are sparse, but available data suggest that the overall complication rate of this procedure ranges from

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0.2% to 5% [5]. Circumcision using bipolar scissors is a relative new technique. First reported by Marshs and Archer in 1995 [6], very few studies about the use of bipolar diathermy scissors for circumcision have been described [7-9]. To our knowledge, clinical comparative studies between bipolar scissors circumcision and conventional scalpel procedure in boys with true phimosis have not yet been reported. Our study was designed and developed to evaluate the benefits of the use of bipolar diathermy scissors vs the standard scalpel procedure for circumcision in children.

1. Patients and methods

1.1. Study design

This was a prospective, randomized study comparing 2 different surgical techniques for pediatric circumcision. Parents provided informed written consent for participation. Ethical committee of our hospital approved the trial before embarking on the study. This was performed in a university teaching hospital for pediatric surgery. All procedures were carried out in an operating room specially designed for pediatric patients.

1.2. Patients

A total of 230 patients were recruited prospectively for this study between June 2005 and June 2008 at the University Hospital of Santiago de Compostela, Spain. Only boys between 3 and 16 years were included. Patients with bleeding disorders were accepted for recruitment. We do not usually perform routine neonatal circumcision in our country except in particular cases for religious or cultural reasons. Patients were randomized to either the bipolar scissors circumcision or the standard scalpel procedure group using block randomization. The exact method of this randomization was blind to the surgeons involved but accomplished a correct balance of both parts of the trial to ensure equal number of patients in both methods even if the study stopped early. All surgical procedures were carried out by 4 staff pediatric surgeons.

1.3. Surgical procedure

1.3.1. Preparation and anesthesia

All the patients underwent surgery as day cases under sedation complemented by dorsal penile nerve block infiltration. Lidocaine-Prilocaine EMLA cream was applied in the base of the penis 20 minutes before performing dorsal penile nerve block infiltration. Chlorhexidine 2% solution was applied around the penis, and the operative site was covered with a sterile surgical drape. Locoregional anesthesia was done 5 minutes before surgery using bupivacaine 0.25% plain at 10 and 2 o'clock at the base of the penis with a 24-gauge needle.

1.3.2. Circumcision

Standard procedure was performed as usual freehand fashion with scalpel and monopolar electrocautery or suture ligation for hemostasis if necessary. Bipolar scissors circumcision was performed using Ethicon PowerStar bipolar scissors BP100 (Johnson and Johnson, Brussels, Belgium) to remove the foreskin, mucosa, and frenulotomy (Fig. 1). Closure of the wound was realized in both procedures using Vycril rapid 5/0 or 4/0 (polyglactin 910, Ethicon Johnson and Johnson) depending on the size and age of the patient. Bipolar scissors are a modified Metzembaum scissors with 2 blades insulated by a ceramic coat. Handles are covered with plastic. We use bipolar scissors only for 30 surgeries before being discarded because of ceramic coat malfunction. We routinely use in our operating room an "Excalibur Plus PC Electrosurgical Unit" (Conmed Aspen Labs, Englewood, CO), a high-power digital electrosurgical multipurpose monopolar and bipolar generator. We actually use the footswitch bipolar cutting level at 8. In the first cases, we used higher setting levels (12-15) in bipolar coagulation mode, and the postoperative edema was more relevant.

1.3.3. Postoperative management

After surgery, all patients received a topical ointment with corticoid and antibiotics for 1 week twice a day for diminishing edema and to avoid infection. Side effects were closely monitored during the postoperative period, including erythema, hematoma, bleeding, edema, and pain. All children were prescribed a standard regimen of paracetamol used 4 to 6 hourly and were operated on a day case surgery basis. Parents were given pain score charts. Outcome measures used for the study were intraoperative bleeding, surgical time, postoperative pain, swelling, balanitis xerotica obliterans, scar aspect, and reoperations needed. Small quantities of blood loss were quantified using samples in gauze from 0.1 to 3 mL. Follow-up was made in all boys at 3 weeks, at 3 months, and in some cases, at 6 months after surgery.

1.4. Assessments

Sample size was calculated using Statcalc (EpiInfo, Centers for Disease Control and Prevention, Atlanta, GA). All data were analyzed using SPSS software (Statistical Package for Social Sciences for Windows). Univariate analyses of continuous variables were performed using Student t test, Mann-Whitney U test, or analysis of variance whenever appropriate. Pearson χ^2 or Fisher exact test was used for univariate comparisons of categorical variables. Covariates with prognostic value by univariate analysis were entered into a separate multivariate logistic regression model for each end point. Two-sided significance tests were performed in all cases. Multivariate factors with $P < .05$ were considered significant. Data are presented as median ±

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