

An Observational Study on Adhesive Circumcision

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Abstract: *This study investigates the effectiveness of using N - butyl cyanoacrylate adhesive as an alternative to sutures for skin closure in circumcision procedures. Circumcision, commonly performed for medical and religious reasons, traditionally involves sutures that may lead to increased postoperative pain and potential infection. In this hospital - based, prospective observational study conducted at AL Ameen Medical College, patients undergoing circumcision for various indications were treated with tissue adhesive instead of sutures. Results indicate that adhesive skin closure offers several benefits, including shorter procedure times, reduced postoperative pain, and fewer wound complications, with enhanced cosmetic outcomes noted by the third month and significant improvement by the sixth month. The study suggests that N - butyl cyanoacrylate adhesive is a feasible, safer, and more comfortable alternative for circumcision skin closure, yielding better patient satisfaction and compliance.*

Keywords: circumcision, N - butyl cyanoacrylate, skin closure, postoperative pain, wound cosmesis

1. Introduction

Circumcision is a commonly performed surgery in males all over the world.

Currently one - sixth of the world's male population is circumcised¹, mostly on religious grounds& the incidence of circumcision in the general population is 33%.

The fold of skin (foreskin) covering the glans penis is removed during the circumcision procedure to a point near the coronal sulcus.

Circumcision is mainly indicated in conditions such as secondary cicatricial phimosis, recurrent balanitis / balanoposthitis, balanitis xerotica obliterans (BXO), paraphimosis, painful erection, recurrent urinary tract infection (UTI), ballooning of the foreskin during micturition with complaints and also done on religious grounds.

Circumcision is done in multiple methods such as Dorsal slit method, Mogen clamp technique, Gomco technique and Plastibell technique².

For the technique to be successful it should be easy to perform, address the problem of haemorrhage, avoid the need for interventional postoperative care and give a good cosmetic and functional result.

Haemorrhage and infection are the most common complications, followed by wound separation, recurrent phimosis, preputial adhesions, and unsatisfactory cosmesis due to scar formation.

Ideally suture materials of different types are used for skin closure in most of the surgical procedures.

Recently, alternative wound closure methods have been studied to decrease the complication rate and repair time and to improve the cosmetic outcome and this study focuses on using tissue adhesive for skin closure and its outcome³.

Objectives

To evaluate the safety, efficacy, functional outcome, and cosmesis of N butyl cyanoacrylate adhesive in circumcision procedure.

2. Materials and Methods

Source of data:

All the eligible patients who will undergo Circumcision during the study period were included.

Data collection and evaluation:

It's a hospital based prospective observational study. All the eligible patients who are admitted to AL Ameen Medical College, Vijayapura from November 2022 to October 2023, found to have phimosis, BXO and circumcision on religious grounds were evaluated. Written informed consent of the patient/attender was obtained. A detailed clinical history, physical examination and relevant investigations required for the study were done.

Duration of study: November 2022 to October 2023.

Study Design: Prospective and observational study.

Inclusion criteria:

- Acquired phimosis
- Balanitis xerotica obliterans,
- Previous history of paraphimosis
- Religious and cultural reasons

Exclusion criteria:

- Newborns excluded
- Infants with hypospadiasis
- Patients with bleeding diathesis

3. Technique

All the patients will be personally subjected to detailed history regarding name, age, occupation, socioeconomic status and general physical examination.

Written and informed Consent was taken from all the patients.

All patients were given a single dose of IV antibiotic prior to the procedure.

The procedure was done under dorsal penile block for all patients aged above 10 years of age.

Patients under the age of 10 years were put under general anesthesia and then circumcision was carried out.

Dorsal slit followed by free hand cutting with sharp scissors method of circumcision was employed in all patients.

Bipolar cautery was used at bleeding points especially superficial dorsal vein of penis and frenular artery.

N butyl cyanoacrylate was the glue used instead of suture material.

Two tooth forceps were used to hold two edges of skin and a drop of glue was poured and the edges were approximated swiftly.

For dressing a thin line of antibiotic ointment was applied on a gauze and the same was wrapped around the operated site after adhesive film was completely solid/polymerized

(approximately 5 minutes after application).

All patients were examined approximately 30 min after the procedure to check for any bleeding.

All the patients were given analgesic aceclofenac and paracetamol according to pain.

All patients were discharged in the evening after examination and followed up on 1st day, 3rd day, 7th day, 15th day, 30th day, 3rd and 6th month.

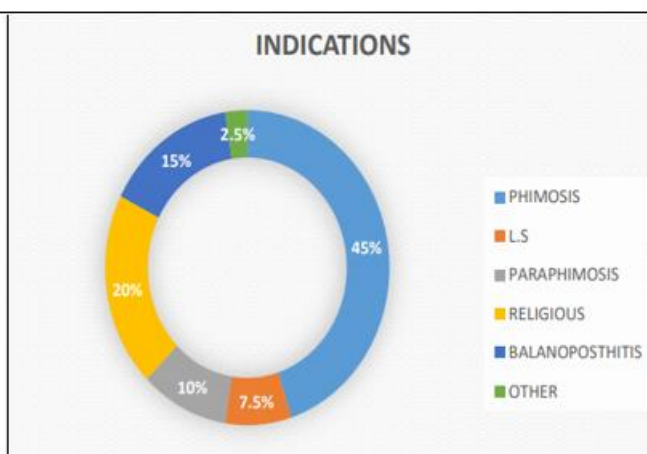
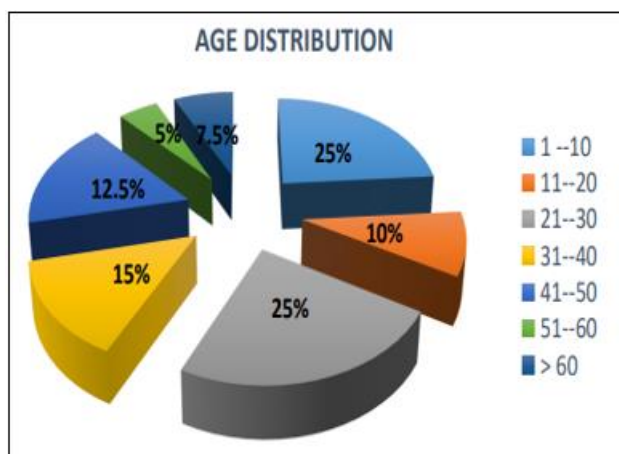
Bathing on the operative site was permitted after the 3 rd day onwards.

Analysis:

Four parameters were studied:

- 1) Time taken for skin closure with skin glue.
- 2) Postoperative wound complications which includes bleeding, excessive swelling, wound infection and wound gaping.
- 3) Postoperative pain studied with Visual analogue scale.
- 4) Wound cosmesis assessed with Modified Hollander scale.

4. Results



1) Time Taken for Skin Approximation

Group	No of Patients	Max time (sec)	Min time (sec)	Average time (sec)
Nov - Feb	14	148	68	104.6
Mar - June	9	96	71	83.5
July - Oct	7	92	58	70.45
Total	30			

	0	1	2	3	4	5	6
1st week	22	3	2	2	1	0	0
1st month	24	4	2	0	0	0	0
3rd month	27	2	1	0	0	0	0
6th month	29	1	0	0	0	0	0

2) Post Operative Pain Score

Time Interval	Average VAS
12th hour	2.5
24hrs	1.07
72hrs	0.32

4) Post Operative Wound Complications

Discussion:

Interval	Bleeding	Swelling	Infection	Gaping	None
Day 1	1	1	0	0	28
Day 3	0	0	3	0	27
Day 7	0	0	0	4	26
Day 15	0	0	0	0	30

Approximation of skin incision in wound closure technique is essential for a good cosmetic and functional result.

3) Wound Cosmesis Score

TIME	Score	Score	Score	Score	Score	Score	Score

The main goal of all wound closure technique is to approximate the wound edges without disturbing the natural process of healing.

Suture material remains standard material for skin closure, but however use of suture material is associated with postoperative pain as sutures inevitably results in tissue damage by puncturing and increases pain of procedure.

Since suture material is associated with puncture site near the wound edge, there is high chance of microbial invasion which in turn leads on to surgical site infection. .

In this study, the skin closure by N - butyl cyanoacrylate adhesive was much feasible than using sutures for skin closure in circumcision procedure.

There is significant less pain ^{4,5}.

Post operative outcome was better in most of the patients except for bleeding and excessive swelling was seen in 1 patient, 2 patients had serous exudates, 3 patients had wound infection and 4 patients had minor wound separation.

The wound cosmesis score on 3rd month is optimal except in 2 patients of wound separation, and perfect score with better results was seen in almost all patients by the end of 6th month.

5. Conclusion

Sutureless adhesive circumcision done using N - butyl cyanoacrylate provided benefits in circumcision surgery techniques such as easy skin closure, prevention of needle stick injury, less intraoperative complication such as excessive bleeding, lesser duration of surgery and better wound asepsis.

It also provides advantage over suture materials in skin closure such as less post operative pain, less wound complications, better cosmetic results and good patient compliance.

Hence the study shows that use of N - butyl cyanoacrylate adhesive can be considered as good alternative for sutures for skin closure in circumcision procedure which has significant advantage over suturing of surgical wound.

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