

Comparison of the Late Complications of Circumcision in Different Age Groups

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Received 2016 October 10; Revised 2017 January 14; Accepted 2017 May 10.

Abstract

Background: Circumcision is the most common surgical procedure throughout the world today and is usually performed in children for medical, cultural, or religious reasons. In most countries, nonsurgeons or traditional circumcisers perform this procedure, however, there is still a debate regarding the proper age of circumcision.

Objectives: To determine the best and appropriate time for circumcision, we compared the late complications of this procedure between patients who are circumcised in different age groups.

Methods: This is a retrospective and descriptive study that was performed on patients who were referred for late circumcision complications. The patients were divided according to the age range of circumcision as well as the performed age, which were divided into 4 groups (neonate, infant, child, and adolescent) by the author, during the period of May 2010 to December 2013 at an urology clinic. All late complications that were obtained were analyzed and compared between these groups.

Results: Overall, 120 cases of patients were enrolled. The mean age of neonates, infants, children, and adolescent were 14 ± 2.5 days, 4 ± 1.5 months, 6 ± 0.5 years, and 14 ± 1.8 years, respectively. All of them have been circumcised by the classic method. The most common complication (15 patients) was meatal stenosis (12.5%) and was more prevalent in neonates 8 (29.62%).

Conclusions: The ratio of late complications of circumcision is significantly higher in neonates and infants as compared to children as well as adolescents. The results of this study showed that for prevention of developing postoperative complications, the appropriate age of circumcision is to be a child as well as adolescent. For prevention of debilitating and prolonged complications, it should only be performed in medical institutions by suitably trained surgeons.

Keywords: Circumcision, Complications, Neonate, Infant, Child, Adolescent

1. Background

Circumcision is the cut off of the end of the foreskin of the penis (prepuce). It is one of the most common ritual and elective surgeries that is performed from neonates to even adults for some credible reasons such as as religious, cultural, and hygiene or preventive health care causes (1, 2). In a traditional method, the foreskin is removed surgically after opening and separating it from the glans. Some circumcisers use a device for better removal of the foreskin (2). Occasionally, for reducing pain and stresses, the operators use topical or locally injected anesthesia, where sometimes the general anesthesia is necessary, especially for older patients (3). There are some other circumcision techniques in the world, which require using different devices (Gomo, plastipell,...), however, traditionally hand manipulated methods, due to its simplicity, affordability, and safety is more common in Iran. The religious rea-

sons for Muslims as well as Jewish individuals are the major indications of the circumcision procedure, while other reasons are cultural, medical, and recently, public health (4). About 60% of male neonates were circumcised in the United States in 1992. Furthermore, according to male birth records in Iran, about 500000 neonatal circumcisions were performed in 2011 (5-7). Although this procedure is usually performed on neonates and children for religious rituals and cultural reasons, however, in other cases, especially in adults, it may be done for both therapeutic and prophylactic purposes such as as phimosis, refractory balanoposthitis, and chronic urinary tract infections (UTIs) (8). Some contraindications also suggest for elective circumcision as certain genital structure abnormalities or poor general health (9).

The circumcision has a significant role in prevention of penis malignancies, genital as well as urinary tract infections, and sexually transmitted diseases (STDs). For cre-

ating an HIV-free generation in East and Southern Africa, WHO recommended Voluntary medical male circumcision (10).

Complications of circumcision are divided into acute (perioperation) as bleeding, infection, urinary retention, wound infections, and rarely some major complications as necrosis and amputation of the glans and even rarely death (11). The late complications are as inappropriate foreskin removal, adhesion or skin bridge, inclusion cysts formations or, meatal stenosis, iatrogenic phimosis, chordea, hypospadias, epispadias, and urethrocutaneous fistula (1, 12). The complication rates of circumcision procedures is approximately 2 to 5 per 1000 cases and most authors report it from 0% to 16% (median frequency 1.5%) (12, 13).

Usually, circumcision by a trained practitioner with proper instruments under aseptic conditions is done easy, fast, and persuaded. However, such conditions are not always available in every region; therefore, there are no sufficient reliable clinically studies on late complication rates of male circumcision in developing countries. In this report we describe the findings of 120 cases referred for late complications after a circumcision.

We think, although the results of a circumcision procedure is related to well trained practitioners with proper instrumentations, the age range of the patients has a significant role in the outcome of this operation; therefore, to determine the suitable age for circumcision, we evaluated late circumcision complication rates in different circumcised patients.

2. Methods

One hundred and twenty patients, for late circumcision complications, were referred to our clinic within 3 years (2010-2013), where we evaluated their data retrospectively. We assessed their information as age, method of circumcision, circumcision provider, and type as well as frequency of the late complication. We excluded patients with a history of penile congenital abnormalities (e.g. Hypospadias) and acute circumcision complications (perioperative complications) or re-operated patients in this study. To match our sample, we excluded those who were circumcised by other methods than manual techniques (device methods as Gomo clamp, Plastibell,...). This study was approved by the ethics committee of our University research center. Patients were divided into 4 groups of neonates, infants, children, and adolescents, then, compared a late complication between them.

3. Results

The frequency distribution of complications is given in Table 1. The mean age of all groups as neonates, infants, children, and adolescent were 14 ± 2.5 days, 4 ± 1.5 months, 6 ± 0.5 years, and 14 ± 1.8 years, respectively. The average duration from circumcision was 3.8 ± 2.7 (1.5 - 4.7) years. In this study, in patients with complications, only 7 (8.33%) of the circumcisions were performed by the physician, 13 (10.83%) by health technicians, and the remaining 97 (80.83%) by traditional circumcisers (< 0.05). The most common complication (15 patients) was meatal stenosis (12.5%), which was more prevalent in neonates 8 (29.62%) (Tables 1-3).

There was a significant positive correlation between age and overall complications. In addition, the complication rate is higher in traditional circumcisers than by doctors and health technicians. This indicates that the consideration of scientific and standard recommended measures by trained personals will decrease from complications in older patients.

4. Discussion

The rate of post circumcision complications are different in different regions, mostly because of applying various techniques. As Leitch has reported, early and late complications are 8% and 7.5%, respectively (14), also, in another report from Iran, the late complications in boys aged 6 - 12 years was 7.39% and their most common late complication was excessive residual of skin (3.6%), while meatal stenosis was 0.9% (that was less than our results, which may be due to age ranges and referral duration of patients) (15). However, in this study, our aim was to only assess the late complications in relation to the age of circumcision.

The meatal stenosis is the most common, longer-term complication following circumcision, with an incidence variously reported to be 0.9% to 32.1% (15, 16), it is comparable by our results. We found meatal stenosis in 15 patients (12.5%), which was more prevalence in neonates 8 (29.62%).

There is still on-going debate and controversy regarding the ideal age for circumcision, while some studies as B. Baniaghbal suggests neonate-infant ages are more prone for complications as our study addresses on non therapeutic circumciser roles (17).

However, unfortunately, most circumcisions throughout the world are performed by native and traditional circumcisers rather than by medically-trained professionals (18). In our study, those patients with complications included individuals where only 5% of the circumcisions were performed by physicians, 10% by health technician, and the remaining 85% by traditional circumcisers, as

Table 1. Complication Types Comparison of 4 Groups^{a,b}

Late Complications	Group-1 (27)	Group-2 (29)	Group-3 (33)	Group-4 (31)	Total
Insufficient foreskin remove	3 (11.11)	1 (3.44)	1 (3.03)	0 (0)	5 (4.16)
Excessive foreskin remove	4 (14.18)	2 (6.89)	1 (3.03)	0 (0)	7 (5.83)
Adhesions/skin bridges	2 (7.40)	2 (6.89)	1 (3.03)	0 (0)	5 (4.16)
Inclusion cysts	0 (0)	1 (3.44)	3 (9.09)	3 (9.67)	7 (5.83)
Abnormal healing	0 (0)	3 (10.34)	2 (6.06)	2 (6.45)	7 (5.83)
Meatal stenosis	8 (29.62)	5 (17.24)	1 (3.03)	1 (3.22)	15 (12.5)
Phimosis	1 (3.70)	1 (3.44)	0 (0)	0 (0)	2 (1.66)
Chordee	3 (11.11)	2 (6.89)	0 (0)	0 (0)	5 (4.16)
Urethra cutaneous fistula	2 (7.40)	1 (3.44)	0 (0)	0 (0)	3 (2.5)
Total	23 (85.18)	18 (62.06)	9 (27.27)	6 (19.35)	56 (46.66)

^aValues are expressed as No. (%)

^bOverall Chi Square = 33.1373, df = 3, $\alpha \leq 0.0001$ (hence there is strong evidence that the complication distribution differs significantly between these 4 groups of patients).

Table 2. Overall Comparison of Complications Between 4 Age Groups

Groups (Comparisons)		Groups Difference	Chi Square	α = Probability of Type I Error
1	2	0.1571	1.6995	0.637 ^a
1	3	0.5051	20.5508	0.0001
1	4	0.5842	29.845	< 0.0001
2	3	0.348	8.5695	0.0356
2	4	0.4271	13.8708	0.0031
3	4	0.1871	1.8775	0.842 ^a

^aNon significant.

Table 3. Comparison of Circumcision Late Over All Complications in Circumciser Groups^a

Groups	Complications				Sum. No. (%)
	Group-1	Group-2	Group-3	Group-4	
Medical doctors	2	1	0	0	3 (5.35)
Health technicians	6	4	2	0	12 (21.42)
Traditional circumcisers	15	13	7	6	41 (73.21)
Sum.	23	18	9	6	56 (100)

^aThe results are not significant at $P < 0.05$, (1 vs. 2), (1 vs. 3), and (2 vs. 3).

other Iranian study results by Yegane (43.49% traditional circumciser), that are the same as Atikeler et al. results (15, 19, 20). These traditional circumcisers in our country and most of the world have not had any medical training and usually have other jobs such as barbers, public bath workers, and male health institutions co-workers. They usually perform circumcisions by unspecified instru-

ments as barber knives, usually in unsterile conditions (21).

The comparison of over all late circumcision complications between circumcisers in our study was statistically non-significant, however, it may be apparently due to groups sample sizes (Table 3).

The circumcision is generally known as a safe procedure if performed properly by an experienced operator,

otherwise there are immediate and latter complications that may have a lasting detrimental impact on some patients as well as their parents, which may then require surgical correction (22).

As our survey revealed, non-surgeon circumcisers do not have any formal training in performing circumcisions, or even basic knowledge in identifying contraindications to the procedure, they do not have the scientific ability in preventing or managing common postoperative complications. When they encounter with a congenitally penis, abnormal as mild hypospadiasis, or concealed penis, it may have absolute contraindications to circumcision, however, most of them circumcise these neonates without hesitation. In other studies, as well as our results, it was confirmed that the early and late circumcision complications are seen in operations that are performed by unlicensed traditional circumcisers (19).

In addition the psychological effect of circumcision in the memory of infants and children (unexplainable ages) may traumatize them and cause an outbreak in the future as some harmful psychosomatic symptoms and textual behaviors (23). Recent studies indicate that infants and newborns can also experience pain and may have the capacity for longterm memory. Therefore, neonatal circumcision may qualify as trauma of the type that gives rise to the problematic longterm symptoms in adulthood as feelings of abuse, shame, and of being mutilated. Furthermore, some researchers noted that, breathing difficulty and risk of choking during infant circumcision is high and that blood cortisol levels increase (about 4 times than the healthy amount) and may remain high for up about to a year after the procedure, while there is little or no risk of heart rate, choking, breathing difficulties, and increase of cortisol levels during circumcision in older ages or adults (24-27).

Recent studies also showed the protective role of circumcision against prostate cancer development, especially in those circumcised at age ≥ 36 years; they also pointed that the circumcision before the age of 1 year may confer protection (28).

We strongly believe that beside the circumciser knowledge and experience regarding circumcision complications, the age range of patients has a significant role in complication rates. The neonates and most infants naturally have no urine and fecal continence, therefore, the infectious and chemical contaminations by them may cause some post operation complications, such as wound infections, local inflammations, and finally delayed healing as well as late penile deformities especially in neonates with miniature and small penis. We cannot assess properly how much foreskin must be excised and it may cause the post operation complications as phimosis, little or much re-

moval of foreskins.

In addition older children have more cooperation for post operation managements vs. neonate and infants, which helps in early detect and treatments of circumcision complications.

4.1. Conclusion

In our study, the percentage of the late circumcision complications in neonates and infants was higher than children and adolescents (85.18%, 62.06%, 27.27%, and 19.35%), respectively. Thus, for declining of circumcision complications, we suggest the organization of training workshops regarding safe circumcision methods for education of all traditional practitioners of circumcision and also, according to our results from point of late complication rates and reasonability for pre and post operation cooperations, older children are more suitable

Acknowledgments

The authors acknowledges all urology ward's personal for their contribution to this study.

Footnotes

Authors' Contribution: Ali Asghar KeTabchi contributed to the protocol/project development, Data collection, and Mohammad Ahmadinejad, Mariam Farjah- Shahrokhi Ebrahimipour and Yalda R Afshar analyzed data and also contributed to interpretation and writing/editing this manuscript.

Financial Disclosure: The authors have indicated we have no financial relationships relevant to this article to disclose.

Potential Conflict of Interest: The authors have indicated they have no potential conflicts of interest to disclose.

Ethical Standard: This study has been approved by the appropriate ethics committees and have therefore been performed in concordance with the ethical standards laid down in the 1964 Declaration of Helsinki, and all patients gave their informed consent prior to inclusion in the study.

Funding/Support: No external funding.

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