



## ADHESIVE GLUE Vs SUBCUTICULAR SUTURING IN THYROIDECTOMY

## General Surgery

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## ABSTRACT

**BACKGROUND:** Suturing has been the commonest method of surgical wound closure that is being practiced because of good results of skin closure. With adhesive glue being an alternative for skin closure which is less time consuming, comfortable, without the risk of needle prick injury and leaves behind a cosmetically acceptable scar. **OBJECTIVES:** The aim of this study is to compare subcuticular suturing versus adhesive glue for skin closure in thyroidectomy with respect to clinical outcome which included postoperative pain, wound complications, wound dehiscence and cosmesis. **MATERIAL AND METHODS:** This prospective study of 100 cases of skin closure using subcuticular suturing versus adhesive in thyroidectomy was carried out at BGS Global institute of medical science and Hospital, Bangalore with the aim of comparing suturing versus adhesive glue, with respect to clinical outcome which included postoperative pain, wound complications, wound dehiscence and cosmesis. **RESULT:** 100 patients divided into 2 groups, randomly underwent subcuticular suturing and adhesive glue skin closure. Post-operative pain was less in glue group (p value <0.001) and wound complications were comparable in both groups. **CONCLUSION:** Octylcyanoacrylate provides an effective and reliable means of skin closure and yields similar cosmetic results as with subcuticular skin sutures. The incidences of wound complications are comparable in both the groups. However the severity of postoperative pain is lesser in the adhesive group.

## KEYWORDS

Subcuticular suturing, 2-octylcyanoacrylate, adhesive glue, stony brook scar evaluation scale.

## INTRODUCTION

Wound care in its simplest form is based on the knowledge, evolved along with the evolution of mankind. The recorded history of wound closure is as old as that of medicine. The Edwin Smith Surgical Papyrus, written in Egypt during the 7th century BC, is a historical document as it contained materials dating back to 2500 to 3000 BC. This was the first document to mention surgical suturing in the passage interpreted "Thou shouldst draw together for him his gash with stitching".

Techniques of wound closure have evolved a great deal from the earliest development of suture materials. These evolutions have provided us with a variety of suture materials, staples, tapes and adhesive Compounds. The greatest progress in wound suturing was noted after World War II with the introduction of advanced semiautomatic staplers and with the manufacture of synthetic nonabsorbable and absorbable sutures.

A new technique that has been developed for closure of surgical wound is the use of surgical adhesives. Cyanoacrylate provides the patients with the option of sutureless skin closure and its use is fast catching up. Cyanoacrylates can be synthesized by reacting formaldehyde with alkyl Cyanoacetate to obtain a prepolymer which by heating, is depolymerized into a liquid monomer. A key property of cyanoacrylates is that the monomer liquid actually polymerizes directly on the surface where it is applied, creating a high quality and very tenacious polymer film. Cyanoacrylates typically fix within a minute and achieve full bond strength in 24 hours. This stronger flexible bond may allow its use on longer incisions<sup>1,2</sup>. Animal studies suggest its tensile strength to be superior to adhesive tape strips, equivalent to subcuticular suturing but inferior to skin staples and its use in higher tension wounds is not recommended<sup>2</sup>.

In traditional skin closure with suture material, patients experience more pain during post-operative period and patients have to come for suture removal. Even after healing suture track marks can be seen. Chances of wound infections are higher with skin suturing than with closure using tissue adhesive. The cyanoacrylates can be used safely in clinical practice with no reports of adverse effects or carcinogenicity<sup>3</sup>. On the other hand 2octylcyanoacrylate is easier to use and provides a flexible, water resistant, sealed skin closure<sup>4</sup>. 2Octylcyanoacrylate gives a cosmetically better outcome than with needle skin suturing. 2octylcyanoacrylate provides a needle free method of wound closure, an important consideration because of blood borne viruses (eg. HIV). It requires no bandaging due to its antimicrobial properties. Advantages with the use of glue are: gives less pain during the post-operative period, patients can have a shower as early as the next day needs no suture or staple removal, disappears naturally as incision

heals without leaving a mark<sup>4</sup>.

## OBJECTIVES OF THE STUDY:

To compare isoamyl-2-cyanoacrylate with skin stapling for skin closure in thyroidectomy for cosmetic outcome, wound dehiscence, wound infection and severity of post-operative pain.

## MATERIALS AND METHODS:

The study was a prospective study conducted in BGS Global institute of medical sciences, Bangalore Karnataka from January 2018 to December 2020.

The study was conducted on 100 patients in the department of general surgery. The patients undergoing thyroidectomy were chosen and divided into two random groups. Age group of the study population was 18yrs-60yrs. Preoperative antibiotic (Injection Ceftriaxone 1g) was given to all patients.

Subcuticular suturing for skin closure was done in one group and tissue adhesives (Isoamyl-2 cyanoacrylate) in the other. For all patients, subcutaneous sutures were applied to relieve tension, close dead space and appose wound edges. In order to approximate the two edges of the incised wound, the two ends of the wound was held, stretched using forceps and the adhesive was applied in a single layer.

Evening dose of same antibiotic and injection paracetamol TID was given for first 24hrs postoperatively. During the postoperative period patients were assessed for pain at 24h using the visual analogue scale, incidence of wound infection and wound dehiscence. During the first follow up patients were assessed for the incidence of infection and wound dehiscence. Infection was defined as the presence of pus with positive microbiological culture. Wound dehiscence was defined as partial or complete wound gaping. Cosmetic outcome was assessed after 3months using the Stony Brook scar evaluation scale.

Table-1 Stony Brook Scar Evaluation Score

SCAR CATEGORY	NO. OF POINTS
<b>WIDTH</b>	
>2mm	0
<2mm	1
<b>HEIGHT</b>	
Elevated/depressed	0
Flat	1
<b>CONTOUR</b>	
Darker than surrounding skin	0
Same colour or lighter	1

<b>HATCH MARKS/ SUTURE MARKS</b>	
Present	0
Absent	1
<b>OVERALL APPEARANCE</b>	
Poor	0
Good	1

**DATA ANALYSIS:**

t test was used to compare the postoperative pain mean scores and cosmesis mean score between the two groups.

Chi-square test was used for the association of wound dehiscence between two groups. Fischer exact test was used for the association of Wound infection between the two groups. p value <0.05 was considered statistically significant.

**RESULTS AND DISCUSSION:**

In our study of 100 patients, 13 patients were male and 87 were female patients with mean age for the adhesive group was 35.73 +14.27 and for the sutured group was 37.66 + 10.45.

Mean post-operative pain score was 6.31 in sutured group and 5.49 in adhesive group with p value of <0.001. Wound dehiscence was seen in 3 patients. All 3 belonged to the adhesive group. 2 were noticed during the postoperative period and 1 during the first follow up. All 100 patients came for the first follow up. No evidence of wound infection was noted during our study.

93 patients (48 in adhesive group, 45 in suture group) came for the 3rd month follow up. Wounds of patients in both the groups were assessed for cosmesis using the Stony Brook scar evaluation scale which has 5 parameters. A total cosmetic score was derived by adding the scores for each variable. A score of 4 and 5 was considered as optimal, score of 3 or lesser was suboptimal. It was observed that the mean cosmesis score at the end of three months for adhesive and subcuticular suturing group is 4.0 and 3.85 respectively (P=0.57) which was not statistically significant. In a study conducted by Jallali N. et.al showed no significant difference in cosmesis<sup>5</sup>. Adam J. Singer et al. also concluded that there was no statistically significant difference in the cosmetic outcome between the two groups<sup>6</sup>. Li-Ying Teoh. et.al also concluded that Tissue adhesive offers a comparable cosmetic result to the absorbable suture in thyroidectomy wound closure<sup>7</sup>. M. Alicandri-ciuffell et al concluded that at 3 months, there were no differences in aesthetic outcomes between groups in subcuticular suturing versus glue application<sup>8</sup>.

Suturing has been the commonest method of surgical wound closure with good cosmesis but with adhesive as an alternate option for skin closure which is less time consuming, comfortable, without the risk of needle prick injury and leaves behind a cosmetically acceptable scar.

2-octyl cyanoacrylate provides a flexible, water resistant, sealed skin closure with antimicrobial properties hence reducing the need for frequent wound dressings. As it provides a water resistant closure, the patients can have a bath as early as the first postoperative day.

There are several limitations to this study. Patients were not randomized and this may have led to undetected bias in the assignment of the type of closure. However the study was performed prospectively using consecutive patients, all considered appropriate for wound closure by either method. Secondly no uniformity in analgesics after 24hrs of surgery. Another drawback was not all patients could be followed up for assessing the incidence of wound complications and cosmetic outcome. The cost analysis was not done for the patients and also the length of hospital was not recorded.

At the end of the discussion we can conclude that adhesives leave behind a cosmetically acceptable scar, lesser postoperative pain and with the same incidence of wound complications. In addition adhesives have a few more practical advantages such as (i) they form a water resistant barrier allowing the patients to have shower .(ii) No need to apply dressings. (iii)No need for suture removal.

**CONCLUSION:**

Octylcyanoacrylate provides an effective and reliable means of skin closure and yields similar cosmetic results as with subcuticular skin sutures. The incidences of wound complications were comparable in both the groups. However the severity of postoperative pain is lesser in the adhesive group. In addition octylcyanoacrylate provides certain

practical advantages to the patients. The advice as to which method is used for closure of wound may come down to economics and operator preference.

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