

The Management of Phimosis Seen After Circumcision with Thermocautery

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Purpose: One of the most frequent complications after circumcision by thermocautery is phimosis. In this study, we aimed to present the functional and cosmetic results of the modified sleeve technique for the correction of this iatrogenic phimosis.

Materials and Methods: The study group included iatrogenic phimosis cases who underwent circumcision using thermocautery during the last eight years. Initially, steroid creams were applied on these patients for six weeks. Patients who did not respond to this treatment underwent surgery using the modified sleeve technique. Control visits were performed at the first and fourth postoperative weeks.

Results: A total of 32 patients with a median age of 5.1 ± 1.1 years out of 13285 circumcisions by thermocautery were included in the study. No positive treatment outcomes were obtained by topical steroids, and all patients proceeded to surgery by modified sleeve technique. Median operative time was 25 ± 2.3 minutes. Cosmetic and functional outcomes were satisfactory in all cases.

Conclusion: There is no place for topical steroids in management of iatrogenic phimosis after thermocautery, thus early surgery is advised to avoid emotional stress. Our modified sleeve technique can achieve maximum cosmetic and functional outcomes without leading to extreme shortening of the penile skin and mucosa.

Keywords: cautery; circumcision; modified sleeve; phimosis

INTRODUCTION

Circumcision is the surgical excision and removal of the foreskin to expose glans penis.⁽¹⁾ It is one of the most common surgical procedures throughout the world. One of the most important complications of circumcision is the development of phimosis. Especially when thermocautery is used during circumcision, this risk of phimosis significantly increases.⁽²⁾ By definition, a hard fibrotic ring develops during phimosis that entraps the penis. In some cases, glans penis or external meatus is almost indiscernible. This condition usually leads to development of infections, and occasionally causes voiding problems and may even progress to infravesical obstruction. When response is not achieved with application of steroid creams, phimosis is surgically corrected. Since the fibrotic ring is much harder in these iatrogenic cases than that seen with congenital phimosis, even under general anesthesia, forceful retraction of the foreskin cannot expose glans penis.

The classical dorsal slit technique for the management of phimosis may result in excessive tissue loss in circumcision associated cases. Particularly, an inexperienced surgeon may try to expose the glans by a dorsal slit, which may increase tissue loss when an inadequate length of penile skin remained from the original circumcision.

In our study, we modified the sleeve technique to man-

age such iatrogenic phimosis. Our aim was to provide maximum functional and cosmetic outcomes without unnecessary tissue loss of penile skin and mucosa by this technique. The objective of this study was to define the outcome of our modified sleeve technique for the management of phimosis related to circumcision by thermocautery.

MATERIALS AND METHODS

Study population

A total of 13285 circumcisions were performed at our institution between September 2009 and September 2017. Among them, 48 iatrogenic phimoses developed. However, 16 of these were treated by another physician and were excluded from the study. A total of 32 patients who were surgically treated in our institution for phimosis secondary to circumcision with thermocautery were included. Phimosis was graded based on the classification by Kikiros et al., described for patients with congenital phimosis.⁽³⁾

Before surgical intervention, topical application of clobetasol propionate (0.05%) cream was tried twice daily for a period of six weeks. When corticosteroid therapy failed, surgical revision was recommended to the patients. The characteristics of the patients are summarized in **Table 1**. At all stages of the study, the families were informed about the procedure, and their

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Table 1. The characteristics of the patients

Number (%)	
Total number of the circumcision	13285
The number of iatrogenic phimosis	48 (0.36%)
The number of surgically treated phimosis cases (study group)	32 (0.24%) 1 –8 years (mean 5.1±1.1 years)
Age range of phimosis underwent surgical correction	
The severity of phimosis*	
Grade 5	20 (0.15%)
Grade 4	12 (0.09%)

* According to Kikiros et al.

informed consent forms were obtained. This study was carried out in accordance with the Helsinki Declaration. Approval for conducting the study was granted by our Institutional Ethics Committee (Register No: 2018/15-30).

Surgical technique

All interventions were performed in the operating room under general anesthesia by the same urologist (Dr. O.A.). The sleeve method described for circumcision was modified to a “short double slit method,” and used for all patients in the study. The starting point was the stenotic ring. The foreskin was retracted delicately backwards till the stenotic ring was exposed. First the superficial layer of the stenotic ring was incised circumferentially, and the penile skin was dissected without loss of any intact tissue (Figures 1A and 1B). Then, the stenotic ring was incised using a scalpel deeply for 1-2 mm at the 12 o'clock position to expose the glans penis (Figure 1C). After exposure of the glans penis and identification of penile mucosa, the internal aspect of the stenotic ring was incised circumferentially (Figure 1D). In other words, the first and the second circumferential incisions performed through the healthy skin in the proximal end of the fibrotic ring, and through the healthy mucosa in the distal end of the fibrotic ring, respectively. Consequently, the stenotic ring between the two lines of incision was excised circumferentially and

then removed (Figure 1E). Afterwards skin and mucosa were re-sutured with absorbable sutures (Figure 1F). Follow-up:

All patients were discharged on the day of surgery. As an anti-inflammatory analgesic, ibuprofen in a dose of 5 mg/kg was given at 8-hour intervals. Dressing with 0.2% nitrofurazone ointment was initiated. Control visits at the first and fourth weeks postoperative were performed.

RESULTS

A total of 13285 circumcisions by thermocautery under local anesthesia were performed in our institution during the period studied. All patients had follow-up two control visits at first and four weeks after the procedure, respectively. A total of 48 (0.36%) patients developed phimosis after circumcision by thermocautery. Among them, 16 cases had been treated and followed up by other physicians and were excluded. The median age was 5.1±1.1 years (range, between one and eight years) of the remaining 32 iatrogenic phimosis cases. Phimosis developed in the four weeks after circumcision in all cases. Physical examination assessed the phimosis as grade 5 in 20 patients and grade 4 in 12 patients, based on the classification by Kikiros et al.⁽³⁾ The other complications in the whole group with thermocautery were surgical site infection in 13 patients, meatal stenosis in

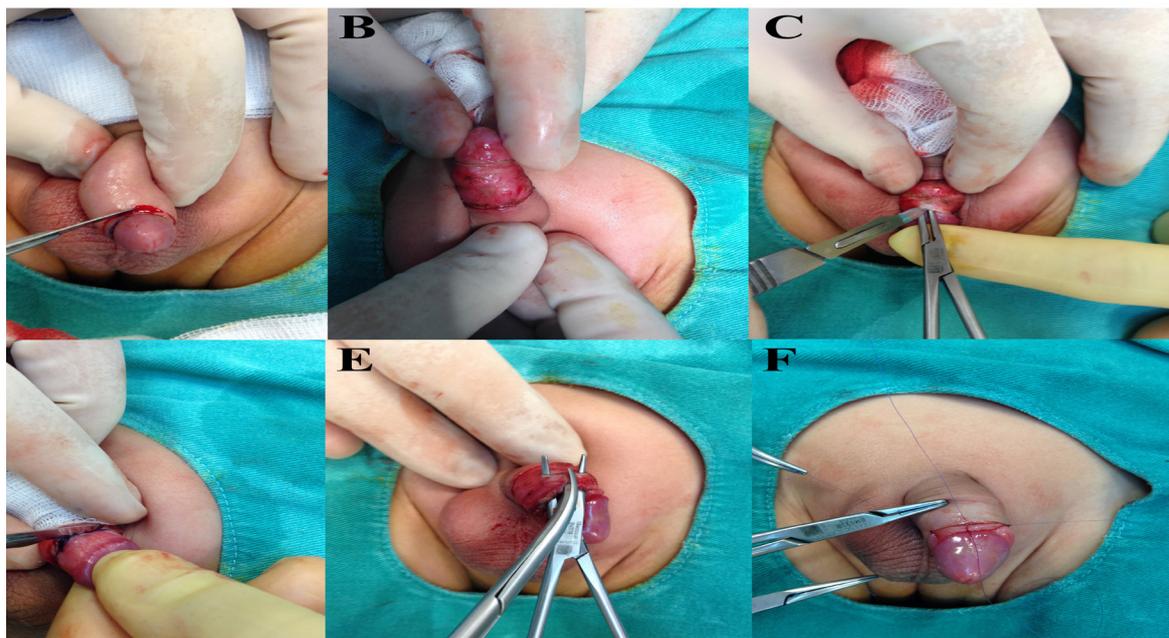


Figure 1. The flowchart of patients with phimosis after thermocautery.

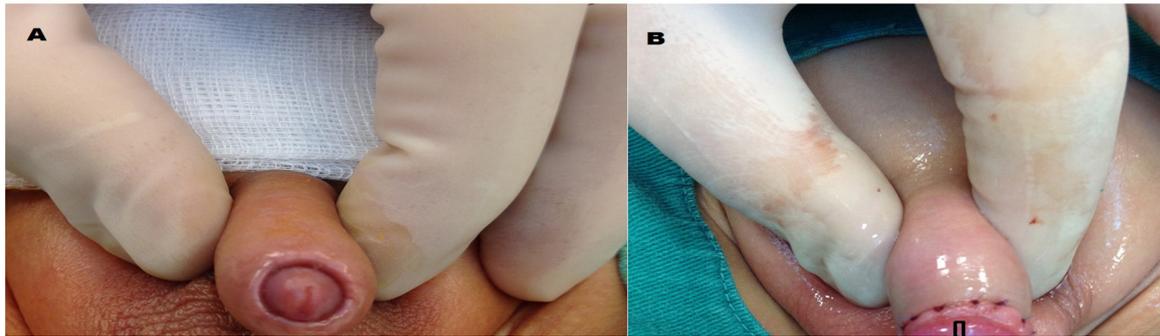


Figure 2. (A) Appearance before surgical intervention. (B) Appearance after surgical intervention . (B arrow sign) The mark left on glans penis by stenotic ring.

3 patients, epidermal cyst in 2 patients and inadequate skin removal 1patient. There was no bleeding requiring surgical intervention.

No perceptible response to topical steroids was observed in the grade 5 cases. Only three patients with grade 4 phimosis had a transient and limited downgrade of phimosis to grade 3, but all these patients then progressed back to grade 4 in two weeks despite prolonged steroid treatment. In conclusion medical treatment with topical steroids showed no efficacy in the management of phimosis associated with thermocautery, and all patients proceeded to surgery.

The modified sleeve technique as described above was performed for correcting the phimosis in all cases. The mean operative time was 25 ± 2.3 minutes (range, between 18 and 40 minutes). No intraoperative or postop-

erative complications developed. The pre- and post-operative appearances of the penises are shown in **Figures 2A, and 2B**, respectively. Significant constriction of the stenotic ring on the glans is seen in **Figure 2B** (arrow). Notably, in cases with shortened penile skin from the original circumcision, maximum cosmetic and functional outcomes were achieved without further shortening of the penile skin by this modified technique. The consequence of patients in each step is summarized in **Figure 1**.

DISCUSSION

Circumcision is one of the most ancient surgical interventions, and still among the most frequently applied surgical procedures throughout the world.⁽⁴⁾ It has been postulated that approximately 30% of males over 15 years of age in the world have had circumcision surgery. Although the majority of these men are Muslims, if one also considers the social and medical reasons for circumcision in the non-Muslim world, the rate of circumcision can rise to 33% throughout the world.⁽⁵⁾ In our country, almost all boys are circumcised due to religious considerations. Our hospital is located in a crowded region; several organizations sponsor circumcisions for children from low income circumstances. Therefore, approximately 20 to 30 circumcisions are performed daily at our institution, increasing during the summer when these organizations are more active. As a consequence, we were able to include such a large number of patients in this study.

On the other hand, physiologic phimosis is described as the inability to retract the foreskin due to adhesions between the foreskin and the glans. This condition accounts for 96% of the cases seen during the neonatal period, and with age it disappears down to 1%.⁽⁶⁾ Pathologic phimosis develops as a result of inadequate hygiene, recurrent episodes of balanitis or balanoposthitis, or forceful retraction of the foreskin, all of which lead to scarring of the preputial orifice.⁽⁷⁾ However, phimosis is also observed as a frequent complication following circumcision, particularly with the use of thermocautery during the procedure, resulting in extremely thicker and harder stenotic rings than those with physiologic phimosis. This condition may be related to the surgical intervention itself or it may occur due to energy sources such as the thermocautery.

In Eastern societies, greater numbers of circumcisions are performed, mostly under local anesthesia, because of extremely large numbers of children to be circumcised

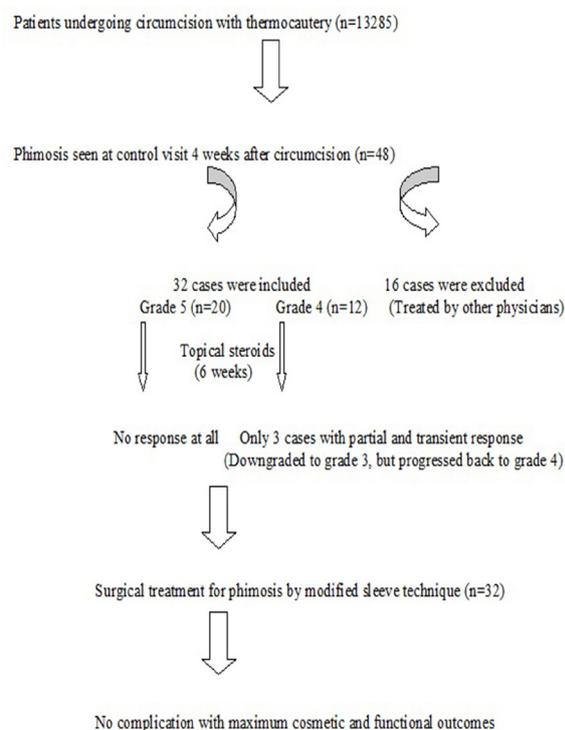


Figure 3. The flowchart of patients with phimosis after thermocautery.

and insufficient hospital beds and operating rooms to accommodate them. Therefore, an easy to perform and cost-effective procedure for circumcision under local anesthesia would gain great popularity. Thermocautery is one such method and has been used widely in Eastern societies. The greatest advantage of thermocautery is that it is associated with minimal or no bleeding at all. Karaman et al. have demonstrated that even in patients with bleeding diathesis, thermocautery can be safely used for circumcision.⁽⁸⁾

There are no adequate clinical or experimental studies in the literature on histopathological changes following circumcision with thermocautery. According to a histopathological examination, the depth of the thermal effect on the cortical tissue was reported to be only 0.1 mm.⁽⁹⁾ In a recent study performed on rats, the authors have shown that use of thermocautery for circumcision is a safe method resulting in better wound healing and without any notable complications.⁽¹⁰⁾ However, they observed more intense collagen proliferation and granulation than that of monopolar and bipolar incisions. Examination was carried out at the fifth day after surgery, while a longer time period would be required to develop a stenotic ring, based on this higher granulation and collagen deposition.

Another advantage thermocautery is that it provides a reasonable approximation and adhesion of wound edges without suturing, especially in small children. Arslan et al. reported that they did not use sutures with thermocautery in 3,420 small children out of 5,870 circumcision procedures.⁽¹¹⁾

The most frequently encountered complication after circumcision by thermocautery is the development of phimosis. This outcome is more frequently seen in cases with a concealed (buried) penis. Secondary to the development of phimosis, the glans penis is trapped, and in some cases, almost imperceptible. Aydođdu et al. indicated that phimosis developed in 20% of the cases of circumcision by thermocautery, and all of these cases underwent surgical correction.⁽¹²⁾ However, they did not specify the kind of surgical approach they used. In our research, we observed a rate of 0.36% for phimosis after thermocautery.

As in the case of congenital phimosis, steroid creams can be tried for healing phimosis. In this study we applied a potent steroid cream preoperatively for six weeks in all patients. However, no persistent healing of phimosis was observed in any patient. On the other hand, in cases with congenital phimosis, steroid creams with low potency can relieve phimosis in the majority of cases. Esposito et al. reported success rates from 65% to 95% using steroid creams in cases of congenital phimosis.⁽¹³⁾ Therefore, early surgical treatment should be suggested for these cases to avoid emotional disturbances resulting from delaying medical treatment.

In the past, we used a dorsal slit to treat phimosis associated with thermocautery. However in cases with a shorter foreskin and/or mucosa, the dorsal slit method could lead to unnecessary tissue loss. Furthermore, particularly in cases with trapped penis, the length of the mucosa, and thickness of the stenotic ring cannot be determined. Contrary to stenotic rings seen in congenital phimosis, fibrotic rings with up to 7-8-mm thickness may develop in these iatrogenic cases. Therefore, a more optimal and standard technique than the dorsal slit is required for the correction, based on our previous

unpleasant experiences. This new technique is in fact a modification of the sleeve method for circumcision. In this method, the skin is incised circumferentially and then excised, with the aim of preserving as much skin length as possible. The mucosa was incised at the 12 o'clock position and glans penis exposed. Mucosa of a suitable length was retained and incised circumferentially. The thick stenotic ring in between was removed and then re-sutured. With this modified method, excessive shortening of the foreskin is avoided and an optimal cosmetic appearance is achieved.

This is the first report in the literature describing the modified sleeve technique for treating phimosis associated with thermocautery. As this problem usually emerges soon after circumcision, both the families and the children can experience serious psychological trauma. Therefore, an early and easy treatment approach with reasonable cosmetic results should be advised for these patients. This study provides an optimal surgical approach for these patients, and suggests that medical treatment with topical steroids has no place in cases of phimosis associated with thermocautery.

CONCLUSIONS

In this study, we first document that topical steroids have no role in the management of iatrogenic phimosis associated with circumcision by thermocautery. Consequently, early surgery is required to minimize emotional disturbances. Additionally, phimosis associated with thermocautery has much thicker and harder stenotic rings. Finally, we describe the modified surgical method for the first time in the literature for treating phimosis associated with thermocautery. The modified sleeve excision of phimosis in these cases allows the preservation of a longer foreskin and/or mucosal length and a better cosmetic result.

CONFLICTS OF INTEREST

There are no conflicts of interest.

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