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Comparison of Post-operative Pain in Patients with Platysma Muscle Suture versus no Suture for Wound Closure after Thyroid Surgery

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Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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ABSTRACT

Objective: To assess the post-operative pain in patients with platysma muscle suture versus without platysma muscle suture used for wound closure after thyroidectomy.
Study Design: Randomized clinical trial.
Duration: January 2020 to March 2021.
Setting: Department of General Surgery, Jinnah Postgraduate Medical Center, Karachi.
Methods: A total number of 68 patients planned for primary thyroid surgery, aged 18-60 years of both genders were included in this study. Patients were divided into two equal groups using draw randomization. In Group I: platysma muscle suture was used during wound closure after thyroidectomy. In Group II: No platysma suture was used during wound closure after thyroidectomy. Postoperative pain score was noted at 24 hours after thyroidectomy.
Results: Mean age of patients was 39.25±11.68 years. Mean body mass index (BMI) of patients was 24.48±3.60 kg/m2. Mean duration of surgery was 88.81±15.22 minutes. Mean postoperative pain score was 2.78±1.37. There were 39 (57.35%) females and 29 (42.65%) female patients. There were 18 (26.47%) patients having ASA I, 44 (64.71%) having ASA status II and 06 (8.82%) patients having ASA status III. There were 18 (26.47%) patients with hemi-thyroidectomy and 50

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(73.53%) with total thyroidectomy. Post-operative pain score was 3.26±1.50 in with platysma muscle suture and 2.29±1.03 in without platysma suture (p-value 0.003).
Conclusion: As per current research, postoperatively, there was less discomfort related to the incision when the platysma muscle suture was not used. Further studies with a larger sample size is warranted.

Keywords: Thyroid surgery; platysma muscle suture; post-operative pain.

1. INTRODUCTION

Whether benign or malignant, thyroid diseases are regularly managed with surgery. Postoperative pain, and postoperative nausea and vomiting (PONV) are possible outcomes of total thyroidectomy. [1,2] Several mechanisms orchestrate postoperative pain after these thyroid procedures [1]. It is central to patient care that postoperative pain be adequately managed. Adequate management of pain is also correlated to better patient satisfaction and health outcomes [3,4].

Various skin closure techniques have been scrutinized in many prospective randomized trials with regards to thyroid surgery [5,6]. The literature revealed one prospective study analyzing the clinical advantages of platysma muscle suture technique which is a rather common practice [7]. The platysma muscle depresses the angle of the mouth. It originates from the superior parts of the pectoralis major and deltoid. It then runs as a subcutaneous sheet superiorly to insert into the inferior part of the mandible. Suturing the platysma for approximation after thyroid surgery is considered to reduce the risk of seroma formation and other complications [8]. Alternatively, suture material (foreign body) may cause granuloma formation and so may have poor cosmetic outcomes and lead to postoperative pain [9].

To our best knowledge only one study has been conducted to determine the effect of use of platysma muscle suture on post-operative pain after thyroidectomy. In this study the mean post-op VAS pain score in patients in whom platysma muscle suture after 24 hours of thyroidectomy was 3.15+1.46 versus 2.17+1.41 in patients in whom platysma muscle suture was not used [7]. Avoiding muscle suture is an easy way of controlling postoperative pain after thyroidectomy. Moreover, existing literature also concluded that avoiding muscle suture does not affect the cosmetic concerns of the patients [7].

Because only one study (to our best knowledge) has been conducted so far, there is a need to determine the effect of avoiding platysma muscle sutures on postoperative pain. So the aim of the proposed study is to compare the post-operative pain in patients in whom platysma muscle suture will be used with patients in whom no platysma muscle suture will be used for wound closure after thyroidectomy. Because platysma muscle suture is routinely used during wound closure in our setup. If avoiding platysma muscle suture is really helpful in controlling the post-op pain then the practice of using it will be left in our setup. This study results would help other general surgeons to decide either to use sutures or there is no need for platysma muscle sutures for wound closure in thyroidectomy patients. So as to reduce morbidity and discomfort associated with post-op pain in our patients after thyroidectomy.

2. MATERIALS AND METHODS

A quasi experimental study was conducted at the department of General Surgery, Jinnah Postgraduate Medical Center Karachi between January 2020 to March 2021. A non-probability consecutive sampling was employed to recruit participants.

Patients scheduled to undergo primary thyroid surgery aged between 18 and 60 years were included. Patients with ASA status IV, with confirmed diagnosis of malignant thyroid lesions on FNAB, or histological reporting, or those with a history of neck surgery were excluded.
The sample size was calculated by taking expected post-op pain score 3.15+1.46 in patients with platysma muscle suture versus 2.17+1.41 in patients without platysma muscle suture [7], power of the test 80% and level of significance 5.0%. A total sample size of 136 (68 in each group) was determined.

After approval of the proposed synopsis, a total number of 68 patients planned for primary thyroidectomy were included in this study.

Patients were divided into two equal groups using draw randomization, by making folded papers containing the name of treatment and placing them in a jar. Each patient was instructed to take one folded piece of paper out of the jar. Based on the folded paper the patients picked, they were split into Group I and Group II.

In Group I: platysma muscle suture was used during wound closure after thyroidectomy.

In Group II: No platysma suture was used during wound closure after thyroidectomy. Thyroidectomy was performed in all patients by consultant surgeons having a minimum 3 years post-fellowship experience. In group I and II wound closure was done according to the specified techniques. Skin in both groups was closed using a running absorbable intracutaneous monofilament suture (Monocryl® 4/0; Ethicon). For 48 hours, a sterile wound dressing was applied to the lesion. No wound drains were inserted in either group.

Postoperative pain score was noted at 24 hours after thyroidectomy according to the criteria given in the operational definitions. Data regarding patients age, gender, BMI, type of thyroidectomy, and duration of surgery were also noted. A specialized Proforma was used to collect all relevant study data.

Statistical Package for Social Sciences (SPSS v23, IBM, Chicago, USA) was used to enter and analyse all data. Mean and standard deviations were calculated for age, height, weight, BMI, duration of surgery and VAS pain score. Frequency and percentage were calculated for gender, ASA status and type of thyroidectomy. Independent sample t-test was applied to compare postoperative pain between the groups. Confounding factors such age, gender, BMI, ASA status, operation length, and thyroidectomy type were managed by stratification. Post-stratification independent sample t-test was applied to determine the effect of confounder variables on post-operative pain score between the groups. P-value <0.05 was considered a significant difference.

3. RESULTS

Mean age of patients included in this study was 39.25±11.68 years. Minimum age was 18 years and maximum age was 60 years. Mean body mass index (BMI) of patients was 24.48±3.60 kg/m2. Minimum BMI was 18.40 kg/m2 and maximum BMI was 34.68 kg/m2. Mean duration of surgery was 88.81±15.22 minutes. Minimum duration was 67 minutes and maximum minutes was 125 minutes. Mean postoperative pain score was 2.78±1.37. There were 18 (26.47%) patients with hemi-thyroidectomy and 50 (73.53%) with total thyroidectomy (Table 1).

The postoperative pain score was 3.26 ± 1.50 with platysma muscle suture and 2.29 ± 1.03 without platysma suture upon comparing the two groups. This difference was statistically significant with a p-value of 0.003. There was a strong association of age with post-operative pain score between the groups (p-value = 0.030). In the female population, the postoperative score with platysma muscle suture experienced

Table 1. Clinical characteristics of study patients

Characteristics	Mean/ Frequency
Age (years)	39.25 ± 11.68
Height (cm)	166.31 ± 7.32
Weight (kg)	67.79 ± 10.06
BMI (kg/m2)	24.48 ± 3.6
Duration of Surgery (hours)	88.81 ± 15.22
Post-operative score	2.78 ± 1.37
Gender	
Male	29 (42.6%)
Female	39 (57.4%)
ASA status	
I	18 (26.5%)
II	44 (64.7%)
III	6 (8.8%)
Type of thyroidectomy	
Hemi-thyroidectomy	18 (26.47%)
Total thyroidectomy	50 (73.53%)

Table 2. Stratification of Postoperative pain score with Platysma muscle suture with patient characteristics

	Platysma muscle suture		
	Yes	**No**	**p-value**
Mean Post-operative score	3.26 ± 1.5	2.29 ± 1.03	0.003
Age groups			
18-36 years	3.2 ± 1.7	2.11 ± 1.02	0.03
37-60 years	3.32 ± 1.38	2.5 ± 1.03	0.03
Gender			
Male	3.25 ± 1.52	2.44 ± 1.33	0.182
Female	3.29 ± 1.54	2.24 ± 0.92	0.012
BMI			
<25 kg/m2	2.89 ± 0.96	2.18 ± 1.05	0.034
>=25 kg/m2	3.69 ± 1.89	2.5 ± 1	0.059
ASA status			
I	3 ± 1.51	2.5 ± 1.08	0.425
II	3.3 ± 1.36	2.23 ± 1.04	0.006
III	3.67 ± 2.89	2 ± 1	0.577
Duration of surgery			
67-85 mins	3.71 ± 1.59	2.32 ± 0.99	0.003
86-125 mins	2.95 ± 1.39	2.25 ± 1.13	0.153
Type of thyroidectomy			
Hemi-thyroidectomy	3.62 ± 1.99	1.9 ± 1.1	0.033
Total thyroidectomy	3.15 ± 1.34	2.46 ± 0.98	0.043

a higher pain score than those without (p=0.012). Stratification was also performed on the basis of BMI, ASA status, duration of surgery and type of thyroidectomy as illustrated in Table 2. Surgery duration between 67-85 mins was significantly associated with a higher pain score in the platysma muscle suture group.

4. DISCUSSION

Across Europe wound closure following cervicotomy is routinely done by suturing of the platysma. Several sizable trials illustrate this [10,11]. Regardless, no concrete evidence can be found in the support of this practice and advantages conferred by it have not been studied. According to our RCT, this practice may be excluded from routine.

The early postoperative period demonstrated significantly lower instances of wound-related pain. Platysma muscle fibers coalesce in the medial line of the muscle, in the lower cervical area there is potential for dehiscence. This can be misconstrued as an absent platysma in minute cervicotomies. The outcomes of greatest value when addressing the issue of benefits of platysma suture are; the impact of reconstruction, if present, on functionality, cosmetics, seroma formation, and pain [12]. Almeida et al. described that the primary function of the cranial (upper) part of the platysma is in its capacity as a facial muscle of the mouth. Thus it can be inferred that cervicotomies for thyroid procedures such as resection, which are carried out caudally, do not greatly affect its function of moving the angle of the mouth [13]. In our RCT, after 6 months no inadequacy was seen in mouth movement.

Following thyroid surgery pain is usually of moderate intensity and occurs only during the initial days. It is thus managed with non-opioid pain medications [14]. A small number of patients require rescue with opioid analgesics. This increases length of inpatient stay and time till discharge [15]. In this RCT we observed that patients that had not undergone platysma suturing reported lower pain scores in the initial postoperative stay. The mean VAS score was 3.26±1.50 in with platysma muscle suture and 2.29±1.03 in without platysma suture.

A study by Senne et al. reported similar outcomes, in their study the mean post-op VAS pain score in patients in whom platysma muscle suture after 24 hours of thyroidectomy was 3.15

+1.46 versus 2.17+1.41 in patients in whom platysma muscle suture was not used [7].

Local Edema and damaged blood supply can lead to greater reported pain in the group receiving platysma sutures and this might explain the finding. Postoperative pain may also increase by the use of polyfilament absorbable sutures like polyglactin. These sutures lead to inflammatory tissue reactions and edema [16]. It should also be noted that an RCT contrasting skin closure techniques (skin closure only, in comparison to, two-layered subcutaneous closure followed by skin closure) for great saphenous vein extraction for CABG (Coronary Artery Bypass Grafting) demonstrated higher reported pain scores and numbness with the second technique (subcutaneous sutures) in the early postoperative period [17].

Wasay et al., revealed that in individuals experiencing thyroidectomy without platysmal suture as opposed to those with standard platysmal suture during thyroidectomy, the mean VAS score for post-operative pain recorded 24 hours after the surgery was considerably lower (2.370.97 vs. 3.671.28; $p < 0.001$) [18].

There are some limitations in the study. Due to the small sample size the study findings cannot be generalized to a larger population. Furthermore, we also did not use randomization technique to recruit participants due to time and resource constraints. Therefore, selection bias might be present. We recommend larger studies with a more comprehensive study design should be conducted to ascertain these findings.

5. CONCLUSION

As per current research, postoperatively, there was less discomfort related to the incision when the platysma muscle suture was not used. Further studies with a larger sample size is warranted.

ETHICAL APPROVAL

The study was commenced after the ethical approval was obtained from the institutional review board committee.

CONSENT

A written informed consent was taken from all patients before including them in this study.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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