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Late complications of circumcision in Iran

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Abstract Today, circumcision is the most commonly performed surgical procedure worldwide. Early and late complications may occur due to circumcision. To find the prevalence of late complications of circumcision, we studied 3,205 elementary-school boys aged 6–12 years in 2002. All of them were Iranian and Muslim. Nearly 3,125 of the boys have been circumcised. Most of the boys (2,214 boys) had been circumcised after 2 years of age. Moreover, most of them were operated by traditional circumcisers (43.49%). Late complications (7.39%) were reported in 231 boys. Excessive residual foreskin was seen in 113 children (3.6%). Excessive removal of skin was detected in 42 boys (1.3%), meatal stenosis in 29 boys (0.9%), granuloma in 22 boys (0.7%), penile rotation in 17 boys (0.5%), and 8 boys had secondary chordee (0.2%). The complication rate was not different between the neonatal circumcision and older groups. We suggested that circumcision should only be performed in medical institutions by suitably trained specialists.

Keywords Circumcision · Complication · Male · Iran

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Introduction

Circumcision is one of the oldest of all surgical procedures. Currently, one-sixth of the world's male population approximately is circumcised, mostly on religious grounds [1]. Its ritualistic form has been maintained in West Africa for more than 5,000 years, and in the Middle East for at least 3,000 years [2, 3]. In our country, all Muslim boys are ritually circumcised at some time between the neonatal period and the age of 4–5 years.

When circumcision is performed by an experienced surgeon, it is considered as a routine and a safe surgical procedure. However, despite its advantages, circumcision may become very detrimental if performed by an unqualified person. Moreover, when it is performed in a greater number of people, the risk of complications increase [1, 4, 5]. So, many complications may arise on account of circumcision. The late complications of circumcision include errors of omission and commission, concealed penis, meatal stenosis, inclusion cysts, secondary chordee, urethrocutaneous fistula, phimosis, and lymphedema [1, 6].

Until now, many studies have been published about male circumcision and its early complications, but studies reporting the exact community prevalence of late complications of circumcision are scarce [6]. Herein, we decided to report the prevalence of late complications due to circumcision in the west of Iran, among boys for whom this procedure is ritually mandatory.

Materials and methods

To determine the prevalence of the late complications due to circumcision in Lorestan province, we designed a cross-sectional study. This study has been conducted by Lorestan University of Medical sciences and approved by the ethics committee of this university. We studied 3,125 circumcised elementary-school boys aged 6–12

years in 2002. Twenty-one elementary schools in Khorram-Abad city, center of Lorestan province, have been selected by probability proportional to size method. About 150 students have been examined from each school, including all five educational grades, by cluster random sampling method. Informed consent has been taken from the parents of the selected students.

Genital examination of selected cases was done by two skillful physicians in a private examination room, at each of the selected schools. An urologist and a general surgeon observed all examinations during the study period. As indicated, late complications of circumcision have been defined as: excessive residual foreskin, excessive foreskin removal, meatal stenosis, granuloma, penile rotation, and secondary chordee.

The frequency of late complications were reported according to the age of circumcision (neonatal ages or older ages), and the persons who performed the operation. Operators were divided into fully trained surgeons and urologists, general practitioner and pediatricians, paramedical personnel (nurses and health care providers), and traditional circumcisers.

Data were analyzed by SPSS using windows version 11.5 (New Jersey, USA). Chi square test was used to find the statistical differences.

Results

Of 3,205 examined boys, 3,125 were circumcised (97.5%). Most of the boys (2,214 boys) were circumcised after 2 years of age (70.85%). Four hundred and seventy-one boys had been circumcised when they were between 1 and 2 years of age. The age for circumcision for the other boys was less than 1 year (88 neonatal circumcision (2.82%), 176 in 1–6 months (5.63%), and 176 in 6–12 months (5.63%).

All the boys examined were Iranian and Muslim. Among 3,125 circumcised boys, 989 were operated either by surgeons or by urologists (31.64%), 591 by general practitioners or pediatricians (18.91%), 186 by paramedical personnel (5.95%), and the remaining 1,359 boys were operated by traditional circumcisers (43.49%) (Fig. 1).

In this study, 92.61% cases had normal examination findings. The prevalence of complications was 739 out of 10,000 in our region. Excessive residual foreskin was the most common complication, seen in 113 boys (3.6%). The other complications in descending order were: excessive skin removed, meatal stenosis, granuloma, penile rotation, and chordee was detected in 42 cases (1.3%), 29 cases (0.9%), 22 cases (0.7%), 17 cases (0.5%), and 8 cases (0.2%), respectively.

In our study, we did not detect any urethrocutaneous fistula, phymosis, lymphedema, amputation, or cancer.

The frequency of late complications among boys, who had been circumcised during neonatal period was 5.68% (5 cases), and in boys, who were circumcised in

older ages was 7.44% (226 cases). This difference was not statistically significant.

The frequency of complications occurring among children circumcised by paramedical personnel was higher than other groups (P value = 0.0001; Table 1).

Discussion

Lorestan province is situated in the west of Iran with a population of 1,700,000. The population of this region is mostly rural, who have migrated to cities. Some of the peoples are nomads.

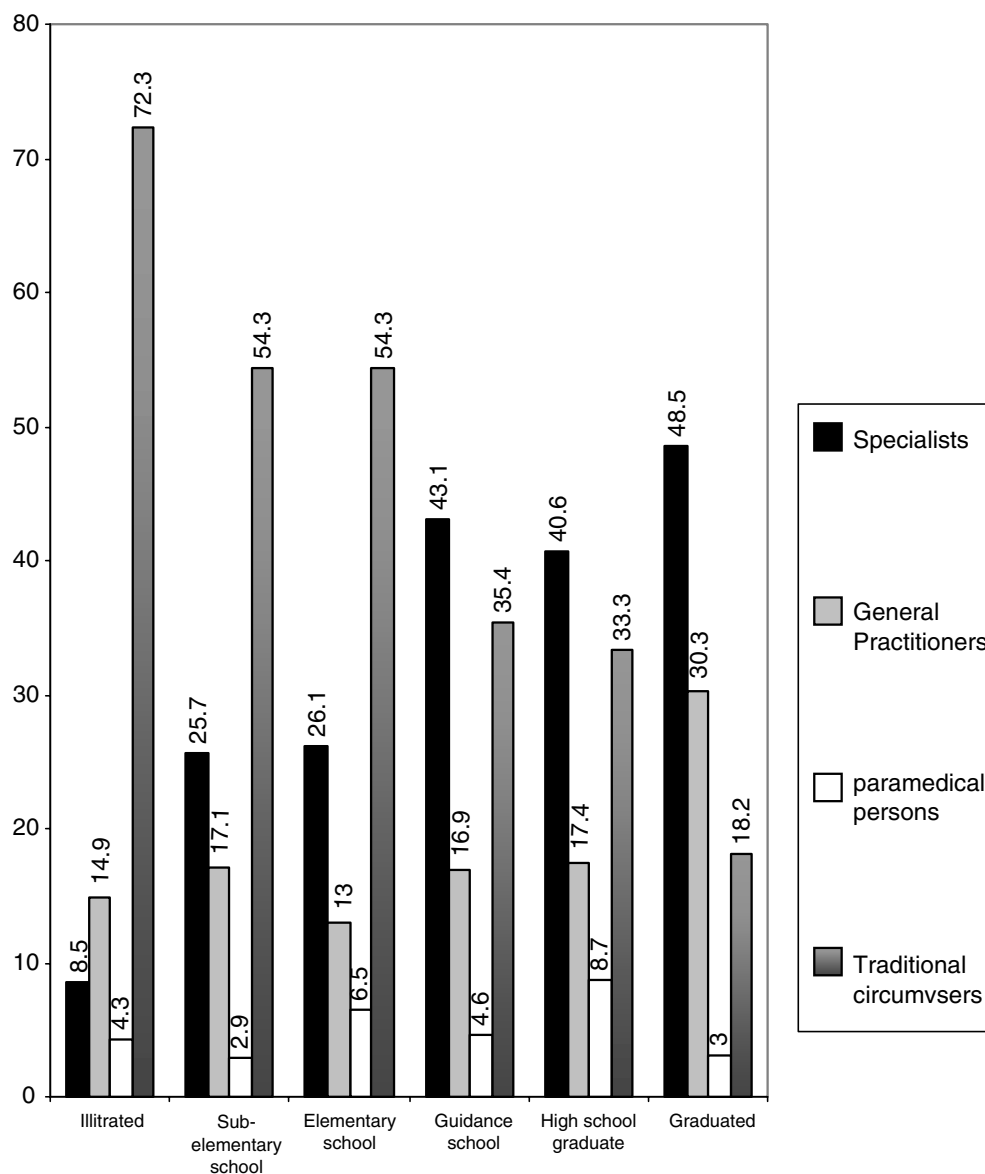
Due to the ritual rites, almost all the examined boys had been circumcised. Most of the circumcision procedures had been performed during childhood (2–12 years). Although our findings about the age of circumcision are not applicable to all parts but to most of the regions in Iran; it agrees with the literature and previous studies from Muslim countries, which revealed that the procedure is performed mostly between 4 and 13 years [4, 5, 7, 8]. Unfortunately, traditional circumcisers called “looti” had performed most of the procedures. They are mostly barbers, or drummers who used to perform circumcision. As in other Muslim countries [5], they are not medically trained and there is no supervision on their operations. The technique they adopt is the cutting of inner and outer layers of prepuce, without any suture and sedation. Sterility of their equipments is also questionable.

In our study, late complication rate of circumcision was 7.3%, which was higher than the other similar study performed by Ben Chaim et al. [6], which reported this rate as equal to 0.2%. It seems that Ben Chaim et al. [6] only evaluated patients who were referred to their clinics. They stated that most of the procedures were performed by traditional circumcisers (Mohels). Maybe, some patients had not been referred for further evaluation. By the way, it can be suggested that, late complication rates are very high in our region.

In our study, age of operation was not related to incidence of late complications with regard to circumcision. The question whether performing circumcision in neonatal period or older ages needs further studies focused on early complications beside late anatomical problems.

We estimated that complications were more in traditional type of circumcision. But, the findings became interesting when we noted that the relative frequency of complications was higher among boys who had been operated by paramedical personnel, general practitioners, and pediatricians. Ahmed et al. [7], reported 48 patients with severe complications related to traditional operators. Studies from Turkey revealed that traditional circumcisers are the leading cause of severe and unusual complications of circumcision [4, 5, 9]. In Israel, traditional circumcision is the sole or main occupation of the trained Mohels; therefore, most of them are professionals and experienced, and complications are

Fig .1 Selection of circumciser by the parents according to their educational status



rare [6]. It seems that traditional circumcisers in Iran are experienced, although there is no supervision by health authorities on their practice. The question is why paramedical persons and untrained physicians were reported to cause most of the complications as per our study? We think that this problem relates to the ineffective education and their restricted experience.

The estimated incidence rate of excessive residual foreskin is 0.1–9.5% [4, 6, 10], which was in concordance with our study. Demirseren et al. [5] reported two cases of incomplete circumcision among 15 patients who were referred during a period of 7 years to their clinic. Other studies reported 56 and 46 cases that underwent revision of circumcision [11, 12]. Although the studies on

Table 1 The complication rates according to the medical qualifications of the circumcisers

Complications of circumcision ^a	Urologists/ general surgeons	General practitioners/ pediatricians	Paramedical persons	Traditional circumcisers
Excessive residual foreskin	13 (1.31%)	21 (3.55%)	9 (4.83%)	70 (5.15%)
Excessive skin removal	9 (0.91%)	4 (0.67%)	7 (3.76%)	22 (1.61%)
Meatal stenosis	12 (1.21%)	8 (1.35%)	4 (2.15%)	5 (0.36%)
Granuloma	6 (0.6%)	10 (1.69%)	1 (0.53%)	5 (0.36%)
Secondary chordee	1 (0.1%)	7 (1.18%)	–	–
Penile rotation	–	7 (1.18%)	5 (2.68%)	5 (0.36%)
Total	41 (4.14%)	57 (9.64%)	26 (13.97%)	107 (7.87%)

^aNumber (percent from total circumcised patients by any group)

frequency of this complication are rare, it can be concluded that excessive residual foreskin is the most common complication after circumcision. This complication may result in true phimosis, wound contraction and cicatrization of the distal foreskin, and unsatisfactory cosmetics [1]. Unqualified hands [5] and technical errors are the leading cause of this complication.

In our study, excessive skin removal was found in 1.3% of patients. Major degrees of excessive skin removal, as a complication of circumcision is fairly common. Minor degrees of excessive skin loss appear to have attracted less attention in the literature. The causes of such loss being usually either a complicating infection, the use of the electrocautery, or improper surgical technique (i.e. too much pulling of the foreskin over the glans, and incomplete separation of ventral foreskin during operation) [13–15].

The incidence of meatal ulceration following circumcision is reported in 8–20% of cases [1], but we could not find any literature regarding the prevalence of meatal stenosis. Upadhyay et al. [16] and Persad [17] reported 50 and 12 patients, respectively, who had been referred with meatal stenosis caused by circumcision. Meatal stenosis as a cause of recurrent pyelonephritis and obstructive uropathy is an underrecognized complication of circumcision, mostly reported in neonatal and nappy aged boys [16]. However, most of our patients were circumcised in older ages. Since the protective covering of the foreskin is lost after circumcision, some malpractices, such as using irritants including povidone iodine, cause this harmful complication in these age groups.

Granuloma, called inclusion cyst [18], is scarcely reported in previous literature. In a prospective study, Atikeler et al. [19] reported this complication rate at about 5%, during 3.2 months of follow-up. In our study, this rate was significantly lower. Regarding the etiology of granuloma, which is related to surgical material and any foreign body in the surgical site, our lower rate, can be suggestible. For, the kind of suture products from different manufacturers are not similar. Moreover, in our study the time of examination was far from the time of circumcision. During this period, mass lesions may disappear. Traditional circumcisers do not use any suture, but they caused granuloma formations. The major problem with them is, using herbal and some other materials, such as penicillin powder, for dressing the shaft. We think that these materials may cause granuloma formation.

Secondary chordee is the result of excessive foreskin removal and wound dehiscence that healed by secondary intention [20]. Using gutine technique may result in excessive skin removal and subsequent secondary chordee.

The rate of penile torsion was about 0.5% in our study. Ben Chaim et al. [6] reported the rate of penile torsion as equal to 0.02%. As severe chordee, penile torsion may affect cosmetic appearance of the genitalia or result in sexual dysfunction.

We did not detect any severe complications including, amputation of glans penis, amputation of penis, urethrocutaneous fistula, and concealed penis in our study.

Due to the serious complications that entail, circumcision should be performed by trained surgeons and urologists, and should be legally prohibited to unqualified hands. Our study was restricted to late complications of circumcision. Follow-up studies are recommended to determine both early and late complications.

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