Circumcision in Bleeding Disorders: Improvement of Our Cost Effective Method with Diathermic Knife

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Purpose: Circumcision is a very common surgical procedure that has been performed for thousands of years. In this paper, we report the long-term results of circumcision performed by using diathermic knife on patients with bleeding diathesis and the amount of blood factors used.

Materials and Methods: A total of 147 patients with bleeding diathesis circumcised under local anesthesia by using diathermic knife between 1996 and 2010 were recruited into this study. Age of the patients, type of the bleeding diathesis and the treatment protocols were recorded. Post-surgical infection and bleeding rates of 2 different factor replacement protocols were recorded.

Results: Mean age of the patients was 11.5 years (range, 1.5-37 years). In the group of protocol 1 applied patients, 3 patients (4%) had bleeding and one patient had infection whereas in group of protocol 2, 4 patients (5.4%) had bleeding. The bleeding cases were taken under control after the factor replacement and elastic bandage.

Conclusion: Whenever it is necessary for an individual to be circumcised for any reason whatsoever, we think that circumcision can be performed in the patients with bleeding diathesis with lower costs and complication rates by using diathermic knife and the protocol that we used.

Keywords: circumcision; male; adverse effects; hemorrhage; prevention & control; electrocoagulation; hemophilia a; complications.

INTRODUCTION

Circumcision is a very common surgical procedure that has been performed for thousands of years. It is performed as a religious obligation in certain societies, as a tradition in some of them and due to medical reasons in the others.[1,2] All people with bleeding diathesis including the hemophilia patients are under the risk of excessive bleeding during and after the surgical interventions. Although the circumcision is a relatively minor surgical intervention, these patients can also have prolonged bleeding even after the circumcision procedure.[3] However, although many parents know this risk, they insist on circumcision due to religious and cultural reasons. The measures taken to perform circumcision in children with bleeding diathesis bring a serious economic burden due to the high cost of factor replacement. It will be more appropriate to perform circumcision to prevent these children from feeling excluded from the society and with lower complication rates and costs. In Turkey, 88% of parents reported that it is not acceptable to be uncircumcised, yet again another study showed that the hemophilic children and their parents have inferiority complex due to being uncircumcised.[4,5]

The methods that increase hemostasis on the wound site reduce the risk of bleeding and diminish the factor requirement but high treatment cost still remains as a problem.[6] We already showed that circumcision can be performed in the patients with bleeding diathesis by using the diathermic knife with relatively lower cost and complication ratios.[4] We have aimed to reduce the cost further by improving our factor replacement protocols for the last 6 years. The purpose of this study is to compare the success, cost and complication rates obtained after circumcisions performed using the diathermic knife in patients with bleeding diathesis by administrating of two different factor replacement protocols. At the same time, we hereby report the long term results of circumcision performed by using the diathermic knife, which is an original technique, with a larger number of patients.

MATERIALS AND METHODS

A total of 147 patients with bleeding diathesis circumcised under local anesthesia by using diathermic knife between 1996 and 2010 were enrolled into this study. Age of the patients, type of the bleeding diathesis and the treatment protocols were recorded. The bleeding and infection rates were recorded after the procedure. If the wound was still bleeding after circumcision and there was a need for an additional intervention, this was defined as "bleeding".

Between 1996 and 2004 the factor replacement was applied according to protocol 1, whereas between 2005 and 2010 the factor replacement was applied according to the protocol 2. All the patients were hospitalized for minimum 4 hours before the procedure and their informed consent for surgery was obtained and the required factor replacement was applied. For the purpose of local anesthesia, 2-4 mL 2% lidocaine hydrochloride was injected around the base of the penis to obtain a ring blockage. Following the necessary cleaning and coverage, the stretched foreskin was aligned to the coronal sulcus and clamped using a personally modified clamp (Figure 1), and then the foreskin on the distal side of the clamp was excised using the diathermic knife developed in our country for bloodless circumcision (Figure 2). The skin and mucosa were sutured with 5-0 absorbable sutures. The antibiotic cream was locally administered, dressing or systematic antibiotic was not administered. The 15 mg/kg/dose of paracetamol was administered orally for analgesic purposes when necessary.

Statistical analysis was performed by the t test using the statistical package for the social science (SPSS Inc, Chicago, Illinois, USA) version 13.0. A P value < .05 was considered statistically significant.

RESULTS

In protocol 1 group the mean age of the 75 patients was 11 years (range, 1.5-25 years), while in protocol 2 group the mean age of 72 patients was 12 years (range, 4.5-37 years) (Table 1). For the patients in whom the factor replacement was administered according to the protocol 1, hospitalization time was 2-3 days and the duration of factor administration was 9-18 days while for patients in group of protocol 2 hospitalization time was 1-2 days and the duration of factor administration was 9-13 days (Table 2). Twenty-four patients requiring surgical intervention for another reason were circumcised using diathermic knife under general anesthesia. Bleeding was observed in 3 (4%) of the patients for whom the protocol 1 was administered, infection was observed in one patient and bleeding was observed in 4 (5.4%) of the patients for whom the protocol 2 was administered. The bleeding cases were taken under control after the factor re-

Table 1. Characteristics of study patients.

Variables	Years 1996-2004 (Period 1)	Years 2005-2010 (Period 2)
Protocol method	1	2
Total patients, no.	75	72
Hemophilia-A	65	57
Hemophilia-B	6	6
von Willebrand disease	1	8
Glanzmann's thrombasthenia	1	-----
Factor VII deficiency	1	-----
Factor XIII deficiency	1	------
Factor V deficiency	-----	1
Age, years-median (range)	11 (1.5-25)	12 (4.5-37)
Body weight, kg-median (range)	30 (9-74)	34 (18-102)

placement and applying elastic bandage. A mild edema was detected on the line of the circumcision in all patients but it spontaneously recovered within 3-4 days. Serious scar tissues were not found in the biopsies taken from the cases following the circumcision performed with the diathermic knife and it was previously demonstrated that it did not have any negative impact on the vessels and nerves.[4] The cost of both protocol are given in Table 3. Statically there is a significant difference between protocol 1 and protocol 2, in which protocol 1 has higher cost ($P < .001$).

Table 2. Factor replacement protocol 1 (between 1996-2004) and protocol 2 (between 2005-2010).

Variables	Severe	Moderate	Mild
Day 1, Preoperative	25	20	20
Postoperative	25	20	20
Days 2-3	40	25	15
Days 4-7	30	20	10***
Days 8-10	20	10*	10 (day 9 only)
Days 12 and 14	15	10	-----
Days 16 and 18	10	-----	
Total	360 U/kg	220 U/kg	120 U/kg

Factor Replacement Protocol 2 (U/kg)*,**

Variables	Severe	Moderate/Mild
Day 1, Preoperative	25	15
Postoperative	15	10
Days 2-7	15	10***
Days 9, 11 and 13	15	10 (day 9 only)
Total	175 U/kg	95 U/kg

* Double doses for Hemophilia B, vasopressin not used.
** Tranexamic acid 25 mg/kg/day for 7 days + 10 mg/kg during surgery.
*** Plus vasopressin 0.3 µg/kg/day for 3 days.

DISCUSSION

The modern hemophilia treatment aims to achieve a full social and cultural integration of the hemophilic child with the society.[7] For this reason, if the hemophilic patients live in a society in which the circumcision has a socio-cultural importance and most importantly if the patient wants to be circum-

Figure 1. The personally modified clamp for the diathermic knife and diathermic knife device.

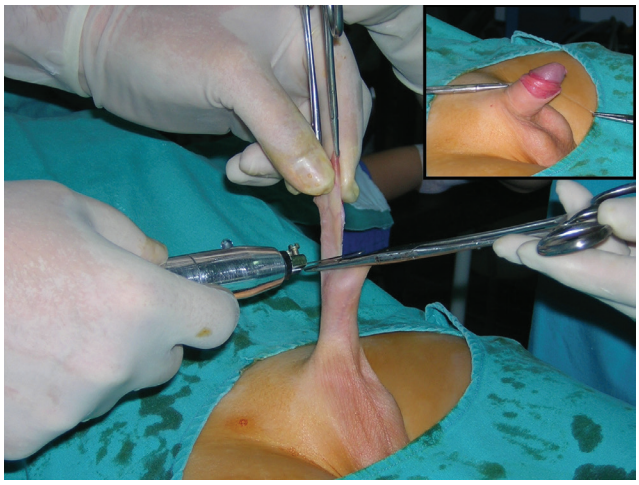

Figure 2. Clamped foreskin and excision with the diathermic knife and after the circumcision (small picture).

Table 3. Total cost (US$) of the circumcision in hemophilia.*

	Protocol 1			Protocol 2		
Variables	**Severe**	**Moderate**	**Mild**	**Severe**	**Moderate**	**Mild**
Concentrate	216/kg	120/kg	72/kg	105/kg	57/kg	57/kg
Other medications	10	10 + 0.3/kg	10 + 0.3/kg	10	10 + 0.3/kg	10 + 0.3/kg
Hospitalization	170	140	140	170	140	140
Total	225/kg	127.8/kg	79.8/kg	114/kg	64.3/kg	64.3/kg

* Total cost includes factor replacement + other medications + hospitalization.

cised, we believe that it should be performed by creating the appropriate conditions.

As the measures are taken for the patient with bleeding diathesis, it is a priority to choose the surgical method that cause less bleeding as much as possible.[4] These methods include bipolar scissors and laser.[8,9] However, information about the use of these methods on the patients with bleeding diathesis is limited. We think that the diathermic knife device that we use as an alternative to the above mentioned methods causes significantly less bleeding. In the first series that we published before, we showed that circumcision can be performed on the patients with bleeding diathesis with minimal complication rates by using diathermic knife.[4] The findings of our study shows that the diathermic knife is reliable in long term and can be used with the updated factor replacement protocol with a lower cost and approximately the same complication rates.

The other measures that can be taken for the patients with bleeding diathesis include the factor replacement, 1-deamino-8-D-arginine vasopressin (DDAVP) infusion, fibrinolysis inhibitors, local fibrin glue application, and the use of ankaferd blood stopper.[7,10] Some authors claimed that the local fibrin glue application is a reliable and inexpensive solution for the hemophilic patients.[5,11] Avanoğlu and colleagues reported that they reduce the cost of circumcision by using the fibrin glue on the hemophilic patients.[6] However, the cost they reported is much higher than the cost we found in our study for both protocols. Even though we did not use any agents to prevent local bleeding following the circumcision, the bleeding rates are tremendously low. This indicates the reliability of our method. The use of the classic electrocautery on penis is avoided as an undesired damage may occur on the penis as a result of uncontrolled transmission of electric current.[12] However, our device is not an electrocautery and the electric current is not conducted to the tissue. As a matter of fact, only a limited damage on the tissue was demonstrated in the histopathology test.[4]

The positive results of the patients, who got circumcised by protocol 1, encouraged us to reduce factor levels. Protocol 2 was created after consultation with hematology. Whenever it is necessary for an individual to be circumcised for any reason whatsoever, we think that circumcision can be performed in the patients who have bleeding diathesis with low costs and complication rates by using diathermic knife and protocol 2 that we applied. Still there is no need to rush for performing circumcision and when there is an obligation for another surgical procedure performing circumcision at the same session with this surgery seems to be a more economic and less morbid way. Also, to avoid the development of inhibitors due to factor usage which can be a problem for such a surgical intervention, it is appropriate to delay circumcision after 12 months of life.[13]

The limitations of our study are wide range of patient's ages and not all procedures were made by the same surgeon. Also the cost factor differs from one country to another.

CONCLUSION

In our study we found that the cost of protocol 1 is higher than protocol 2. This situation shows us, the cost of the circumcisions performed with the "diathermic knife" in the patients with bleeding diathesis is lower.

CONFLICTS OF INTEREST

None declared.

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