



# Sutureless circumcision using 2-Octyl cyanoacrylate results in more rapid and less painful procedures with excellent cosmetic satisfaction

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## Summary

### Introduction

Circumcision is the most common surgical procedure in male children in the world and is performed because of cultural, religious or medical reasons. Traditionally, interrupted sutures are used to close the wound, but 2-Octyl cyanoacrylate (2-OCA) tissue glue can be used as an alternative method to close the circumcision wound.

### Objectives

To compare the use of 2-OCA with absorbable sutures in circumcision wound closure in prepubescent patients in terms of operative time, complication rate, postoperative pain and cosmetic results.

### Study design

We retrospectively evaluated 662 circumcision procedures using sutures and 609 procedures using 2-OCA for wound closure in prepubescent boys. All circumcision procedures were performed by 2 surgeons in a single centre. Operative time was collected from the hospital surgical software system. 62% of the patients in the suture group and 59% of the patients in the 2-OCA group presented for a postoperative check-up 6 weeks after the circumcision. Data regarding postoperative pain, need for analgesia, cosmetic satisfaction and the ease of wound care were collected through questionnaires completed by 25% of the boy's parents in the suture group and 53% of the parents in the 2-OCA group.

### Results

Mean operative time was significantly shorter in the 2-OCA group (13 min) than in the suture group (17 min). Complications were comparable and mostly minor. Reintervention was only required in 3 cases. According to the parents, the degree of postoperative pain and the postoperative need for analgesics was significantly lower in the 2-OCA group. Wounds closed with 2-OCA were easier to care for. The cosmetic results after 1 day, after 1 week and after 1 month in the 2-OCA group were significantly superior than in the suture group, according to the parents' evaluation.

### Discussion

The use of 2-OCA in circumcision wound closure has been reported before. Previous studies with mainly limited patient numbers report less pain, shorter procedure times and a higher surgeon satisfaction in terms of cosmetic results. This study is the largest study comparing the use of 2-OCA and interrupted sutures in circumcision wound closure.

The retrospective character of the study, the lack of a validated questionnaire tool for the cosmetic evaluation and the use of the parent's evaluation are the limitations of this study.

### Conclusion

The use of 2-OCA in circumcision wound closure results in a shorter operative time, in less postoperative pain, in easy postoperative wound care and in excellent cosmesis when compared to interrupted absorbable sutures. 2-OCA is our current technique of choice in circumcision wound closure.

	Suture	2-OCA	p value
Number	692	608	NS
Age (years), mean	4.28	4.04	0.025
Surgery duration (min), mean	17	13	<0.0001
No of complications	25	18	NS
Cosmetic appearance	4.36	4.76	<0.0001
Postoperative pain, mean VAS	3.94	3.18	0.0034

## Introduction

Circumcision is one of the oldest surgical procedures in male children. Apart from medical reasons, circumcision is performed for religious and cultural reasons in many ethnic and cultural groups around the world. The most common medical reason for circumcision is phimosis. Other medical indications include: recurrent paraphimosis, recurrent UTI, balanitis and penile carcinoma.

Because HIV prevalence and male circumcision prevalence are inversely correlated, as confirmed by meta-analyses of observational studies in 2000 [1] and in a randomised controlled trial in 2007 [2], indications of circumcision have also become public health related. Moreover, circumcised men are less likely to become infected with HPV (Human Papilloma Virus) [3] and to develop penile cancer.

Circumcision is a procedure that can be performed in many different ways and is to be carried out carefully; it is the most commonly performed procedure worldwide. The goal of each method is to achieve the best possible surgical and cosmetic result with the least possible risk of bleeding and complications. Absorbable sutures have traditionally been used to approximate the skin edges of circumcision wounds. Over the last 25 years, however, surgeons have been interested in the use of 2-Octyl cyanoacrylate (2-OCA) tissue glue for the closure of skin wounds. Nowadays, the use of 2-OCA is widely accepted in skin closure [4], but the use of this adhesive is not yet established in circumcision wound closure.

The aim of the present study was to compare the use of 2-OCA glue with sutures in the approximation of wound edges in circumcision, in terms of: operative time, number of complications, postoperative pain, wound care and cosmetic results.

## Materials and methods

The present study was conducted retrospectively. All patients underwent circumcision for religious, cultural or medical reasons. All patients were prepubescent. Data regarding operative times and complication rates were retrieved from the hospital surgical software system. Approximately six weeks after the circumcisions, via questionnaires (a scoring system) completed by the boys' parents, data were obtained regarding postoperative pain, the need for analgesics, ease of wound care, any complications, and cosmetic satisfaction.

Two surgeons performed the surgeries using the same technique. All procedures were performed under general anaesthesia and after application of a dorsal penile block. After disinfection of the operative field, the foreskin was retracted; all smegma and debris from beneath were then removed. After cleaning, the operative field was disinfected again. A circumferential inner incision was made with a scalpel. After haemostasis with monopolar electrocautery, a circumferential outer incision was made at the site that was deemed best for circumcision, followed by the connection of the two incisions, and excision of the foreskin. All bleeding points were carefully addressed with monopolar electrocautery.

In sutured cases, the wound edges were closed using a synthetic absorbable sterile surgical suture polyglactin 910 (Vicryl Rapide 5-zero, Ethicon, US) in interrupted fashion. Finally, antibiotic ointment (a combination of hydrocortison and tetracyclin) (TerraCortril, Pfizer, Belgium) was applied to the circumcision wound and the wound was covered with sterile gauze.

In tissue glue cases, the wound edges were approximated and 2-OCA (SurgiSeal, Adhezion, US) was applied circumferentially. Care was taken to approximate the wound edges in an everted position without creases. The layer of glue dried for approximately two minutes, after which the wound was covered with sterile gauze.

In both sutured and glued cases, the gauze was removed after two to three hours, the wound was verified and patients were discharged. Parents were instructed to apply the antibiotic ointment twice a day during the first postoperative week. Patients were allowed to shower, but not to bath during the first two weeks.

Patients were seen in the outpatient clinic at six-weeks post operation.

Operative times were collected from the hospital surgical software system where anaesthesia and surgery times are registered intraoperatively. All complications were registered at postoperative follow-up in the patient's digital medical chart.

Data for postoperative pain, the need for analgesia, cosmetic satisfaction and the ease of wound care were collected through questionnaires sent to the boys' parents (Fig. 1). Data were statistically processed using the Student's *t*-test and the Mann–Whitney U-test (MedCalc).

## Results

Between January 2009 and October 2011, 662 circumcisions using sutures and 609 circumcisions using 2-OCA (total number of 1271 procedures) were performed. The age distribution in both groups was similar.

The mean operative time  $\pm$ SD was  $17.23 \pm 4.7$  min for sutured cases (range 5–40), and  $13.54 \pm 4.68$  min (range 4–39,  $P < 0.001$ ) using 2-OCA. As a result, the mean total time in the operating room (OR) (time needed for anaesthesia induction, surgery and waking up) was statistically lower in the 2-OCA group than in the suture group ( $25.49 \pm 7.04$  min vs  $30.69 \pm 7.54$ ,  $P < 0.001$ ) (Table 1).

At approximately six-weeks post operation, 416 patients (62%) in the suture group and 361 patients (59%) in the 2-OCA group presented for a postoperative check. Complication rates in both groups were comparable. The number of complications that were recorded in the suture group was 25 (6.00%), whereas there were 18 complications (4.98%) recorded in the 2-OCA group ( $P = 0.08$ ) (Table 2). Most complications were classified as minor complications, as they were managed conservatively. Reintervention was required in only three cases: in one 2-OCA case due to severe postoperative bleeding and in two sutured cases due to unsatisfactory final cosmetic result.

Of the parents of boys treated with sutures, 25% completed the questionnaire, whereas in the case of boys in the 2-OCA group, the response percentage of parents was 53% (Fig. 1 and Table 3). The degree of postoperative pain

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