Indian Journal of Basic and Applied Medical Research; December 2020: Vol.-10, Issue- 1, P.432 - 436
DOI: 10.36848/IJBAMR/2020/88215.55849

Original article:

A STUDY ON COMPARISON OF SUBCUTICULAR SUTURING AND TISSUE ADHESIVE -2-OCTYL CYANOACRYLATE FOR SKIN CLOSURE IN THYROIDECTOMY AT RGGGH, CHENNAI

Dr.M.Kamalraj *

M.S.,General Surgery, Senior Assistant Professor, Madras Medical College &RGGGH, Chennai - 600003
Corresponding author*

Abstract:

Introduction: Thyroid surgeries are one of the most commonly performed surgeries by a general surgeon. Surgery in this region also raises significant aesthetic problems as the neck region is easily visible to other people and therefore it is very important.

Methodology: In our observational study, Patients undergoing total thyroidectomy and hemi thyroidectomy in RGGGH, Chennai were included. Study was conducted at Institute of General surgery , Rajiv Gandhi Government General Hospital, Chennai.

Results: The Time Taken for Closure between Closure by Unpaired t-test were t-value=15.141, p-value=0.0005<0.01 which shows highly statistical significance difference at $p < 0.01$ level. The Time for Surgery between Closure by Unpaired t-test were t- value=5.813, p-value=0.0005<0.01 which shows highly statistical significance difference at $p < 0.01$ level.

The Post Operative Pain1 between Closure by Unpaired t-test were t-value=22.501, p-value=0.0005<0.01 which shows highly statistical significance difference at $p < 0.01$ level. The Post Operative Pain 3 between Closure by Unpaired t-test were t-value=14.135, p-value=0.0005<0.01 which shows highly statistical significance difference at $p < 0.01$ level.

Conclusion: This study was conducted to compare skin closure techniques with tissue adhesives and skin sutures. The concept of tissue adhesive is superior to skin suture due to the following properties, Faster, comfortable and cosmetically better, Time taken for skin closure is shorter which in turn reduces operating time, It provides flexible, water resistant and sealed skin closure , It forms water tight barrier and allows the patient to take shower at any time.

Keywords : Subcuticular suturing , hemi thyroidectomy , neck region

Introduction:

Thyroid surgeries are one of the most commonly performed surgeries by a general surgeon. Surgery in this region also raises significant aesthetic problems as the neck region is easily visible to other people and therefore it is very important. These surgeries classically require anterior neck incisions that are at the risk of undesirable aesthetic results when the scars do not form as expected. Moreover these surgeries are practiced in young woman and incidence of thyroid disease is three times more common in women than men. Also incidences peaks in third and fourth decades of life. For all these reasons the cosmetic outcomes of this kind of surgery is very important.

Various skin closure techniques like Sutures, tapes, staplers and tissue adhesive glue are available to achieve cosmetically better scar. Skin closure should be safe, pain free and to achieve better scar. There are various

methods of skin closure which include Suture materials, staplers, tapes and tissue adhesive glue. The 2- octyl cyanoacrylate adhesive glue is used for various applications like tissue adhesion, hemostasis, closure of CSF leaks, vascular embolisation , application of skin grafts and skin closure. So, this study is designed to study and compare the efficacy of tissue adhesive with subcuticular suture in thyroidectomy.

Methodology:

In our observational study, Patients undergoing total thyroidectomy and hemi thyroidectomy in RGGGH, Chennai were included. Study was conducted at Institute of General surgery , Rajiv Gandhi Government General Hospital, Chennai.

Any case of Total thyroidectomy and Hemi thyroidectomy excluding the patients with diabetics, malignancy, recurrence, risk of keloid formation, allergic to cyanoacrylate and bleeding disorders.

INCLUSION CRITERIA:

All patients undergoing Total thyroidectomy and Hemithyroidectomy.

EXCLUSION CRITERIA:

- Diabetic
- Patient undergoing total thyroidectomy for malignancy with neck dissection/recurrence/partial excision
- Known bleeding diathesis
- Known personal and family history of keloid formation or scar hypertrophy
- Known allergy to cyanoacrylate or formaldehyde

Data collection: Data regarding History, surgery done and outcome

Results:

The Age distribution were <30 years is 23.3%, 31-40 years is 25.0%, 41-50 years is 28.3%, 51-60 years is 21.7%, >60 years is 1.7%. The Gender distribution were Female is 93.3%, Male is 6.7%. The Age between Closure by Pearson"s Chi-Square test were □2=4.934, p=0.294>0.05 which shows no statistical significance between Age and Closure.

The Gender between Closure by Fisher"s exact test were □2=1.071, p=0.612>0.05 which shows no statistical significance between Gender and Closure.

The Diagnosis between Closure by Pearson"s Chi-Square test were □2=0.739, p=0.390>0.05 which shows no statistical significance between Diagnosis and Closure.

The Procedure between Closure by Pearson"s Chi-Square test were □2=0.089, p=0.766>0.05 which shows no statistical significance between Procedure and Closure.

The Time Taken for Closure between Closure by Unpaired t-test were t-value=15.141, p-value=0.0005<0.01 which shows highly statistical significance difference at $p < 0.01$ level.

The Time for Surgery between Closure by Unpaired t-test were t- value=5.813, p-value=0.0005<0.01 which shows highly statistical significance difference at $p < 0.01$ level.

The Post Operative Pain1 between Closure by Unpaired t-test were t-value=22.501, p-value=0.0005<0.01 which shows highly statistical significance difference at $p < 0.01$ level.

The Post Operative Pain 3 between Closure by Unpaired t-test were t-value=14.135, p-value=0.0005<0.01 which shows highly statistical significance difference at p < 0.01 level.
The Stony Brook Scar Evaluation Scale1 between Closure by Unpaired t-test were t-value=17.954, p-value=0.0005<0.01 which shows highly statistical significance difference at p < 0.01 level.
The Stony Brook Scar Evaluation Scale 3 between Closure by Unpaired t-test were t-value=18.373, p-value=0.0005<0.01 which shows highly statistical significance difference at p < 0.01 level.

Table 1: Comparison of Procedure between the Closure by Pearson's Chi-Square test

			Closure		Total	□2 - value	p-value
			Suture	Glue			
Procedure	Hemi Thyroidectomy	Count	7	8	15	0.089	0.766 #
		%	23.3%	26.7%	25.0%		
	Total Thyroidectomy	Count	23	22	45		
		%	76.7%	73.3%	75.0%		
Total		Count	30	30	60		
		%	100.0 %	100.0 %	100.0 %		
# No Statistical Significance at p > 0.05 level							

Discussion:

The main goal of all wound closure techniques is to approximate the edge of the wound without interfering the natural healing process. Traditionally, skin closure technique was performed with suture material because of cost-effectiveness and availability. But current trend runs towards a faster, comfortable and cosmetically better technique. Suture material remains standard material for skin closure, but however use of suture material is associated with postoperative pain and one have to come for suture removal which in turn causes anxiety or pain. 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.

Needle stick injury is highly associated with suture material and hence there is high chance of transmission of HIV and other diseases. Despite all shortcomings of suture material technique, it still retains the maximum tensile strength. In one of the published studies of 2-octylcyanoacrylate of quin.J.et al, use of adhesive glue was found to be significantly faster (220 seconds versus 744 seconds ; $p<0.001$). In MATIN.S.F study, the mean time taken for skin closure in adhesive glue group is faster than skin suturing group (150 seconds versus 360 seconds). In the present study, the mean time taken for skin closure is studied in minutes. The mean time taken for adhesive glue is 4.20 minutes ±1.53 and for skin suturing group the mean time taken is 8.03 minutes ±1.32. This difference in minimum time taken of skin closure for adhesive group if great significant with p value
<0.001.

The postoperative pain for both skin glue and skin suturing is compared at 1st week and 3rd week of postoperative day. Postoperative pain is assessed using visual analogue scale. In the present study it is observed that postoperative pain is less. several studies such as Quin.J. et al have compared postoperative pain and shown that less postoperative pain in adhesive glue group but of no significance. In the present study it is seen that postoperative is less with skin glue group than with suturing techniques. This difference is of great significance with p value <0.001.Postoperative scar following skin closure with adhesive glue and skin suturing is studied using stony brook scar evaluation score. The SBSES has five parameters like width of the scar, Height of the scar, color, Hatch marks/suture marks and overall appearance . Score ranges from 0 (worst) to 5 (best). In the present study it is observed that hyperpigmentation with increased scar height and band like texture is associated with skin suturing group. Adhesive glue group is associated with less pigmentation, normal skin colour and pliable skin. The difference is of great significance with p value <0.001.

Conclusion:

This study was conducted to compare skin closure techniques with tissue adhesives and skin sutures. The concept of tissue adhesive is superior to skin suture due to the following properties, Faster, comfortable and cosmetically better, Time taken for skin closure is shorter which in turn reduces operating time, It provides flexible, water resistant and sealed skin closure , It forms water tight barrier and allows the patient to take shower at any time.

References:

1. Coover HN, Joyner FB, Sheerer NH (1959) Chemistry and performance of Cyanoacrylate adhesive: special technical papers. 5:413-417.

2. Borley N.R, Mortensen N.J. (2001) Topical adhesive as a wound dressing for elective abdominal surgery: Ann R CollSurg Engl. 80(4):285-286.

3. Mertz PM, Davis SC, Cazzaniga AL, et al (2003) Barrier and antibacterial properties of 2-octyl cyanoacrylate derived wound treatment films: J Cutan Med Surg. 7(1):1-6 8. 9.

4. Quinn J, Wells G, Sutcliffe T, Jarmuske M, Maw J, Stiell I, Johns P (1998) Tissue adhesive versus suture wound repair at 1 year: randomized clinical trial correlating early, 3-month, and 1-year cosmetic outcome. Ann Emerg Med 32(6):645-649 .

5. Matin SF (2003) Prospective Randomized Trial of Skin Adhesive versus Sutures for closure of 217 laparoscopic port-site incisions. J Am CollSurg 196(6): 845-853 10.

6. Man SY, Wong EM, Ng YC, Lau PF, Chan MS, Lopez V, et al. Cost consequence analysis comparing 2 octyl cyanoacrylate tissue adhesive and suture for closure of simple lacerations: A randomized controlled trial. Ann Emerg Med 2009;53:189
7. Handschel JG, epprich , ir sen , unte C, immermann , K bler NR. A prospective comparison of octyl 2 cyanoacrylate and suture in standardized facial wounds. Int J Oral Maxillofac Surg 2006;35:318 23.
8. Greene D, Koch RJ, Goode RL. Efficacy of octyl 2 cyanoacrylate tissue glue in blepharoplasty. A Prospective controlled study of wound healing characteristics. Arch Facial Plast Surg 1999;1:292 6.
9. Singer AJ, Quinn JV, Hollander JE. The cyanoacrylate topical skin adhesives. Am J Emerg Med 2008;26:490 6.