

# Lubrication of Circumcision Site for Prevention of Meatal Stenosis in Children Younger Than 2 Years Old

Hassan Bazmamoun,<sup>1</sup> Manoochehr Ghorbanpour,<sup>2</sup> Seyed Habibollah Mousavi-Bahar<sup>3</sup>

**Introduction:** Circumcision is one of the most common surgical operations throughout the world, and meatal stenosis is one its late complications. We evaluated the topical use of a lubricant jelly after circumcision in boys in order to reduce the risk of meatal stenosis.

**Materials and Methods:** A randomized control trial was performed, in which 2 groups of boys younger the 2 years old underwent circumcision according to the sleeve method. The parents in the study group were instructed to use petroleum jelly on the circumcision site after each diaper change for 6 months. In the control group, no topical medication was used. The children were followed up regularly and evaluated for meatal stenosis, bleeding, infection, and recovery time.

**Results:** A total of 197 boys in each group completed the study. None of the children in the study group but 13 (6.6%) in the control group developed meatal stenosis ( $P < .001$ ). Infection of the circumcision site was seen in 3 (1.5%) and 23 (11.7%) children of the lubricant and control groups, respectively ( $P < .001$ ), and bleeding was seen in 6 (3.0%) and 37 (18.8%), respectively ( $P < .001$ ). The mean time of recovery in the lubricant group was  $3.8 \pm 1.2$  days, while it was  $6.9 \pm 4.2$  days in the control group ( $P = .03$ )

**Conclusion:** Based on the findings of this study, it seems logical to use a lubricant jelly for reducing postcircumcision meatal stenosis and other complications.

Keywords: circumcision, urethral stenosis, lubrication, wound infection

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## INTRODUCTION

Male circumcision means removing the foreskin that naturally covers the head of penis.<sup>(1)</sup> This is a surgery that is widely carry out among Muslims and the Jewish.<sup>(2)</sup> Circumcision is done by different people whether by practitioners in the medical field or by nonqualified regional people. Neglecting hygienic considerations and correct methods in circumcision can lead to dangerous early and late complications. Early complications include bleeding, infection, urinary retention, hematoma,

ischemia, necrosis of the glans, and amputation of the penis, and late complications are meatal stenosis, excessive or not enough prepuce, torsion of the penis, granuloma at circumcision site, circumcised hypospadias, etc.<sup>(3-6)</sup>

Meatal stenosis is an abnormal narrowing of the urethral meatus in men and is most commonly associated with circumcision.<sup>(7)</sup> It is likely that the newly exposed tip of the penis (including the meatus) suffers mild injury as it rubs against a diaper or the child's own skin.

<sup>1</sup>Division of Gastroenterology, Department of Pediatrics, School Of Medicine, Hamedan University Of Medical Sciences, Hamedan, Iran

<sup>2</sup>Division of Pediatric Surgery, Department of Surgery, School Of Medicine, Hamedan University Of Medical Sciences, Hamedan, Iran

<sup>3</sup>Department of Urology, School Of Medicine, Hamedan University Of Medical Sciences, Hamedan, Iran

Corresponding Author:  
Hassan Bazmamoun, MD  
Besat Hospital, Hamedan  
6514845411, Iran  
Tel: +98 912 133 1917  
E-mail: dbazmamoun@yahoo.com

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Over time, this chronic irritation can result in scarring and a narrowing of the meatus. It can also result from mild ischemia that occurs with circumcision.<sup>(8,9)</sup> Injury to the tip of the penis, inflammatory skin conditions (including balanitis and balanitis xerotica obliterans), or prolonged use of urinary catheters can also increase the risk of meatal stenosis.<sup>(8,10)</sup>

Physical examination will reveal a small narrowed meatus. This should correlate with urinating symptoms of urinary obstruction. Upon close inspection, the lower surface of the meatus is often adhered. Measuring the meatus is often unnecessary and will expose the patient to further risk of injury. Surgical intervention with a meatotomy is the most reliable treatment.<sup>(9)</sup> Several studies have been carried out regarding the appropriate age of circumcision, early and late complications of circumcision, the effect of circumcision on reducing the urinary tract infection, and comparing different techniques for doing circumcision in Iran.<sup>(11-14)</sup> Nonetheless, published study lack enough suggestions on postcircumcision care such as the use of mineral oils for reducing complications.

Some authors have reported routine use of lubricants to the meatal area after circumcision.<sup>(15)</sup> Given the good results of applying petroleum jelly to the meatal area for preventing the recurrence of stenosis after meatotomy,<sup>(8)</sup> and also its good effect in preventing soap-related chemical urethritis,<sup>(16)</sup> we decided to perform a randomized controlled trial to evaluate postoperative lubrication of the circumcision site for prevention of meatal stenosis.

## MATERIALS AND METHODS

This study was a randomized controlled trial carried out on 400 boys younger than 2 years old referred to Ekbatan Hospital in Hamedan, Iran, between January 2006 and December 2007. They were referred for circumcision and a written informed consent was obtained from their parents for participation of their children in the study. The study design was approved by the local ethics committee.

The sample size, according to previous studies was

calculated to be 200 subjects for each study arm based on the following:  $p_1 = 20\%$ ,  $p_2 = 10\%$ ,  $\alpha = 5\%$ , and  $\beta = 20\%$ . The children were divided according to the simple random sampling method into 2 equal groups. Children in the first group underwent circumcision and used commercially available petroleum lubricant jelly for 6 postoperative months (lubricant group), while those in the control group did not use any topical medication after circumcision. All circumcisions were done by one surgeon according to the sleeve method,<sup>(17)</sup> and a gentamicin-soaked gauze was applied to the circumcision area in all cases.

Children in both groups were evaluated for 6 months (every other day for the first 2 weeks, then once per week for 1 month, and then every fortnight and also whenever a specific problem appeared). The parents in both groups were instructed to consider hygienic principles. In addition, parents in the lubricant group were instructed to apply the lubricant jelly to the glans and meatal area after each diaper change. Diagnosis of meatal stenosis was made according to the history given by parents and direct observation of urinary caliber and meatus (loss of elliptical shape to a circular shape), difficulty in urination, high flow of urinary stream, pain during urination, and the need to sit or stand back from the toilet bowl to urinate. Also the recovery duration of the circumcision scar, infection, and bleeding of the circumcision site were assessed according to the history given by the parents and physical examination.

The collected data were analyzed using the SPSS software (Statistical Package for the Social Sciences, version 13.0, SPSS Inc, Chicago, Ill, USA). Comparisons between the two groups were done by the chi-square test, the Fisher exact test, and the t test, where appropriate. A *P* value less than .05 was considered significant.

## RESULTS

Four hundred boys younger than 2 years old participated in the study, and 6 (3 in each group) were excluded from the analysis because of irregular follow-up visits. The mean age was  $8.7 \pm 5.7$  months (range, 8 days to 23 months) for the children in the lubricant group and  $9.2 \pm 8.1$

months (range, 10 days to 23.5 months) for those in the control group ( $P = .67$ ).

None of the children in the lubricant group developed meatal stenosis, while 13 (6.6%) in the control group developed postcircumcision meatal stenosis ( $P < .001$ ). Infection of the circumcision site was observed in 3 (1.5%) and 23 (11.7%) children of the lubricant and control groups, respectively ( $P < .001$ ). Six boys (3.0%) in the lubricant group and 37 (18.8%) in the control group had postcircumcision bleeding ( $P < .001$ ). Finally, the mean time of recovery in the lubricant group was  $3.8 \pm 1.2$  days, while it was  $6.9 \pm 4.2$  days in the control group ( $P = .03$ ).

## DISCUSSION

Diagnosis of meatal stenosis has been reported in 0.9% to 11% of the boys undergoing circumcision.<sup>(7,14,18)</sup> However, higher rates may be seen in areas in which the procedure is done nonqualified regional people.<sup>(14)</sup> The present study showed that using petroleum jelly after circumcision was considerably effective for reducing the frequency of postcircumcision meatal stenosis. We did not observe any case of meatal stenosis in children whose circumcision site was lubricated for 6 months, while with the operation of the same surgeon, 6.6% of the children in the control group developed stenosis. To our knowledge, there is no similar study regarding the effect of lubricants for reducing postcircumcision meatal stenosis.

We found less frequent cases of postcircumcision bleeding in boys with lubrication of the circumcision site when compared with the control group. Bleeding has been reported as the most common early complication after circumcision and its prevalence was reported between 1% and 23 %, depending on the experience and talent of the practitioner and the technique used.<sup>(19,22)</sup> Our main goal was to prevent meatal stenosis, but lubrication was also effective in reducing the early episodes of bleeding. We also achieved good results regarding the infection in the circumcision site. Different statistical findings, ranging from 0.1% to 3.9%, have been reported in other studies for the prevalence of infection at the circumcision site.<sup>(12,21,22)</sup> These figures depend on the practitioner's skill and the

technique used. There were no similar studies to show the effect of lubrication on this kind of infection. Okeke reported application of bland petroleum jelly to the external urethral meatus in boys with chemical urethritis and yielded promising results.<sup>(16)</sup> Lubrication might be effective in reducing inflammation of the procedure site, and consequently, in reducing the rate of infection. Finally, as the patient's needs concerns, shortening the recovery period is an aim of postoperative care. With lubrication of the circumcision site, we reduced it from an average of 6.9 days to less than 4 days.

## CONCLUSION

Based on the findings in this randomized controlled study, we can conclude that using petroleum jelly after circumcision is considerably effective for reducing postcircumcision meatal stenosis and other complications.

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## CONFLICT OF INTEREST

None declared.

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