The Sutureless Circumcision – An Alternative To The Standard Technique

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Abstract : Introduction: Circumcision is a commonly performed surgery. Surgeons have become increasingly interested in the use of adhesive bonds. Recent advances have been made in the use of tissue glu in the circumcision. In this study, we used 2-octul cyanoacrylate for closing circumcision wounds and we have reported our experience. Material & Methods: this was a prospective non-prospective preliminary clinical study involving 30 patients where 2-octyl cyanoacrylate was used as a tissue adhesive for wound closure after formal formal circumcision at of our department. Result: In this study, there is significant less pain. There is 10% (3 cases) of complication are observed. The wound cosmesis score on 90th post-operative day is optimal except in one patient of woud separation. Conclusion: The comparison with criterions of time taken for skin closure [Parekh Z et al NJIRM 2013; 4(3) : 85-89]

Key Words: 2-octyl cyanoacrylate, suture less circumcision, adhesive glue skin closure.

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Introduction: The circumcision is one of the most commonly performed operations, with various recognized techniques. Male circumcision is the removal of some foreskin (prepuce) from the penis[1,2,3.] Procedure include the plastibell with ligature[4], gomco clamp[5], mogen clamp[6] and excision with or without suturing. In last 20 years, surgeons have become increasingly interested in the use and application of adhesive bonds. Recently, advances have been made in the use of tissue glue in circumcision [7]. By undertaking this study, we begun using 2- octyl cyanoacrylate [8,9] for closing circumcisions wounds and here in we have reported our experience. Our aims & objectives are to study if circumcision wounds closure is feasible with topical skin adhesive (2- octyl cynoacrylate), to study complications, cost effectiveness, merits & demerits of the procedure and to assess if the technique can be used as reasonably good alternative to convetional suture circumcisions.

Material & Methods: This was a prospective non-comparative preliminary clinical study involving 30 patients where 2- octyl cyanoacrylate was used as a tissue adhesive for wound closure after formal circumcisions. 30 healthy male patients from the age of 1 year to 25 years, of which most of them were paediatric patients.

There were no exclusion criteria. The indicates for surgery [10] were chronic balanoposthitis, congenital or acquired phimosis, paraphimosis, long prepucial skin, religious reason and others like zip injury. Appropriate blood tests were performed and consent for surgery was taken. The operation was performed under local anaesthesia (dorsal penile block[11, 12]) in the elderly patient while general anaesthesia in the younger patient. The technique of dorsal slit followed by free hand cutting all around with sharp scissors was used in all the cases [13]. The outer layer of the foreskin was retracted back and meticulous haemostasis was achieved. Incision was cleaned after it. The cut edges were approximated with forceps and the glue 2-octyl cyanoacrylate was applied in two thin layers [14]. In some cases suture with 3-0 chromic catgut placed 90degree apart helped the application of the glue between the edges was avoided so that hardened glue does not catch the undergarments. After the procedure was finished, the wound was dried and the time of start of skin closure and the time of finishing the skin closure were noted down using a stopwatch timer. The time taken for skin closure was noted. No liquid or antibiotic ointmwnt applied after glue application. Protective dry gauze applied after adhesive film was completely solid/polymerized (approximately 5 minuts afer application). All the patients received a 5 day course of ampicillin+cloxacillin and analgesic ibuprofen & paracetamol in appropriate doses. Adult were also given oral oestogen tablets.

All the patients were discharged in the same day and followed on the 1st ,5th, 10th,15th,30th, and 90th day. Bathing on the operative site was permitted

after the 5th day onwards. Post-operative pain was assessed at 1st day, 5th day, 10th day.15 day, 30th day and 90th day using Visual Analogue Score [15,16] of 0 to 100, 0 being no pain and 100 being worst pain possible assessed by patients themselves. All wounds were assessed by visual inspection at 1,5,10 days after wound closure. Wound was scored from 0 to 10 according to the proportion of wound involved and presence of serous collection, erythematous changes, purulent exudates and separation of deep tissues (wound ASEPSIS score)[17]. Confirmatory culture was not routinely performed. The modified Hollander Cosmesis Scale(mHCS)[18], a validated scale, was used to evalute at 15th , 30th , 90th day: (1) step-off borders (2) edge eversion (3) contour irregularities (4) excess inflammation (5) wound margin separation (6) overall appearance. A total conmetic score was derived by adding the scores of variables. A score of I was given to each variable if present if present in the wound, so a score of 6 was worst considered as worst while o as best. Any complications or infection, if present were also observed.

Results: The present study is done to observe results of topical skin adhesive (2-octylcyanoacrylate) following circumcision surgery. A total of 30 patients were recruited in the study for three years. The patients were randomly included for using adhesive glue.

In no case, any irritation of skin or any hypersensitivity reaction was observed. No generalized reaction was noted either. No toxicity was observed in any case.

Table 1: Time taken of skin colosure

Non of Patients	Minimum time (seconds)	Maximum time (seconds)	Average time (seconds)
14	80	110	90
7	60	80	70
9	40	80	60

The time taken for skin closure is measured using a stopwatch timer and entered in units of seconds.The skin closure time using 2-oca averaged 90 secs for 1st year,70 secs for 2nd year and 60 secs for 3 rd year reflecting a learning curve associated with application.

Table 2 : Post-Operative Pain Score

Time (day)	Average Visual Analogue score
1st	50
5th	10
10th	0
15th	0
30th	0
90th	0

Generally patients did not feel pain after one week of surgery.

Table 3: Wound asepsis Score

Interval (days)	No complication	Seroma	Erythema	Purulent discharge	Wound sparation	total
1	28 partients	2 Patients	0	0	0	30
5	28 partients	1 patient	0	1 patient	0	30
10	29 partients	0	0	0	1 patient	30

Table 4: Wound Cosmesis score

Time (day)	Score 0	Score 1	Score 2	Score 3	Score 4	Score 5	Score 6
15	27 patient	Nil	1 patient	1 patient	1 patient	1 patient	Nil
30	28 patient	Nil	Nil	1 patient	1 patient	1 patient	Nil
90	29 patient	Nil	Nil	Nil	Nil	1 patient	Nil

Overall 6 patients(20% of total 30 patient) developed wound complications(3 seroma, 2 purulent, 1 wound separation, no patient developed erythema). Wound asepsis score was not on higher side(max4). Wound cosmesis was satisfactory in most of the cases.

Discussion: Now a day surgeons are looking for faster, comfortable and cosmetically best techique for skin closure, more over 2-octyl cyanoacrylate is easier to use and provides a flexible , water resistant. Sealed skin closure [19] 2-0ctyl cyanoacrylate provides a needle-free method of wound closure. An important consideration because of blood-borne viruses (e.g. HIV)[20] It requires no bandaging due to its antimicrobial properties [21] . For the patient side, it gives less pain during post-operative period, need no suture or staple removal, disappears naturally as incision heals, leaves no marks and patients can even have a shower [22].

In the present study, most of the patients (53.33%) were in age group of 1-10 year. It was not signivicant as patients were selected randomly but it can be concluded that circumcision is gegnerally performed in age group 1-10 years. Circumcision was most commonly done for congenital phimosis followed by qcuired phimosis (66.67%)[23] . In one of the first published stusdies evaluating octylcyacrylate, Quin.J.et.al. [24] indicates that use of the skin adhesive is found to be significatly fastre. In Matin S.F. study [25] & in study by James M.Elmore, Edwin A.Smith, And Adrew J.Krirsch [26] it is to be concluded thet skin adhesive technique is significantly faster. In present study. The mean time taken for skin closure in adhesive glue is much faster in last year of the. The study. This is of great significance as it is suggestive thet glue application requires practice ans as experience is gained application becomes easier and faster. In the earlier studies Zempsky W.T.et.al [27] and Quinn J.et.al.[24] have compared the post-operative pain visual analogue scale of 0 to 100 and have show less post-operative pain in adhesive glue group. In the present study, there is less post-operative pain with adhesive glue up to first 5 days following surgery from 10 days on wards there is no pain. Singer A.J et.al. [28] shows that at the end of 1s1 week after surgery were similar and fewer cases of adhesive glue were erthematous. Wounde dehiscence rate is 1.6% in adhesive glue group and 0.9% in suturing group in toriumi D.M. et.al. [29] they had evaluated wound at 1st week and had not observed any complication.In Study Suture Less Circumcision Using 2-octly cyanoacrylate (Dermabond) : appraisal after 18 months of experience by James M.Elmore,Edwin A. Smith and Andrew J.Kirsch[26] no patient developed wound comlication. In present study,10%(3 cases) of complications are observed.There are two seroma (1 purulent) and 1 wound sepration observed. The study conducted by Toriumi D.M[29] et.al. Observed wounds using Modified Hollander Cosmesis Scale And Later By Visual Analogue scale revealed the equivalent result with formal scale and superior result with later scale for wound cosmesis.In study done by jallali N. et.al [30] showed no significant difference in cosmesis with both the score.In present study,wound cosmesis score on post operative 90th day is optimal except in 1 patient of wound sepration.

In comparation with criterions of time taken for skin closure,the post –operative pain,the cosmetic appearance of adhesive glue,2-octyl cyanocylate skin closure is significant better than the traditional skin suturing skin closure[26]

Merits of the procedure

1. The reduced time taken for skin closure resulted in a shorter operative time
2. Forms a flexible, water resistant, sealed skin closure.
3. Faster, comfortable and cosmetically best technique for skin closure, and is easier to use.
4. Practically, the watertight barrier formed by Octylcyanoacrylate allows patient shower anytime after surgery
5. No stitches to be removed.
6. No need to apply bandages.
7. Reduced postoperative pain
8. Disappears naturally as incision heals, leaves no mark.
9. Octylcyanoacrylate is non-irritating to skin and side effects are extremely less.
10. Parental satisfaction great.

Demerits of the procedure

11. Availability of glue in remote areas
12. Short shelf life outside refrigeration
13. Storage problems

14. Cost wise – higher
15. Associated with learning curve
16. However, a randomized controlled trial needs to be done to validate the benefits.

Therefore it can be safely concluded that 2-Octylcyanoacrylate can be used in surgical skin closure in circumcision surgery.

Conclusions: The results from the present study show that the Adhesive Glue, 2-Octylcyanoacrylate skin Closure is reasonably good alternative to traditional skin suturing skin closure.

The concept of a surgical tissue adhesive for superficial skin closure is an attractive alternative to the use of sutures for both Surgeons and Patients.

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