e-ISSN: 0975-1556, p-ISSN:2820-2643

Available online on www.ijpcr.com

International Journal of Pharmaceutical and Clinical Research 2023; 15 (8); 826-830

Original Research Article

Comparative Study between Staplers V/S Subcuticuticular Suture for Wound Closure after Thyroidectomy

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Received: 29-05-2023 / Revised: 30-06-2023 / Accepted: 30-07-2023

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Conflict of interest: Nil

Abstract:

Aim: To Compare Staplers vs subcuticular suture methods for wound closure after thyroidectomy.

Material & Methods: The Study was randomised Prospective conducted on 90 patients by the Department of Otorhinolaryngology ABVGMC Vidisha M.P. from January 2022 to July 2023. Total 90 patients was randomly allocated into two groups with 45 patients in each groups, both groups went into thyroidectomy followed by use of staplers in one group & another one subcuticular suture for skin closure. Drain was placed in all cases. Patients were given IV antibiotics for 7-10 days followed by removal sutures and staplers.

Results: Postoperative pain score at discharge was least in subcuticular group followed by stapler group, though statistically there was no difference. Cosmetically subcuticular group shows excellent result as compare to stapler group. Mean time for closure of skin was less in stapler group.

Conclusion: The choice of material for wound closure will depends on the surgeon's preferences. However this study shows that subcuticular suturing method were more acceptable method for wound closure.

Keywords: Post-operative day (POD), Visula analogue sore (VAS).

Introduction

The goal of surgeries done on neck regions is to achieve good healing with minimal scaring, no discharge, minimal edema or infections. In an Indian setup, Thyroid diseases are most commonly seen in females and most commonly in young females & young adults hence method of skin closure should obtain less pain, scar & more esthetic, In India thyroidectomy most commonly performed by both ENT surgeon's & General surgeon's.

In Selection of suture material, general health status, age, weight, comfort, presence or abscence of infections are as important as nature of wound closure & surgeon's personal preferences. [1]

There are various techniques are developed to give better cosmetically results like subcuticular suture, adhesive tapes, staplers, etc. Sutures or staplers wound should be covered with a protective non-adherent dressing for at least 24 to 48 hours, until enough epithelisation takes place, to protect the wound from infections. [2]

A meta-analysis study was conducted by Wang et al [3] in 2016 found reduced incidence of postoperative complications in subcuticular group, less intraoperative time for skin closure in stapler group, although both groups similar outcome in cosmetic outcome & pain scoring.

Therefore our study aim is to study two skin closure techniques in terms of cost effectiveness, simple, fast, tension free, optimal cosmetic appearance of scar with no subsequent adverse reactions.

Material & Methodology

The study was randomised prospective conducted by Department of Otorhinolaryngology at ABVGMC Vidisha from January 2022 to July 2023. Total no of patients was 90 randomly allocated into 2 groups with 45 patients in each groups, both groups was underwent surgical procedure after obtaining written consent & approval from institutional ethical committee.

Group A (N=45) - Staplers skin closure.

Group B (N=45) – Subcuticular suture skin closure.

Inclusion Criteria

1. Patients aged between 10-60 years of both genders.
2. Normal Body mass index, normal thyroid profiles (euthyroid).
3. With informed / written consent.

Exclusion Criteria

1. Patient previous surgical scar.
2. History of keloid & hypertrophic scar.
3. Patient on anticoagulant therapy, uncontrolled systemic illness.
4. Pregnancy, Immunocompromised status.
5. Serology positive.

For skin closure, suture material used synthetic non-absorbable monofilament ethilon nylon & stapler (Ehicon Proximate) followed by non-adhesive dressing for 24-48 hours.Subcuticular drain placed in all cases. All patients were given IV antibiotics for7-10 days followed by removal of suture n staplers.

The data obtained in the study included:

1. Time taken for closure- The time taken for closure was calculated (in min) beginning from the placement of first stapler or suture to completion.
2. Pain on removal of staplers or suture – Patient was evaluated for pain on removal of staplers or suture using visual analogue scale scoring from 0 to 4. No pain(0) to worst pain (4), on the questionnaires, , POD-1, POD- 3 & POD-7.
3. Aesthetic outcome on the day of suture / stapler removal i.e POD-7, 6th week was analysed by independent blinded observer as excellent & good.
4. Complications rate such as wound dehiscence, wound discharge during immediate postoperative and follow up was recorded.

Statistically Analysis

Data so collected was tabulated in excel sheet, under the guidance of statistician. The mean & standard deviation of the measurement per group were used for statistical analysis (SPSS 22.00 inc, Chicago, USA). For each assessment point, data were statistically analyzed using one way ANOV. Difference between groups was determined using student t-test as well Chi square under the level of significance was set at $p < 0.05$.

Results

Total 90 patients was taken of both genders out of which 63 was females and 37 was male, with mean of around 34.5 years.

In FNAC reports, out of 90, 50 patients were diagnosed with nodular colloid goitre, 20 patients were with cystic nodule, 10 was with nodular goitre with adenomatous changes, 7 patients with inflammatory thyroid conditions & 3 patients of hashimotto diseases.

Table 1: Visual analogue scale (VAS) for pain at post-operative day one (POD - 1)

Visual analogue scale (VAS) %	Closure types		Total
	Group A Stapler	Group B Subcuticular	
0 count (%)	0	0	0 (0%)
1 count (%)	0	0	0(0%)
2 count (%)	3(6.66%)	16(35.55%)	19(21.11%)
3 count (%)	37(82.22%)	26(57.77%)	63(70%)
4 count (%)	5(11.11%)	3(6.66%)	8(8.88%)
Total	45	45	90

Chi square =11.3154, p value = 0.003491 i.e, Significant.

Table 2: Visual analogue scale (VAS) for pain (day 3)

Visual analogue scale (VAS) %	Closure type		Total
	Group A Skin Staplers	Group B Subcuticular	
0 count (%)	40 (88.9)%	32 (71.1)%	72 (80%)
1 count (%)	5 (11.1)%	13 (28.9)%	18 (20%)
2 count (%)	0	0	0
3 count (%)	0	0	0
Total	45 (100%)	45 100%	90 100%

P value = 0.014i.e, significant

Table 3: Visual analogue scale (VAS) at post-operative day one (POD -7)

VAS	Closure types	Total

	Group A Stapler	Group B Subcuticular	
0 count (%)	0	0	0
1 count (%)	34(75.55%)	24(53.33%)	58(64.44%)
2 count (%)	5(11.11%)	16(35.55%)	21(23.33%)
3 count (%)	4(8.88%)	3(6.66%)	7(15.55%)
4 count (%)	2(4.44%)	2(4.44%)	4(4.44%)
Total	45	45	90

Chi square= 7.63, P value = 0.054 i.e, insignificant.

Table 4: Visual analogue score (VAS) for cosmetic appearance after 6 weeks

VAS	Closure types	
	Group A Staplers	Group B Subcuticular
Excellent	28	43
Good	17	2
Total	45	45

P value = 0.005 i.e., significant

Table 5: Time required for skin closure in (sec) among study groups

Groups	Mean (in seconds)	Standard Deviation
Group A Skin Stapler	68.10	7.843
Group B Subcuticular	445.50	8.455
Total	45	45

P value = <0.01 i.e, significant

Figure 1: Showing postoperative cosmetic scar at 7th day (A) & 6th week (B) of subcuticular suture

Figure 2: Showing Post operative scar of Stapler at POD 5

Figure 3: Showing postoperative scar after stapler removal at 6th week

Figure 4: Showing Wound dehiscence after stapler removal

Discussion

There is no standard protocol for the methods. In general simple interrupted technique of wound closure is commonly performed, it is easy to learn and master but having inferior cosmetic results.On the other hand subcuticular suture is considered an elegant but difficult in learning and time consuming. Topical adhesive and skin staplers are recent methods they are fast, simple, tension free with no subsequent adverse reaction.

In present study wound closure by subcuticular group has less pain & more neck mobility on postoperative day one & 3 as compare to stapler group as p value were significant. Study done Selvadurai et al [4] study done 38 patients randomly divided into groups using Michel clips & subcuticular suture groups experienced similar degree of pain on first 3 postoperative days although there was no statistically significant difference between two groups. Study done by Ankit mohan das et al5 found at post-operative day 1 mean pain score of stapler group were 1.78±0.616 & subcuticular group were 1.36±0.485. In our study among the groups at 7th postoperative day pain score were least in subcuticular suture group as compare to stapler although p value become insignificant same result found in study done ankit mohan das. Blackshaw G6 found more pain in stapler group while removing as our study does. Study by Geeta S. Ghag et al [7],Mean VAS pain score at 48 hours are more significant in interupted group as compare to stapler & subcuticuar suture group 3.07 & 2.97 respectively p value significant. VAS score at the time of discharge in less in subcuticular group 1.13 as compare to stapler and interupted 1.80 &1.87 respectively.

In our study, cosmetic results were excellent at 6th week in subcuticular group as we close close the wound in three layers a compare to stapler group (p value significant). Study done ankit mohan das et al mean at 5th day post operatively among subcuticular, interupted, stapler are 13.10±1.165, 24.58±1.03, 23.08±1.03 respectively. Meiring et al [8] showed cosmetically stapler better than nylon suture. Study done by Vinay Get et al9 shows wound closure by steristrips had excellent scar appearance followed by subcuticular suture. Study by Abu NGA et al [10] shows that stapler had a better cosmetic scar than subcuticular.

In our study mean time for closure of skin after thyroidectomy in stapler 68.10 seconds as compare to subcuticular group 445.50 seconds (p value significant). Study done by Geeta S. Gharg et al

shows least mean time in stapler group 44.63±47.23 sec, interrupted 193.33 sec & subcuticular group 459.93 seconds. Meiring et al found time saving of 80% is saving with the stapling device. In our study the wound infection rate among stapler & subcuticular are 25%, 30% respectively with p value insignificant same as study by Ankit das et al found infection rate among interrupted, stapler & subcuticular – 12%, 20%, 24% respectively although p value insignificant >0.05. Study by Geeta S. Ghag et al found 60% infections rate in subcuticular group followed by stapler group 26.7%. Whereas Stillman [11] & Colleagues confirms that skin closure by stapler exhibits advantage of not crossing the wound edges.

Limitation of our study were, Most of the population belongs to low socioeconomic strata and high cost of other materials ,that why we have go for options available by govt in our setup for wound closure, i.e, vicryl & staplers hence we cannot extend our study beyond these two materials.

Conclusion

The choice of wound closure material depends on surgeon's preferences. Our study concludes that subcuticular suture is material is good because aim of any neck surgery should be minimal scar with no or less postoperative wound infection/dehiscence.

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