


Cosmetic results of circumcision and scar wrinkling: Do we exaggerate in terms of hemostasis and sutures?

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Abstract

Objective: To objective of this study was to investigate poor scar appearance of the circumcision line and scar wrinkling caused by the sutures placed during the circumcision in primary school age circumcised children.

Methods: A total of 455 children aged between 6 and 9 years, circumcised by four different specialists in our hospital between 2009 and 2018 were evaluated. Circumcisions performed due to balanitis, phimosis, secondary phimosis, and paraphimosis were excluded from the study. Only routine religious circumcisions performed on request of the family were included in the study. Children underwent a second procedure and those receiving treatment after the circumcision due to infection were excluded from the study. About 363 patients included the study. Patients were evaluated according to the Fitzpatrick skin type classification, independent observer scale, Stony Brook Scar Evaluation Scale, and Dunn-Bonferroni test.

Results: No statistically significant difference was found between distributions of scar wrinkling levels in children according to the circumcision ($p > 0.05$). There was a statistically significant difference between age of circumcision according to scar wrinkling levels ($p = 0.001$). According to the Dunn-Bonferroni test; the circumcision age was found to be significantly lower in children with severe scar wrinkling compared to the children with no or mild scar wrinkling ($p = 0.001$; $p = 0.011$).

Conclusion: The tense, short-interval sutures placed away from the wound margin during circumcision in order to control subcutaneous bleeding lead to scar wrinkling and a poor cosmetic appearance. Knowing the risk factors leading to scar wrinkling and taking appropriate measures will provide acceptable cosmetic outcomes after the circumcision.

Keywords

Circumcision, phimosis, scar wrinkling, hemostasis, sutures

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Introduction

Circumcision is a surgical procedure performed mainly for medical, religious, and traditional reasons.^{1,2} Among Islamic and Jewish communities, circumcision is the most commonly performed surgical procedure.^{3,4} There are numerous circumcision techniques. In general, freehand of excision and stitched (forcep guided method, sleeve resection method, dorsal slit, and excision) and device method (Gomco clamp, Mogen clamp, plastibell, tara-clamp, smartklamp) are used according to the surgeon's preference.

There are only a few subjects in the literature that lead to debate as whether newborns could be circumcised or not. This debated surgical procedure is the most commonly

performed surgical procedure in the USA, and it has been stated that circumcision is often performed due to cosmetic reasons.^{1,5} There are many studies demonstrating potential

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Table 1. Questionnaire following the course (Likert scale 0–5).

Is the restrained body posture of the surgeon representative for the real situation
Is the position of monitor and devices representative for the real situation
Are the trocars entry slots representative for the real situation
Is tissue distance and region representative for the real situation
Is limited field of movement and motional capability representative for the real situation

medical benefits of newborn circumcision such as prevention of urinary tract infection. One meta-analysis showed in the first 3 months of life urinary tract infections (UTIs) were present in 2.4% of circumcised boys and 20.1% of uncircumcised boys, who presented with fever.⁶ Circumcision can be recommended in posterior urethral valves and vesicoureteral reflux in order to prevent (UTIs).

An absolute indication for circumcision is secondary phimosis. In primary phimosis, recurrent balanopostitis and UTIs in patients with urinary tract abnormalities are indications for intervention.^{1,7}

Childhood circumcision has an appreciable morbidity and should not be recommended without a medical reason and also taking into account epidemiological and social aspects.⁸

Although it is considered as a simple procedure, it is highly open to complications like other surgical procedures. Early and long term complications of circumcision are well known and in general rate of complications has been reported as 0.2% to 3%.⁹ Common complications associated with circumcision are acute bleeding, wound infection, redundant foreskin. Circumcision performed by medically untrained laymen carry a high complication rate and serious complication. Among surgical clients, bleeding was most common complication on/before day 2 while infections predominated in other follow-up periods. An complication rate of 2% is regarded as the global standard of circumcision safety.¹⁰ Rarely seen complications include meatal stenosis, urethral fistula, partial and total glandular amputations, glandular necrosis, penile curvature, and penile rotation.^{1,11–14} In addition, keloid formation and hypertrophy of the scar are some rare complications causing a poor cosmetic appearance.¹⁵ Hypertrophic scar which causes a poor cosmetic appearance has been reported as one of reasons for revision following incomplete circumcision.¹⁶

Cosmetic good appearance of the circumcision line and penis has been a current issue in recent years. Apart from congenital penile diseases and their operations, the most important factor which may affect cosmetic appearance seems as circumcision. Although there are numerous data regarding common complications of circumcision, cosmetic results in the circumcision line and prevalence of poor cosmetic appearance were not evaluated sufficiently.

Table 2. The Stony Brook Scar Evaluation Scale.

	Scar category	No. of points ^a
Width	>2 mm	0
	≤2 mm	1
Height	Elevated/depressed in relation to surrounding skin	0
	Flat	1
Color	Darker than surrounding skin (red, purple, brown, or black)	0
	Same color or lighter than surrounding skin	1
Hatch marks/	Present	0
Suture marks	Absent	1
Overall appearance	Poor	0
	Good	1

^aTotal score = sum of individual scores; range, 0 (worst) to 5 (best).

The objective of this study was to investigate poor scar appearance of the circumcision line and scar wrinkling caused by the sutures placed during the circumcision in primary school age (6–9 years) circumcised children.

Materials and methods

A total of 455 children aged between 6 and 9 years, circumcised by four different specialists in our hospital between 2009 and 2018 were evaluated. Patients were determined as types 2 and 3 according to the skin pigmentation (Fitzpatrick skin type) classification.¹⁷ Genital physical examination and circumcision control of the children were performed. Children's families were questioned about familiar predisposition that may be involved in scar formation and histories of other wound healing.

Considering the wrinkling caused by circumcision sutures, patients were evaluated by independent observer scale (nurse) and two surgeons. Circumcision incision line was classified as the presence of scar wrinkling in the dorsal, ventral, or lateral sections (Table 1).

The circumcision line was evaluated for scar cosmetic with independent observer scale (nurse) and two surgeons according to the Stony Brook Scar Evaluation Scale (Table 2). This scar evaluation scale is a simple and reliable tool, which can be used to evaluate esthetics or cosmetic appearance of the scars, and is correlated with the other previously approved cosmetic scale such as Visual Analogue Cosmesis Scale.¹⁸ According to this scale, the scars with a score between 0 and 2 were defined as poor and those with a score between 3 and 5 as good.

Exclusion and inclusion criteria

Circumcisions performed due to balanitis, phimosis, secondary phimosis, and paraphimosis were excluded from the study. Only routine religious circumcisions performed

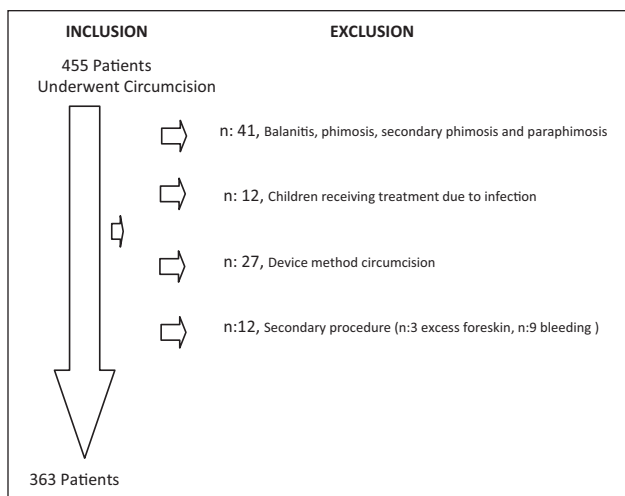


Figure 1. Flow diagram of study population with patient inclusion and exclusion criteria.

on request of the family were included in the study. Children underwent a second procedure and those receiving treatment after the circumcision due to infection were excluded from the study. Circumcisions performed with Freehand method were included (Figure 1).

We evaluated primary school age children group in which re-circumcision and repeating phimosis despite the circumcision are less common.

Statistical analysis

The study was conducted in accordance with the principles of the Declaration of Helsinki. Statistical analysis was performed using NCSS (Number Cruncher Statistical System) 2007 (Kaysville, Utah, USA) software. When study data were evaluated, descriptive statistical methods (mean, standard deviation, median, frequency, percentage, minimum, maximum) were used. Student *t* test was used in comparison of normally distributed quantitative variables between two groups, and Mann-Whitney *U* test was used in the comparison of non-normally distributed variables between two groups. Kruskal-Wallis test and Dunn-Bonferroni test were used in the comparisons of non-normally distributed quantitative variables between more than two groups. Fisher exact test, and Fisher-Freeman-Halton exact test were used in the comparison of qualitative data $p < 0.05$ values were considered statistically significant.

Results

A total of 363 children met the inclusion criteria. Age of circumcision differed between newborn and 8 years with a mean age of 4.55 ± 1.60 years. Patients' demographic data, and independent observed scale for the scar cosmetic were not statistically significant between the patient groups with

Table 3. Distribution of descriptive features.

Age (years)	Min–Max (median)	6–9 (7)
	Mean \pm SD	7.27 ± 0.99
Age of circumcision (years)	Min–Max (median)	0.20–8 (5)
	Mean \pm SD	4.55 ± 1.60
Technique used	Other free-hand method	26 (7.2)
	Dorsal slit and excision	337 (92.8)
Scar wrinkling	No	298 (82.1)
	Mild	37 (10.2)
	Moderate	12 (3.3)
	Moderate-severe	7 (1.9)
	Severe	9 (2.5)

and without scar wrinkling ($p > 0.05$). Dorsal slit and excision technique was used in 92.8% ($n = 337$) and other free hand in 7.2% ($n = 26$) (Table 3). Rapid vicryl and bipolar cautery were used in all patients for bleeding control. Stitch materials were 4-0 and 5-0 vicryl rapide suture in all patients. All patients were circumcised due to religious belief.

No statistically significant difference was found between distributions of scar wrinkling levels in children according to the circumcision ($p > 0.05$). However, all the patients with severe scar wrinkling appearance were in the dorsal slit and excision technique group. In addition, no statistically significant difference was found between the age of circumcision and age of the patient during the examination ($p > 0.05$).

There was a statistically significant difference between age of circumcision according to scare wrinkling levels ($p = 0.001$; $p < 0.01$). According to the Dunn-Bonferroni test results performed to determine the difference; circumcision age was significantly lower in children with severe scar wrinkling compared to the children with no or mild scar wrinkling ($p = 0.001$; $p = 0.011$; $p < 0.05$). Similarly, circumcision age of the children with moderate-severe scar wrinkling was lower compared to the children with no or mild scar wrinkling ($p = 0.008$; $p = 0.038$; $p < 0.05$) No significant difference was found according to the Stony Brook Scale in terms of the age of circumcision ($p > 0.05$). No statistically significant difference was found between the Stony Brook Scale scores according to the technique used ($p > 0.05$). Poor scar appearance which has a score of 0–2 was observed in 2.75% ($n = 10$) of the children.

Discussion

Scar is a sign resulted from replacement of the normal functional skin tissue with fibrous tissue during healing of a wound or surgical incision, and is a normal and inevitable outcome of tissue repair. Scar has a wide spectrum from a normal line shape to abnormal enlarged, atrophic, hypertrophic, keloidal, and contracted.¹⁹

Several factors including patient age, skin type, genetic and hormonal factors, anatomic features related to the wound site and type of surgical operation, inflammation, infection occurring in the wound site, tension, and deep of the wound and repair techniques affect wound healing.^{20,21}

Although several factors affecting scar formation are known, the etiology is yet to be fully enlightened.

During circumcision, bleeding may spontaneously stop as well as can be controlled with cautery, compression, and suturing during the procedure.²²



Figure 2. Wrinkling caused by sutures.

We see in daily practice that besides severe bleeding, mild bleeding is also tried to be controlled with abundant sutures with the fear of malpractice. The most commonly used suture in the circumcision is simple interrupted pattern. The needle enters to dermis and epidermis with a right angle and exits from the opposite side with a right angle. The sutures were separately connected at each passage. We think that sutures are more frequently used, because cautery damage urethra in the ventral and causes subcutaneous dermis burns, while compression and bandage require close follow up. Short-interval interrupted and tense sutures may be preferred for this reason in order to control bleeding or placing tight, tense sutures may be continuation of the wound site closure habit at the other incisions. Suture material used in the incision line causes a prolonged and complex natural reaction. The defect left by the suture in the epidermis surface due to various reasons especially tension becomes excessive, causing a poor cosmetic appearance like a railway.²²⁻²⁴ It is seen that continuous or a large number of short-interval and tense sutures placed away from the incision margin cause wrinkling and a poor cosmetic appearance in the incision line.

In our study, presence of suture scars was markedly observed (Figure 2). It was observed that excessive defect left by sutures on the epidermis caused a railway appearance. This railway shape resembled crown cap in the circumcision line due to its circular shape (Figure 3). Crown cap appearance was observed in 9 of 363 cases (2.5%).



Figure 3. Crown cap appearance (scar wrinkling in entire quadrant).

Widely placed sutures away from the incision line were significantly observed. In our study, severe scar wrinkling was thought to be caused by tense and depth of the wound, as demonstrated in a study by Leask and Abraham.²⁵

In our study, age of circumcision was significantly lower in children with severe scar wrinkling compared to the children without scar wrinkling or mild wrinkling ($p=0.001$, $p=0.011$, $p<0.05$). The mean age of circumcision was lower in patients with very severe scar wrinkling (2 years 4 months). This finding indicated that although wound healing process is rapid in infants and children, healing occurred with a wider and marked wound scar, contrary to what is believed.

Retrospective design of the study and lack of a study investigating this issue were limitations of this study.

Presentation to clinics due to poor cosmetic appearance in following years after circumcision is extremely rare.²⁶

This is likely to be resulted from that perception of normal outcomes instead of excellent results may be mistake, and that this may not cause a functional problem. Therefore, lack of a similar study in the literature may be seen as an advantage of the current study. Questioning of persons who had been circumcised in infancy or childhood period for cosmetic appearance of these scars and satisfaction in adolescence and adulthood period may provide us more valuable ideas about poor cosmetic appearance.

Conclusion

The tense, short-interval sutures placed away from the wound margin during circumcision in order to control subcutaneous bleeding lead to scar wrinkling and a poor cosmetic appearance. Potential of cosmetic appearance to cause medicolegal or psychological problems in advanced ages should be considered. Knowing the risk factors leading to scar wrinkling and taking appropriate measures will provide acceptable cosmetic outcomes after the circumcision.

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