

CIRCUMCISION IN HEMOPHILIA

AN OVERVIEW

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Circumcision in Hemophilia: An Overview

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Introduction

The World Health Organization describes health as being “not only physically healthy, but to be also psychologically and socially healthy”. Therefore, when dealing with the health issues of people with hemophilia, medical professionals should address not only the physical, but also the psychosocial aspects of their care. The ultimate aim of modern treatment of hemophilia is to integrate people with hemophilia socially and culturally into society (1). Such an approach is vital when considering issues related to circumcision in people with hemophilia.

The Status and Importance of Circumcision in Various Societies

Religious and cultural aspects

In some societies, circumcision is entirely a religious rite whereas in others, it may be a traditional or a cultural practice. Circumcision is mandatory in Jews (2,3). It is stated explicitly in the Old Testament that Prophet Abraham and his successors will be circumcised (Gen. 17:10-14).

In Islam, circumcision is performed only to conform to the practice of the Prophet Mohammad and is not a religious necessity. Even in the sayings of Prophet Mohammad, the references date back to the practice of Prophet Abraham (4). Over time, circumcision has become an important tradition in the sociocultural life of Moslems and is practised by almost all of Moslem society.

In some societies, such as those in Africa, circumcision is a local tradition or cultural practice. Nigeria is a good example of such a society (5).

Patient and family perspective

In societies where circumcision is a religious, social or cultural practice, people with hemophilia and their families view being

uncircumcised as socially unacceptable. For example, in Turkey, circumcision is considered “the first step toward being a man” and a sign of becoming a member of society (6,7). The situation is not different in other countries with a tradition of circumcision. In these societies, an uncircumcised boy cannot view himself as a “man” and suffers severe psychosocial problems. His family also feels this social pressure very strongly. Being unable to be circumcised results in an inferiority complex both in the person with hemophilia and his family. In a survey by Kavakli et al. of 105 people with hemophilia and their families, 94% of the families wanted their children to be circumcised, and 60% of the boys and 82% of the families reported an inferiority complex for this reason (7). Loutfi et al. stated similar reasons in their study and concluded that in order to satisfy the religious and social beliefs of people with hemophilia and their families, the risks and costs of circumcision should be accepted (8).

Medical Reasons for Circumcision

In countries where circumcision is not a traditional practice, the main reasons for the procedure are medical. Although there have been debates on the medical benefits of circumcision, it is almost certain that it has many advantages.

In circumcised males, the rate of sexually transmitted diseases (STDs), including HIV, is significantly lower. The risk of developing cancer of the penis is almost zero in circumcised males. Similarly, the risk of cervical cancer in partners of circumcised males is extremely low, as is evident in Jewish and Moslem communities. Circumcision also reduces or prevents problems related to the foreskin, such as phimosis, paraphimosis, or balanitis (5,9).

Early circumcision significantly decreases the risk of urinary tract infections in boys. The rate of urinary infections in uncircumcised boys is 10 times higher than that of the circumcised boys (10,11).

Balancing “Social Desire” and “Risk and Cost”

In developing countries, people with hemophilia face many problems. Lack of adequate factor supply as well as surgical procedures without proper precautions threaten the life of people with hemophilia. A survey conducted in Turkey found that one in every three families with hemophilia had experienced a death related to circumcision (12). It has been reported that, especially in developing countries, perioperative hemorrhages may be fatal. In a study reported from Nigeria, postcircumcision hemorrhage was observed in 52% of people with hemophilia (5). In a published review of the literature, it was stated that there are 101 published reports of bleeding from circumcision of newborns (13).

One of the main obstacles to circumcision of people with hemophilia is the high cost of the operation which may be as much as US\$10,000, mainly because of the cost of clotting factors. In a developing country with limited resources, it is almost impossible for parents to have their sons circumcised if they do not have insurance coverage (14). However, in spite of high costs, there is a huge social demand for the circumcision of boys with hemophilia (1,8). This demand is so strong that most families will risk their children’s lives by having them circumcised without taking the necessary precautions.

In short, we need an optimal approach to address the social demand for circumcision of people with hemophilia, in spite of the risks and costs. People with hemophilia in developing countries have many problems and view themselves as being handicapped all their lives. It should be the responsibility of healthcare professionals not to expose these boys to an additional psychosocial problem resulting from not being circumcised.

Suggested Measures for the Circumcision of People with Hemophilia

Circumcision of people with hemophilia should not be considered as a minor procedure and should not be performed without taking adequate precautions. Before operating on a patient with hemophilia, all necessary

laboratory tests should be done to confirm the factor deficiency, level of factor and presence of inhibitors. Informed consent should be obtained from the family. The insurance company should be notified and necessary blood products (factor concentrates, packed red blood cells, fresh frozen plasma, etc.) and other medications (tranexamic acid, DDAVP, analgesics, antibiotics, etc.) should be obtained beforehand.

Increasing local hemostasis in the surgical wound may decrease the risk of postoperative bleeding. The general risk of postoperative bleeding in people with hemophilia is about 15-20%. Therefore, in any surgical procedure, including circumcision, adequate precautions should be taken.

Systemic and local measures to prevent bleeding include:

- Factor replacement (1,15,16)
- Desmopressin (DDAVP) (1,15,16)
- Inhibitors of fibrinolysis (8,16,22)
 - Tranexamic acid
 - Epsilonaminocaproic acid (EACA)
- Fibrin glue (local application) (17,18)
- Laser surgery (19,20)
- Meticulous surgical technique and hemostasis (8)

Application of fibrin glue, which reduces the amount of factor used and hence the costs, may be considered safe. Martinowitz et al. used fibrin glue in circumcision in 1992 (18). Avanoglu et al. combined fibrin glue with continuous factor infusion for 48 hours and reduced the duration of factor replacement therapy and costs (17,21).

Turkish Method for Circumcision of People with Hemophilia

In Turkey, we have developed a new technique for circumcision of people with hemophilia. For the last six years, we have used a bloodless circumcision technique, which we call the Turkish method, that reduces the amount of factor needed by half. Our goal was to develop a safe, practical, acceptable and comfortable method for both the patient and his family. This approach minimizes the two main obstacles to circumcision, namely the risk and the cost. With this technique, we have circumcised 56 patients with hemophilia A, hemophilia B, factor VII deficiency, factor XIII deficiency, Glanzmann

thrombasthenia, and von Willebrand disease (vWD). The factor replacement program used during the operations is described below. Another 16 patients were circumcised during major surgery under general anesthesia. In these cases, the foreskin was cut surgically and sutures were placed afterwards. The preparation phase was similar in these cases; however the factor replacement program was designed according to the primary surgical procedure.

The ages of the patients circumcised using the Turkish method ranged between 1.5 and 25 years, with a median age of 11. Median body weight was 30 (10-74) kg. Severity of the disease was mild in 10 cases, moderate in 15, and severe in 29. Another two had Glanzmann thrombasthenia and factor XIII deficiency (one each).

Before the operation, tests were done on each patient to determine complete blood counts, factor levels, and presence of inhibitors. Then a hemostasis plan was designed. Necessary medicines such as factors, tranexamic acid, DDAVP, and creams were supplied. All patients were hospitalized on the day of circumcision four hours prior to surgery.

The Turkish method is performed as follows: After starting reduced dose factor substitution, circumcision is carried out under local anesthesia with 2-4 ml of 2% lidocaine HCl using ring block method at the base of the penis. After the genital area has been scrubbed and prepared, the foreskin is stretched distally with two straight clamps in the 6 o'clock and 12 o'clock position (Figure 1).

A modified straight clamp, similar to the Mogen clamp (Figure 2), is applied distally to the glans penis by pushing the glans back with thumb and index finger to avoid inadvertent glandular damage (Shield technique).

The clamped foreskin is crushed and squeezed (pressed) between two jaws of the modified Mogen clamp (Figure 3). Excess foreskin is excised using a special thermocautery device (diathermic knife) designed and manufactured in Turkey for bloodless circumcision. The cutting electrode of the device is simply applied parallel to the distal surface of the modified Mogen clamp after activation. The excision takes no longer than 10 seconds (Figures 4 and 5).



Figure 1: Stretched penile skin



Figure 2: Personally modified Mogen clamp



Figure 3: Clamping the foreskin



Figure 4: Beginning excision of the foreskin

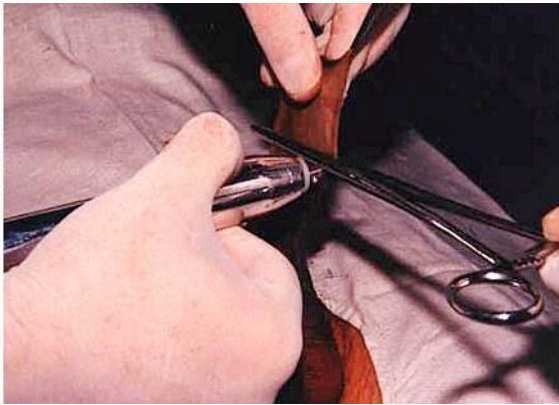


Figure 5: Excision in progress

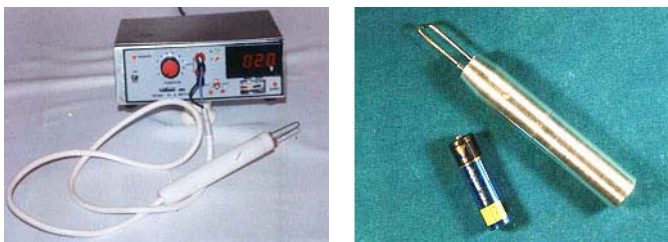


Figure 6: Diathermic knife (AC and DC operated)



Figure 7: Completed excision with no bleeding



Figure 8: Final appearance of circumcised penis

AC (power supply) and DC (rechargeable battery) versions of the diathermic knife are available, the latter being our preference (Figure 6).

Following completion of foreskin excision, no bleeding is seen in the surgical field (Figure 7).

The edges of the remaining skin and mucosa are approximated with frequent 5/0 interrupted plain catgut sutures (Figure 8).

Antibiotic ointment is applied to the wound.

No dressing is necessary.

The protocol for reduced dose factor substitution is as follows:

- Oral tranexamic acid 25-30 mg/kg/day for seven days, beginning 12 hours prior to surgery.
- 20 U/kg (25 U/kg for severe cases) factor injection, IV bolus, two hours prior to surgery. Double doses are used for hemophilia B.
- 10 mg/kg tranexamic acid (or 0.3 mcg/kg DDAVP infusion for mild cases) during surgery.
- Eight and 16 hours after surgery, 10 U/kg (12.5 U/kg for severe cases) factor is infused.
- On the second and third days, factor is infused at a dose of 15 U/kg/day bid for mild, 25 U/kg/day tid for moderate, and 40 U/kg/day qid for severe cases; an additional dose of DDAVP is infused in mild cases. In hemophilia B cases, double doses of factor are used twice, but DDAVP is not used.
- In severe cases: factor is used at a dose of 30 U/kg/day tid on the fourth to seventh days; 20 U/kg/day bid on the eighth to tenth days; 15 U/kg/day single dose on the eleventh to fourteenth days and 10 U/kg/day every other day thereafter for a total of 1-4 times. In hemophilia B cases, double doses are given twice on the fourth to seventh days; once on the eighth to fourteenth days, and every other day thereafter.
- In moderate cases: factor is infused at a dose of 20 U/kg/day tid on the fourth to seventh days, 10 U/kg/day bid and one dose of DDAVP on the eighth to tenth days; and

10 U/kg/day factor infusion every other day for 1-2 times.

- In mild cases: factors are infused at a dose of 15 U/kg/day tid on the fourth day; 10 U/kg/day bid and one dose of DDAVP on the fifth to seventh days; and 10 U/kg/day factor infusion thereafter every other day once or twice.
- In congenital factor VII deficiency: FEIBA (aPCC) is used as follows: First day: 30 U/kg/day qid; second to fourth days: 20 U/kg/day tid; fifth day: 15 U/kg/day bid; sixth to seventh days: 7.5 U/kg/day. Tranexamic acid is used as described above.
- In congenital factor XIII deficiency: 1 unit of fresh frozen plasma (FFP) is given 12 hours prior to the operation and during the operation. On the second, fourth, sixth, and ninth days after the operation, 1 unit of FFP is given.
- In Glanzmann thrombasthenia: Tranexamic acid is given in doses as explained above. In addition to this, 4 units of platelets are infused 12 hours and four hours prior to the operation. Thirty-six hours after the operation, 8 units of platelets are infused.
- In vWD, the protocol designed for mild hemophilia cases is used.

As a result, in 56 people with hemophilia circumcised using local anesthesia and a thermocautery, the hospitalization period varied from two to five days while the duration of factor replacement therapy was seven to 18 days.

No significant bleeding or wound infection occurred. Only five patients had transient minimal bleeding because of delay in factor supply, and responded quickly to factor administration. One of them needed sutures. Hematoma on the ventral aspect of the wound at the frenular junction was seen in one case on the ninth postoperative day and was treated successfully with cleaning, pressure bandage, and factor injection. Mild to moderate edema and hyperemia seen along the suture line in almost all cases lasted for three to five days. No other complications were encountered.

Several biopsies taken from the excision line to evaluate the histological effect of the diathermic knife on penile tissue revealed the same diathermal effect in character and depth as a

laser incision. There was no harmful effect on deep tissues, vessels, or nerves.

The period of complete wound healing varied from seven to 21 days. The patients returned to their routine daily life within a week. Excellent patient and family satisfaction was reported.

With this method, average consumption of factor products for severe hemophilia is 395 U/kg (range: 300-480); for moderate hemophilia, 215 U/kg (range: 178-295); for mild hemophilia and vWD, 125 U/kg (range: 95-175). In congenital factor VII deficiency, 125 U/kg FEIBA was used (total: 8500 U). In Glanzmann thrombasthenia, 16 units of platelets were used. In Turkey, although it may change over time, the insurance companies pay US\$0.60/U for factor concentrates. In addition to factor concentrates, tranexamic acid, and other surgical materials were used during the operation. In moderate and mild hemophilia and in vWD, 3-6 doses of DDAVP were used. Altogether, the average cost of the operation (drugs and hospital expenses) was US\$102/kg for mild hemophilia, \$149/kg for moderate hemophilia and US\$247/kg for severe hemophilia. The most important determinant of the total cost is the cost of the clotting factor.

The people with hemophilia who were circumcised at the same time as they were operated on for another reason had general anesthesia and were hospitalized for a median of 10 days (range: 5-22 days). They had used more factor due to their primary problem, therefore no bleedings were observed at the circumcision site in these 16 patients. Wound healing began after the fifth day. The patients were started on a physiotherapy program on the fourth day because of their primary problem. The circumcision procedure did not hinder the management of their other problems. Factor consumption was 550 U/kg (range: 500-590) for severe hemophilia and 405 U/kg (range 360-480) for moderate and mild hemophilia. The total cost of these procedures could not be calculated because everyone had a different operation.

Comparison of Techniques

As it is evident from our study, an open surgical approach consisting of "meticulous surgical

technique + scrupulous hemostasis + factor replacement" for the circumcision of people with hemophilia is not economical due to the large amount of factor needed. DDAVP and inhibitors of fibrinolysis are not powerful enough to stop bleeding and they should be combined with other agents.

Using a carbondioxide laser may decrease bleeding and factor consumption, but the high cost and the laser's unavailability in developing countries preclude its usage for the circumcision of people with hemophilia.

Studies have reported that local use of fibrin glue is a safe and cost-effective method for treating patients with hemorrhagic disease for minor surgical procedures, including circumcision (17,18). In our study, the method we used for circumcision has proven to be safe, effective, and cheaper than local application of fibrin glue in hemophilic boys. In addition, this practical and quick procedure can be done under local anesthesia, avoiding the additional risk of general anesthesia. Avanoğlu et al. reported the average cost of factor replacement was US\$366/kg/case in a group of patients with moderate and severe hemophilia circumcised using fibrin glue and US\$472/kg/case in the control group, while the average cost was US\$149/kg/case for patients with moderate hemophilia and US\$247/kg/case for those with severe hemophilia in our study (17).

The technique we have used is safe, reliable, practical, cost-effective, and well accepted by people with hemophilia and their families.

Suggestions for Economical Circumcision of People With Hemophilia

The following are suggestions for the Turkish method in particular and for circumcision in general to make circumcision more economical for people with hemophilia:

- If circumcision is an elective procedure and the patient is going to have dental therapy, orthopedic intervention, or surgery where factor replacement is inevitable, the circumcision can be done at the same time. This saves factor and reduces fear.

- People with hemophilia can be circumcised as newborns, when the body weight is less. This reduces the amount of factor used, and hence the cost. However, since the risk of developing inhibitors against the factors is high during the neonatal period, postponing circumcision after the 6th month of age is preferred and 6-18 months are deemed a better period for circumcision.
- If the cost of the clotting factor can be reduced, the total cost will decrease significantly.

Conclusion

For those who want it, circumcision is very important for improving not only the physical but also the psychological and social health of people with hemophilia. In societies where it is deemed necessary, performing circumcision by experienced medical staff under optimal conditions will prevent negative outcomes (5,7).

In societies which consider circumcision a religious, sociocultural, or psychological obligation, there is no doubt that the procedure should be done if a person with hemophilia wants to be circumcised. In our opinion, circumcision of people with hemophilia can be done safely using our method and equipment. Bloodless circumcision with a diathermic knife using the Turkish method is a reliable and practical surgical alternative for boys with hemophilia (22).

In conclusion, in societies where circumcision is a part of the culture, awareness of the patients, their families, and the healthcare professionals will render circumcision of people with hemophilia a safe procedure.

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