Use Of Topical Skin Adhesive (2-Octyl Cyanoacrylate) Following Circumcision Surgery

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Abstracts: 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 glue in the circumcision. In this study, we used 2-octyl cyanoacrylate for closing circumcision wounds and we have reported our experience. 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 circumcision at surgery department, Smt S.C.L. Municipal General Hospital from May 2008 to Nov 2010. Result: in this study, the mean time taken for skin closure by 2-octyl cyanoacrylate is much faster in last year of study. There is significant less pain. There is 10% (3 cases) of complications are observed. The wound cosmesis score on 90th post-operative day is optimal except in one patient of wound separation. Conclusion: the comparison with criterions of time taken foe skin closure, the post-operative pain, the cosmetic appearance of adhesive glue proves that 2-octyl cyanoacrylate skin closure is significantly better than the traditional skin suturing skin closure. [Parmar H et al NJIRM 2012; 3(5) : 97-101]

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 recognised techniques. Male circumcision is the removal of some or the entire foreskin (prepuce) from the penis[1, 2, 3]. Procedures 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 circumcision wounds and here in we have reported our experience. Our aims & objectives are to study if circumcision wound closure is feasible with topical skin adhesive (2-octyl cyanoacrylate), to study complications, cost effectiveness, merits & demerits of the procedure and to assess if the technique can be used as reasonably good alternative to conventional suture circumcision.

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 circumcision. 30 healthy male patients from the age of 1 year to 75 years, during a period of May 2008 to Nov 2010 in our surgical department, Smt S.C.L.Municipal Medical College comprised the study group. There were no exclusion criteria. The indications 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 90 degree apart helped the application of the glue. The glue was allowed to harden and polymerized. Leakage 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 ointment applied after glue application. Protective dry gauze applied after adhesive film was completely solid/polymerized (approximately 5 minutes after

application). All the patients received a 5 day course of ampicillin+cloxacillin and analgesic ibuprofen & paracetamol in appropriate doses. Adult were also given oral oestrogen tablets.

All the patients were discharged on 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, 15th 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 evaluate 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 cosmetic score was derived by adding the scores of variables. A score of 1 was given to each variable if present in the wound, so a score of 6 was considered as worst while o as best. Any complications or infections, if present were also observed.

Results: Results are tebulated in table Below

Table 1 : Time taken for skin closure

Time period	No of patients	Minimum time (seconds)	Maximum time (seconds)	Average time (seconds)
May 2008 to April 2009	14	80	110	90
May 2009 to April 2010	7	60	80	70
May 2010 to Nov 2010	9	40	80	60

Table 2 Post-operative pain score

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

Table 3 Wound asepsis score

Interval (days)	No complication	Seroma	Erythema	Purulent discharge	Wound separation	total
1	28 patients	2 patients	0	0	0	30
5	28 patients	1 patient	0	1 patient	0	30
10	29 patients	0	0	0	1patient	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	Nil	1 patient	1 patient	1 patient	Nil
30	28 patient	Nil	Nil	Nil	1 patient	1 patient	Nil
90	29 patient	Nil	Nil	Nil	Nil	1 patient	Nil

Discussion: Now a day surgeons are looking for faster, comfortable and cosmetically best technique 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, needs 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 years.it was not significant as patients were selected randomly but it can be concluded that circumcision is generally performed in age group 1-10 years. Circumcision was most commonly done for congenital phimosis followed by acquired phimosis (66.67%)[23]. In one of the first published studies evaluating octylcyanoacrylate, Quin.J.et.al.[24] indicates that use of the skin adhesive is found to be significantly faster. In Matin S.F. study[25] & in study by James M. Elmore, Edwin A. Smith, and Andrew J.Kirsch[26] it is to be concluded that the 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 study. This is of great significance as it is suggestive that glue application requires practice and 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 shown 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 onwards there is no pain. Singer A.J. et.al.[28] shows that at the end of 1st week after surgery were similar and fewer cases of adhesive glue were erythematous. Wound 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 complication. In present study, 10% (3 cases) of complications are observed. There are two seroma (1 purulent) and 1 wound separation 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 post0operative 90th day is optimal except in 1 patient of wound separation.

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

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