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### RESEARCH ARTICLE

#### SKIN GLUE AS A EMERGING ALTERNATIVE IN SKIN CLOSURE-A COMPARATIVE STUDY

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#### Manuscript Info

##### Manuscript History

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#### Abstract

**Introduction:** Traditional wound closure techniques include skin sutures and metal clips. The ideal incision closure should be simple, effective, safe, rapid, inexpensive, painless, cosmetic, and bactericidal. Cyanoacrylate glue has good neovascularization, epithelialization, and faster application. It can be considered an alternative for skin closures.

**Methods:** A study was conducted on 50 individuals undergoing elective surgery in the department of general surgery. They were randomized into 2 groups. In group A skin closure was done with skin glue and in group B skin closure was done with sutures. Post-op pain was assessed with VAS and cosmesis was assessed with a modified Hollander cosmesis scale. The time taken for closure was assessed using a stopwatch.

**Results:** Skin closure with skin glue was quicker than traditional closure. The average time for skin closure with glue was 1 minute and 14 seconds while it was 3 minutes and 47 seconds in the suture group. The postoperative pain was comparatively less in people who had closure with glue. Cosmesis was better in patients who had closure with glue compared to sutures. The overall satisfaction level was better in people who had closure with glue compared to those who had closure with sutures.

**Conclusion:** According to this study, using skin glue for skin closure in clean surgery reduces the wound closure time with a superior cosmetic effect. The usage of skin glue can greatly save healthcare expenses and is favored by patients due to the simplicity of postoperative wound care. The study established the efficacy and advantages of this unique technique. The broad adoption of this innovative approach may drastically reduce the need for sutures in clean surgery.

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#### Introduction:-

Skin sutures and metal clips were traditional wound closure techniques. They are safe and effective, although they require instruments to apply them, are time-consuming, and create an extra staff and cost burden for the removal of sutures/staples. The ideal incision closure should be simple, effective, safe, rapid, inexpensive, painless, cosmetic, and bactericidal. Cyanoacrylate has good neovascularization, epithelialization, and antimicrobial activity properties and is a fast application procedure [1,2,3].

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**Aim:-**

The Aim of this study is to evaluate skin glue versus traditional suturing in patients undergoing elective surgery at a tertiary care hospital in Navi Mumbai.

**Objectives:-**

1. To Compare Time taken in patients who had closure with skin glue and traditional suturing
2. To Compare the Post-operative pain in patients who had closure with skin glue and traditional suturing
3. To Compare Cosmesis in patients who had closure with skin glue and traditional suturing

**Patients And Methods:-**

It was a prospective comparative study taken place at a tertiary care hospital in Navi Mumbai for a period of 6 months.

Patient's aged more than 18 years, undergoing elective surgeries, and willing to give consent to participate are included in the study population. Patient's aged less than 18 years, undergoing clean-contaminated, contaminated, infected surgeries, and not willing to give consent to participate are excluded from the study population.

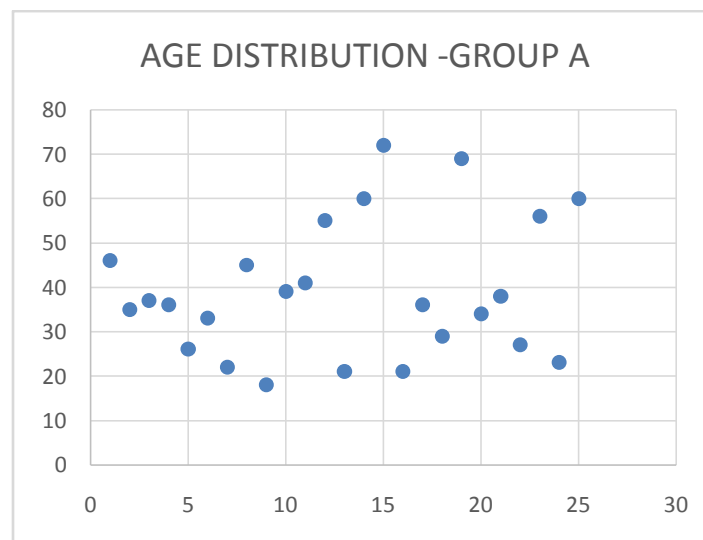
All Patients fulfilling the inclusion criteria were enrolled in the study. All patients received the same antibiotic prophylaxis 30 mins before incision and the normal closure protocol except for skin was followed in both groups.

At the moment of skin closure, the method of closure technique was decided by the chit system picked by the circulatory staff.

Patients allocated in group A were closed using CNA (skin glue). The adhesive was applied over the approximated wound edges in 2 to 3 layers and no further dressing was applied since the adhesive formed a layer giving a protective covering. Those in group B were closed using conventional sutures and sterile dressings applied on the same. Patient outcomes were documented and analysed.

**Results:-**

Fifty patients who matched the inclusion criteria were included in the study after taking due consent and randomly assigned in 2 groups of 25 each and were followed up regularly to assess the outcome and results were recorded and analysed. The mean age of the study in group A is 58 (FIG 1, TABLE 1) and in group B is 41.36. There was a female predominance (60%) in group A and the male predominance (84%) in group B (FIG 3). There were no significant variations in patient demographics between the two groups in terms of age, length of incision, surgical procedures, and hospital stay.



**Fig 1:-** Age Distribution In Group A.

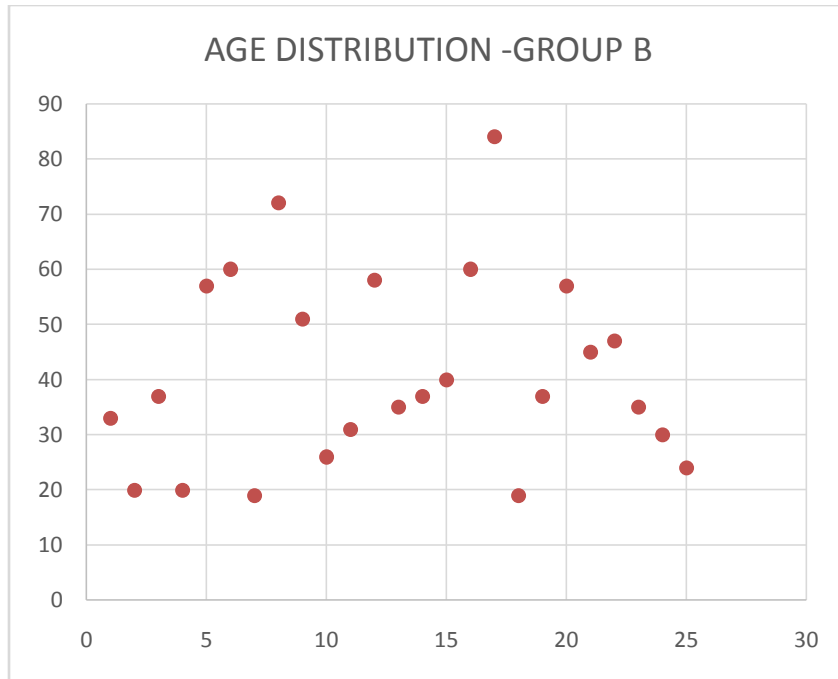


Fig 2:- Age Distribution In Group B.

Table 1:- Mean Distribution In Study Groups.

	MEAN AGE
GROUP A	58
GROUP B	41.36

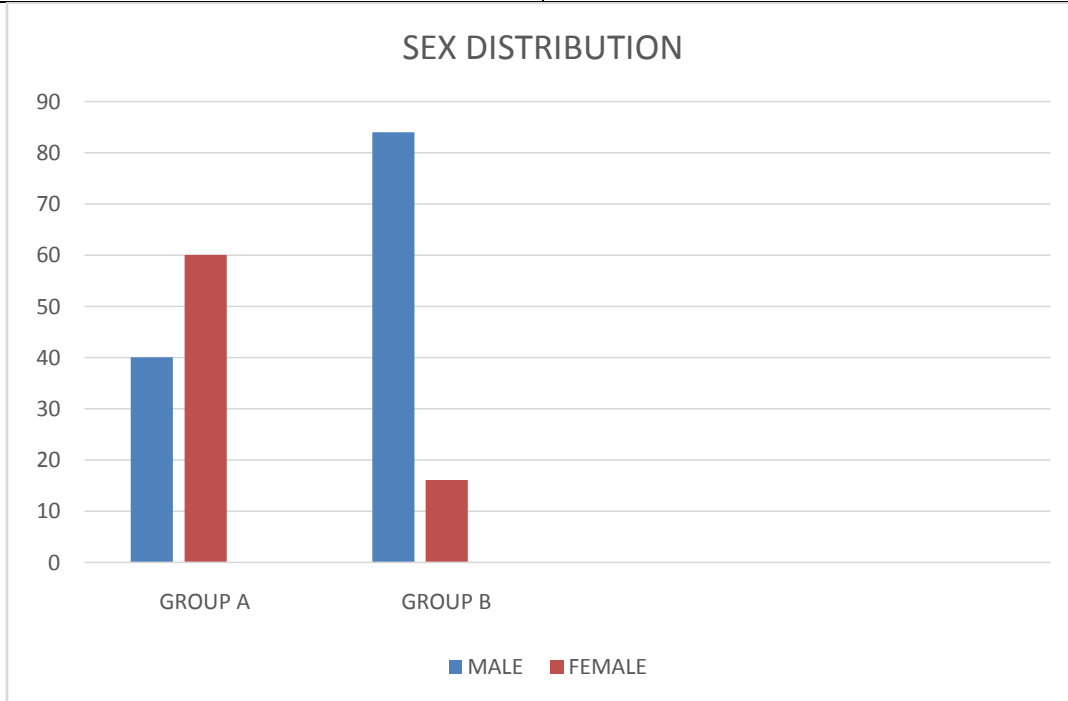


Fig 3:- Sex Distribution In Study Groups.

	MALE	FEMALE
GROUP A	10(40%)	15(60%)

GROUP B	21(84%)	4(16%)
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Table 2:- Sex Distribution In Study Groups.

PROCEDURE DONE	GROUP A	GROUP B
HERNIOPLASTY	8	16
EXCISION BIOPSY	17	9

Table 3:- Type Of Procedures.

Fig 4:- Type Of Procedures.

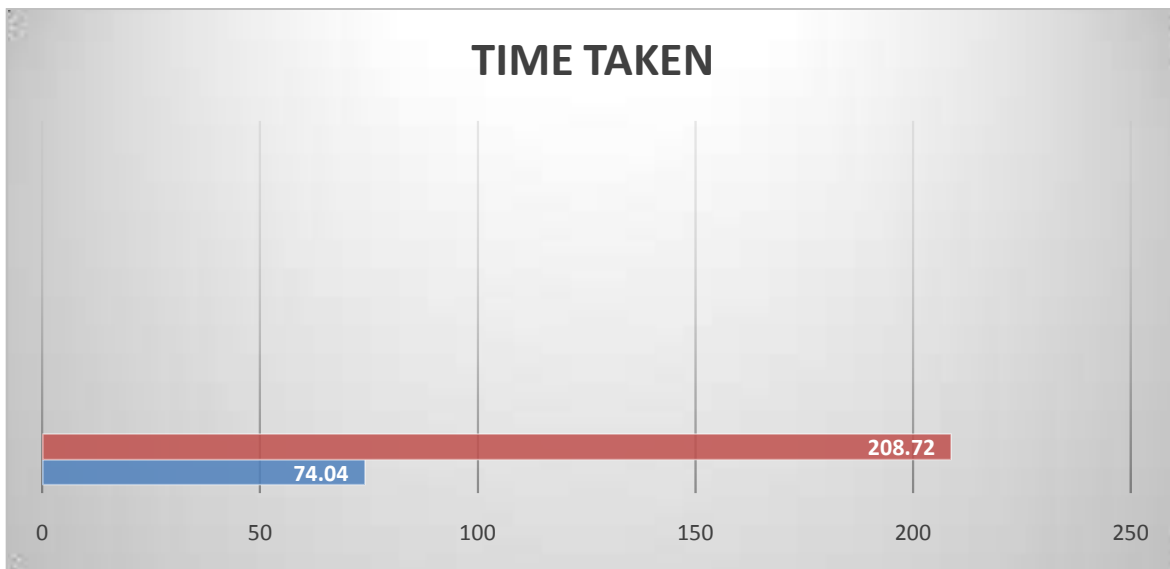
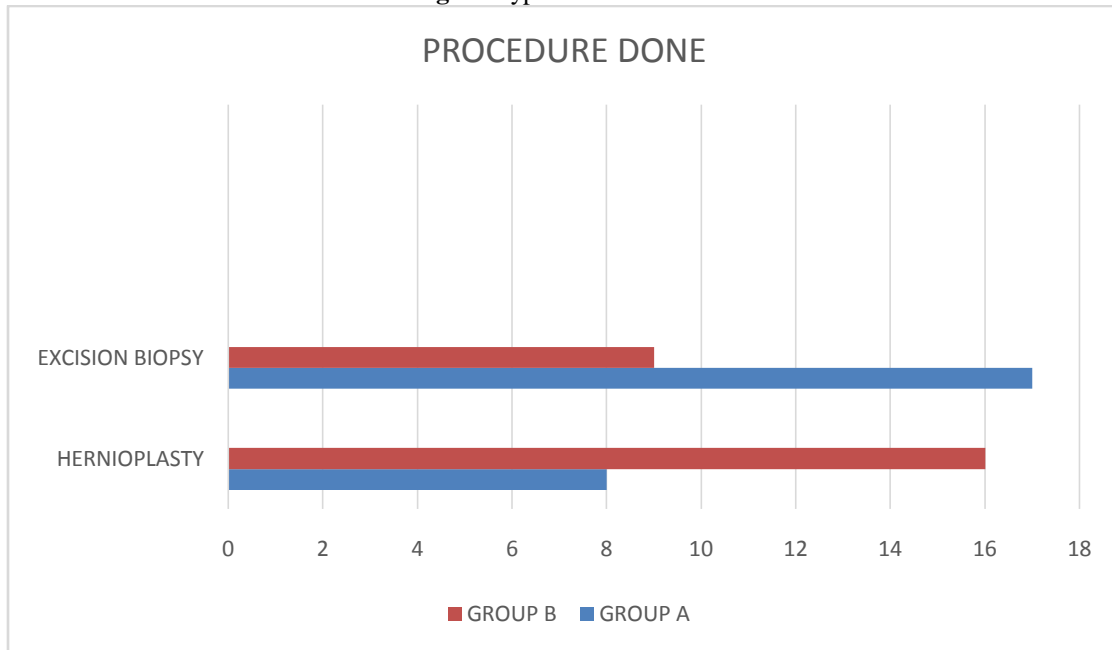


Fig 5:- Time Taken During The Skin Closure.

Skin closure with skin glue was quicker than traditional closure. In group A, the average time for skin closure with glue was 1 minute 14seconds. In group B, the average time for skin closure was 3 minutes and 47 seconds(FIG 5). This difference in skin closure time between the two groups was statistically significant (P.005).

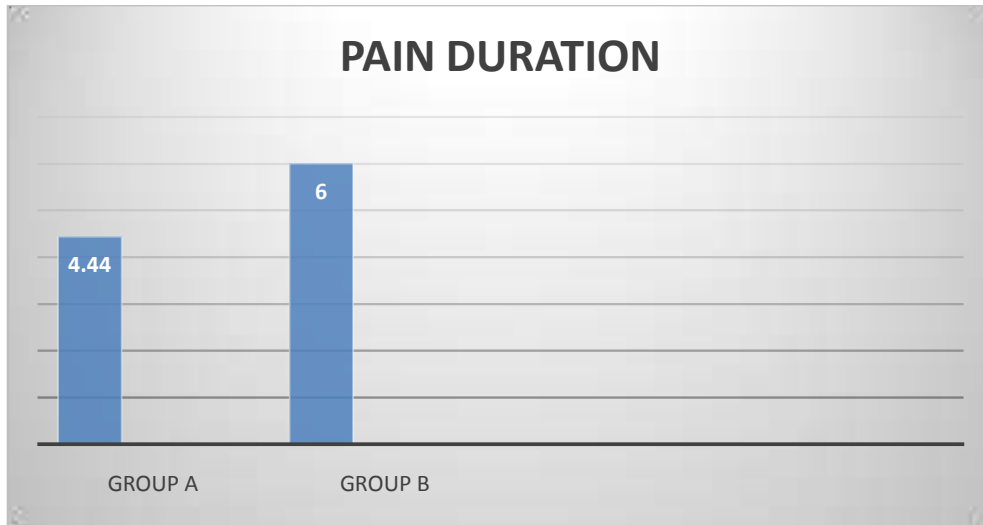


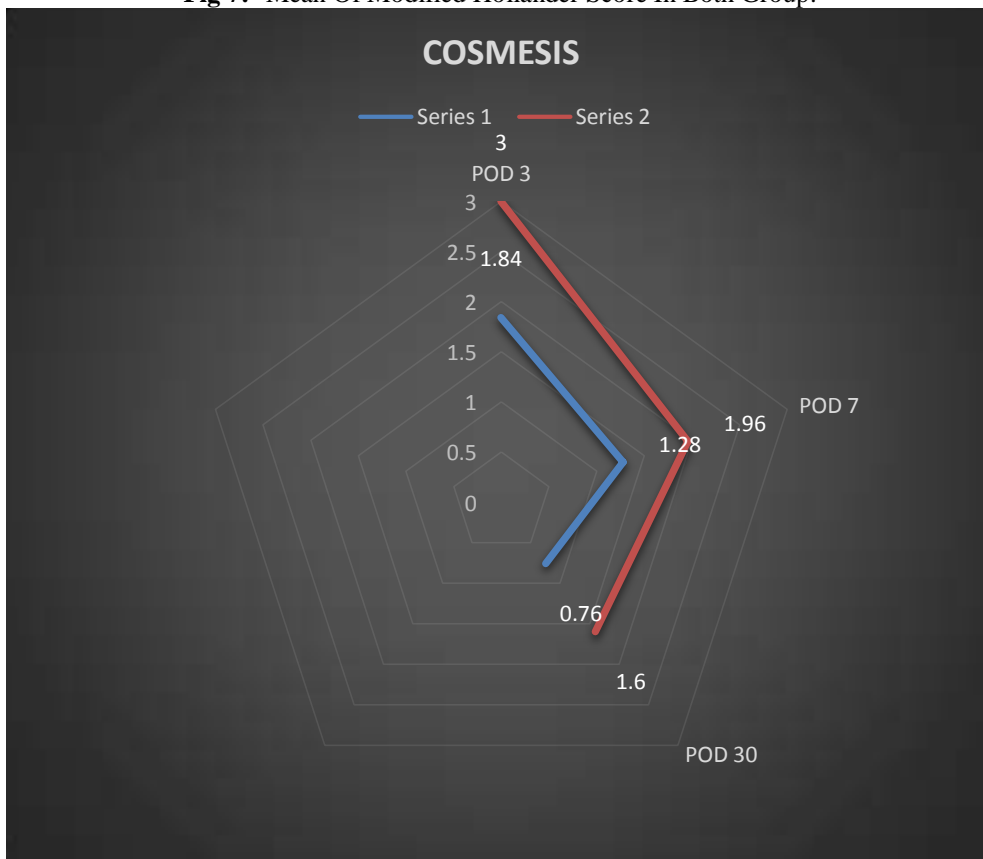
Fig 6:- Pain Duration In Both Groups.

Pain duration differed from person to person (FIG 6). Postoperative pain was predominantly less in Group A compared to Group B. The difference in values obtained by the two groups was not statistically significant.

Table 4:- Mean Of Modified Hollander Scale In Both Groups.

	POD3	POD7	POD30
Group A	1.84	1.28	0.76
Group B	3	1.96	1.60

Fig 7:- Mean Of Modified Hollander Score In Both Group.



In neither category were there no incidences of wound dehiscence, hematoma, or infection. When it came to rating the wounds, clinicians and patients agreed most of the time. Cosmesis is better observed in Group A (skin glue) compared to Group B (sutures) (FIG 8). Patients in the Group A were more satisfied compared to those in the conventional suturing Group B.



**Fig 8:-** Skin Closure with Skin Glue(Group A).



**Fig 9:-** Post operative day 3 sutureline in case of B/L Inguinal Hernia, Right side closed with conventional suturing and Left side closed with Skin Glue.

### **Discussion:-**

The purpose of this study was to determine whether skin adhesive has physical characteristics that make it an effective alternative to sutures in day-to-day practice. The concept of a surgical tissue adhesive for superficial skin closure is a novel concept and an excellent alternative for sutures and staplers.[9,10]

Although suture removal rarely causes pain, these procedures cause significant patient anxiety and many people prefer sutureless surgery. The key advantages of the skin glue (Group A) were the ability to shower after surgery as soon as possible, the absence of stitches, and the absence of bandages. The added benefit was that there was no need for a postoperative visit for dressing, which would have been required if the wounds had been closed with normal sutures.

According to the current study, skin closure using cyanoacrylate glue had better cosmetic effects than conventional suturing.

Adam J Singer et al did research with 814 patients in 2002 had Similar cosmetic outcomes were reported using skin glue in traumatic lacerations,[12], and Maw et al in 1997 conducted a prospective comparison blinded study for the assessment of cosmetic outcomes using skin glue with 26 in head and neck surgery[9],

Mattick et al in 2002 and Ong CC et al in 2002 conducted on pediatric patients, it was concluded that the tissue adhesive is a good "no needle" option. [15,16]

The current study found that administering the tissue adhesive OCA drastically shortened the time required to close skin incisions. The reduced time for skin closure resulted in a shorter surgical time which is important when the patient is undergoing a procedure under local anesthesia or regional blocks. It indirectly minimizes the morbidity

Toriumi DM et al in 1988 and Greene Din 1999 [10,14] also demonstrated that usage of skin glue reduces the closure time by four fold compared to suturing.

Although the Glue application looks very simple, it should be remembered that applying glue in a proper way is a surgical skill which needs precision.

The hemostasis should be adequate and the field should be dry before applying the Glue for a tidy and secure wound closure. The reason for it is the polymerisation process after the glue application is triggered by blood and body fluid quickly, resulting in an unappealing plastic clump on top of the surgical site. Extra precautions should be taken to avoid contamination of wound with skin glue.

### **Conclusion:-**

In this modern era, patients prefer sutureless surgery which is innovative and novel. According to the outcomes of this current study, using skin glue for skin closure in clean surgery dramatically reduces wound closure time with a superior cosmetic effect.

Generally, the usage of skin glue can greatly save healthcare expenses and is preferred by patients due to the simplicity of postoperative wound care. This Study established the efficacy and advantages of this unique wound closure technique. The broad adoption of this innovative approach may drastically reduce the need for sutures in clean surgery.

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