

# **Comparative Study Of Subcuticular Sutures And Adhesive Glue For Elective Thyroid Surgeries: Single Institutional Study.**

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## **Abstract**

### **Background**

*In thyroid surgery neck mobility post-operatively and aesthetic scars are crucial factors in outcomes after incision in front of the neck for thyroid Surgeries. This randomised, blinded study compares these subcuticular sutures and skin glue in incision closures using tissue glue.*

*Aim: To compare the efficacy of sutures vs surgical glue in thyroidectomy scars in elective thyroid surgeries.*

### **Patients And Methods**

*In this prospective randomised blinded comparative study, on 50 patients who underwent thyroidectomies using a collar line incision were randomly selected to receive tissue glue for skin incision closure. The time for skin closure was recorded and mobility of the neck was assessed using a visual analogue scale at 48 h and 1 week after surgery. At the delayed review after 6 weeks, the cosmetic appearance will be assessed using a linear 1–10 visual analogue scale by the patient, surgeon, and an independent blinded assessor not involved in the surgery. Results will be compared using appropriate statistical analysis.*

## **Results**

*Surgical Glue (n = 25) and suture (n = 25) closures were performed for hemithyroidectomy (n = 8 versus 6), subtotal thyroidectomy (n = 12 versus 18), total thyroidectomy (n = 1 versus 4) Skin closure with tissue glue took significantly longer duration than with staples (mean, 95 versus 28 s; P < 0.001). Neck mobility scores were comparable at initial assessment at 48 h and 1 week (mean, 4.8 versus 4.4; P = 0.552; and 2.7 versus 2.6; P = 0.886). Quality in terms of appearance at 6 weeks was comparable when the patient (mean, 1.7 versus 1.8; P = 0.898), surgeon (mean, 2.6 versus 2.3; P = 0.633) and independent assessment (mean, 1.4 versus 1.9; P = 0.365) were performed.*

## **Conclusions**

*The application of glued skin closure may take a relatively longer duration post-surgery but acceptable neck mobility and aesthetic scars can be achieved by the stapled application which could be faster with equally good cosmetic scars with patient satisfaction.*

**Keywords:** *Thyroidectomy incision, wound closure, Skin staples, Tissue glue, aesthetic scars*

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Date of Submission: 27-01-2025

Date of Acceptance: 07-02-2025

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## **I. Introduction:**

The skin closure technique, especially in the head and neck region, should be simple, aesthetic, cost-effective and less time-consuming. Till the last decade, Sutures remain the mainstay of thyroidectomy scars. Even in suburban hospitals, tissue adhesive has now become more used.<sup>1</sup> A good-looking post-operative scar and neck mobility are important outcomes following thyroidectomies. Surgeons' choice and pathology and the cost of the procedure influence the methods of skin closure, concurred by many researched articles and meta-analyses<sup>3</sup>. Common skin closure methods include the use of skin staples and tissue glues. These two closure techniques have been compared and evaluated in randomised clinical trials. Tissue approximation is the basic requirement for skin closure, and the operating surgeon needs to have the scar, which is acceptable to the patients. Despite various suture techniques and suture materials effectiveness, patients may still experience postoperative pain and wound infections, though better cosmetic results and shorter hospital stays are still possible.<sup>4</sup> The surgical glue with cyanoacrylates gained popularity recently in the developing world as a powerful, quick-drying glue with an acceptable scar. It was found that cyanoacrylate glue, when opened to the atmosphere, had a remarkable healing capacity to keep wounds closed<sup>5</sup>. This blinded, randomised, controlled trial seeks to address this by comparing the neck mobility and cosmetic results of thyroidectomy incision closure using tissue glue or skin staples.

## **II. Materials And Methods**

A prospective comparative study of 50 elective thyroidectomy patients was randomised by simple randomisation into two groups of 25 each. 50 patients of both sexes in the adult age group 18-60 years were included in the study. Patients with co-morbidities, malignant goitres, and recurrent cases were excluded from the study. This study was conducted for a period of one year from January 2023 to December 2023 at the Department of General Surgery, Karpaga Vinayaga Institute of Medical Sciences and Research Centre

## **III. Statistical Analysis:**

In the study group, the skin was closed with subcuticular sutures(n=25), or with surgical glue(n=25). Patients in both groups were given IV antibiotics seven postoperative days. The subcuticular sutures were removed after 10 days, and pain on removal was recorded using VAS. Staples. Patients were assessed daily in the immediate postoperative period until the day of suture removal, and subsequently 15 and 30 days after the suture removal for wound cosmesis, by an independent observer and, complications. The data obtained in the study was tabulated under two groups assigned to each of the wound closures with suture material and surgical glue used in the study.

## **IV. Results**

The study included a total of 50 patients divided into two groups of 25 each. A total of 22 males and 28 females. In the subcuticular suture group, 10 males and 15 females were there with a mean age of  $50.6 \pm 8.4$  years and range between 37 and 65 years with 24 patients (48%) in the age group of 35–45 years, 20 patients (44 %) in the age group of 46–55 years and 6 patients (12 %) in the age group of 56–65 years.

The mean time taken for skin closure and it can be observed that the meantime taken for skin closure in the adhesive group is  $2.72 \text{ minutes} \pm 1.32$  and that of the suture group is  $4.88 \text{ minutes} \pm 1.534$  (Table 1) The student 't' test was used to determine whether there was a statistical difference between the sutures and glue group in terms of post-operative time (Table 1)

**Table 1.**

Time for Closure	Suture Group	Glue Group	
Mean	4.88	2.72	
SD	1.534	1.325	
t' value	7.534		
P' value	<0.001 Significant		

In all the above tests, P values less than 0.05 were taken to be statistically significant. The data was analysed using the SPSS package

The time taken for closure was calculated (in min) beginning from the placement of the first skin staple or suture to the completion of the last and time from the application of surgical glue. The total length of the incision (in cm) in the immediate postoperative period by using a silk thread and aligning it along the incision lines. Pain was evaluated in the postoperative period for both groups using a visual analogue scale and the aesthetic outcome of the wounds was compared on the seventh post-operative day, then on 15 and 30 days after the removal by an independent blinded observer as poor, moderate, or good. Patient comfort was measured by asking for difficulty in movement of the neck using VAS having the same scale.(Table 2)

**Table :2 Post operative pain assessment**

It is observed patients with skin glue have lesser postoperative pain in glue than suture group.

POSTOPERATIVE PAIN (Time)	Suture group		Glue group		T value	P value
	Mean	SD	Mean	SD		
12 hs	5.46	3.74	3.74	0.525	11.08	<0.001
24 hrs	4.74	0.571	3.26	0.527	11.07	<0.001
48 hrs	4	0.606	2.76	0.576	11.374	<0.001
7 days	3.14	0.535	2.2	0.404	9.915	<0.001
30 days	2.24	0.476	1.32	0.513	9.295	<0.001

The quality of the scar looked aesthetically better with little discomfort to the patient than with surgical glue group.

### V. Discussion:

There are a numerous choices of skin closure using a different qualities of suture materials from absorbable and non-absorbable and different ways of suturing from simple, continuous, and subcuticular.<sup>6</sup> The choice of skin incision closure technique influences the outcome of aesthetic scar and neck mobility in terms of functional neck mobility. In the last few decades, the use of surgical glue in neck incision even in developing countries has turned out to be an effective alternative<sup>7</sup>. The active ingredient in surgical glue is octyl cyanoacrylate improvised from earlier generation glue, earlier generation with the use short carbon atoms, which makes the surgical glue works better in approximation of wound and relatively faster in degradation in comparison with the toxic suture material.<sup>8</sup> This also eliminates the chance of needle stick injuries, relatively less time for the application of the glue material and minimal or no chance for surgical site infections.<sup>9</sup> The suture materials on the other hand, despite the relatively longer time taken to apply subcuticular sutures, the tensile strength is appreciable. Tissue glue which contains cyanoacrylate are topical adhesive glues that creates bond in opposing edges, as it contains long chain plasticizer which helps in forging very strong flexible bond. quin.J.et al, in their similar research study documented on octylcyanoacrylate as an alternative for sutures documented the use of adhesive glue was found to be significantly more effective with a p value of <0.001, considered significant.<sup>10</sup> The mean time taken for adhesive glue is 4.88 minutes ±1.53 and for skin suturing group the meantime taken is 2.72 minutes ±1.32. This difference in minimum time taken of skin closure for adhesive group if great significant with p value <0.001. In comparing the postoperative pain for both skin glue and subcuticular suturing is compared at 0hrs, 12hrs, 48hrs, 72hrs included the choice of suture material used and the time taken for completing either subcuticular suturing and application of tissue glue. <sup>11</sup>. The factors need to be considered in making a comparison of these two methods of wound closures, the ease of application, time taken for completion, post operative pain, and the appearance of the scar. In our study compared to other similar study the surgical glue scar looked aesthetically better with little discomfort to the patient.

### VI. Conclusion:

The present study was done to compare the skin closure technique with tissue adhesive skin glues and subcuticular suturing for elective thyroid surgeries. Tissue glues skin closure for incisions like neck, where there is more need of neck mobility, skin glue is superior to subcuticular suturing due to following properties in terms of ease of application and aesthetically better scar. Time for application of skin closure is relatively shorter compared to subcuticular suturing which in turn reflects on operating time in addition to waterproof and cosmetically better scar.

Acknowledgements: Nil

Conflicts of Interest: Nil

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