

Comparative effects of suture and non-suture surgical techniques on platysma after Thyroid surgery: a randomized controlled trial

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ABSTRACT

Background: Thyroidectomy is a routine general surgical procedure and pain after thyroidectomy is responsible for prolongation of hospital stay and increased risk of respiratory complications. Platysma is routinely sutured at the end of thyroidectomy before wound closure. This randomized controlled trial was conducted to compare the outcome of suturing platysma muscle versus not suturing in thyroid surgery patients.

Aim: To compare the outcome of suturing platysma muscle versus not suturing in thyroid surgery patients.

Place and duration of study: Dept. of Surgery at Sh. Zayed Hospital, Lahore from 26-12-2019 to 25-06-2020.

Methodology: It is a randomized controlled trial study which consists of 92 patients, between 18 to 70 years of age in both gender and planned for thyroidectomy for nodular thyroid enlargement. Patients were randomly allocated into two treatment groups. After excision of thyroid, platysma was sutured as per conventional practice in one group while in the other group platysma was not sutured. For pain assessment Visual Analogue Scale (VAS) was used to 24 hours after surgery.

Results: The mean age was 36.4±13.4 years. The mean VAS score for post-operative pain measured 24 hours after the surgery was significantly lower in patients undergoing thyroidectomy without platysmal suture as compared to those with conventional suturing of platysma during thyroidectomy (2.37±0.97 vs. 3.67±1.28; p <0.001). Similar significant difference was also noted between groups and subgroups which based on patient's age, gender, BMI and educational status.

Conclusion: Avoiding the suturing of platysma significantly reduced the post-operative pain which advocates a change in current practice and encourages non-suturing of platysma to decrease the morbidity of patients in post-operative period.

Keywords: Thyroidectomy, Platysma, Suture, No Suture, Pain

INTRODUCTION

Thyroid surgery is performed widely for benign and malignant thyroid diseases. Although several randomized trials have been done for different skin closure in thyroid surgery but there is no proven evidence of benefit of closing platysma muscle in thyroid surgery^{1,2,3}. Platysma originates from fascia covering the upper parts of pectoralis major and deltoid. Anterior fibers of platysma enlase in midline with fibers of opposite muscle, below and behind the symphysis menti. Insertion of rest of the fibers is at inferior border of the mandible and subcutaneous tissue of face⁴. Thyroidectomy is performed by standard approach of using anterior neck incision known as "Kocher incision" which is 6-8cm long⁵. Thyroidectomy has high success rates and low morbidity in experienced hands. But still thyroid surgery has multiple concerns⁶. Pain after thyroidectomy is usually moderate and occurs for only few days after surgery which require analgesia with non-opioid analgesics⁷. Moderate pain after thyroidectomy is well documented⁸. A study shows that 90% of patients which require morphine post-operatively following thyroidectomy, the mean score of patient reported pain score was 6.9 (on a scale of 0-10)⁹. Some patients require opioids in initial post-operative period which is the cause of delay in hospital discharge¹⁰.

Pain after thyroidectomy may be caused by suturing the platysma muscle which causes local edema and compromised blood supply. Absorbable suture that is polyglactin causes an inflammatory tissue reaction and edema, which is the aggravating factor for pain after thyroidectomy¹¹. A study was conducted in which patients were assigned randomly to receive a platysma suture or no platysma suture, patient-blinded trial. The follow up duration was 6 months. The primary endpoint was pain of specific wound after 24 hours of thyroid operation. Secondary endpoints were intraoperative and perioperative analgesia requirement, postoperative pain and complications until postoperative day 14, patient and Observer Scar Assessment Score (POSAS) 6 months after surgery. Omitting the platysma muscle suture after thyroid surgery resulted in less wound-specific pain initially with no difference in postoperative wound complications or cosmetic results.

The objective of the study was to compare the outcome of suturing platysma muscle versus not suturing in thyroid surgery patients.

MATERIALS AND METHOD

This randomized controlled trial study was done in accordance with the guidelines outlined in the declaration of Helsinki. The approval of the study was obtained from ethics committee of Surgery Shaikh Zayed Hospital, Lahore. Written informed consent was taken before

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participation in surgery. The patients were recruited via non-probability convenient sampling. In this study 92 patients were assigned to two equal groups (46 cases in each group): experimental or control. Both female and male aged 14 to 70 years with primary thyroid surgery for multinodular goiter and benign nodules were eligible for this trial. Patients with previous history of neck surgery, surgical resection beyond thyroid, patients on analgesics, patients allergic to NSAIDS and immunocompromised were excluded from the study.

After approval from hospital ethical review committee demographic data and history was taken relevant to disease from the patients admitted through OPD in Department of General Surgery. Baseline investigations were performed and anesthesia fitness was obtained preoperatively. Informed written consent was obtained for all patients, preoperatively, for surgery and for inclusion of research also. Total number of patients was 92, with 46 in each group. Patients were divided at random by using random number tables either into the suture (Group A) or no suture (Group B) groups. All the patients were operated by consultants to keep procedural differences minimum. Pain score (VAS score) was measured after 24 hours of surgery.

Data for age and pain score at 24 hours have been presented by using mean±SD. Gender has been presented as frequency and percentage. Mean pain score at 24 hours has been compared between the groups using independent sample t-test taking p ≤0.05 as statistically significant. Data has been stratified for age, gender, BMI and educational status to address effect modifiers. Post-stratification independent sample t-test has been applied taking p ≤0.05 as statistically significant.

RESULTS

Out of 92 participants, the mean age was 36.4±13.4 years from 18 to 70 years. Majority 53(57.6%) of the patients were aged between 26-50 years, followed by 25(27.2%) patients aged ≤25 years and 14 (15.2%) patients aged >50 years. There were 18(19.6%) male and 74(80.4%) female patients with ratio of 1:4.1 male to female. The BMI of these patients ranged from 21.2Kg/m² to 34.4Kg/m² with a mean of 26.9±3.8 Kg/m². 39(42.4%) patients were illiterate, 33(35.9%) patients had a primary or middle school certificate while 20(21.7%) patients had a matriculation or above degree (Table 1). Both groups were comparable in terms of mean age (p 0.877), mean BMI (p 894) and distribution of various subgroups based on age (p 0.842), gender (p 0.599), BMI (p 0.965) and educational status (p 0.880) (Table 2).

The mean VAS score for post-operative pain measured 24 hours after the surgery was significantly lower in patients undergoing thyroidectomy without platysmal suture as compared to those with conventional suturing of platysma during thyroidectomy (2.37±0.97 vs. 3.67±1.28; p <0.001) (Table 3). Similar significant difference was noted between groups across various subgroups based on patient's age, gender, BMI and educational status (Table 4).

Table1: Baseline particulars of study population (n=92)

| Characteristics | Participants |
|-------------------------------|--------------|
| Age (years) | 36.4±13.4 |
| ≤25 years | 26(27.2%) |
| 26-50 years | 54(57.6%) |
| >50 years | 14 (15.2%) |
| Gender | |
| Male | 18 (19.6%) |
| Female | 74 (80.4%) |
| BMI (Kg/m²) | |
| 20-25 Kg/m ² | 37(40.2%) |
| 25-30 Kg/m ² | 32(34.8%) |
| 30-35 Kg/m ² | 23(25.0%) |
| Educational status | |
| Illiterate | 39 (42.4%) |
| Primary/Middle | 33 (35.9%) |
| Matric/Above | 20 (21.7%) |

Table2: Baseline particulars of patients

| Particulars | No Suture n=46 | Suture n=46 | P value |
|-------------------------------|----------------|-------------|---------|
| Age (years) | 36.20±13.29 | 36.63±13.58 | 0.877 |
| ≤25 | 13 (28.3%) | 12 (26.1%) | 0.842 |
| 26-50 | 27 (58.7%) | 26 (56.5%) | |
| >50 | 6 (13.0%) | 8 (17.4%) | |
| Gender | | | |
| Male | 10 (21.7%) | 8 (17.4%) | 0.599 |
| Female | 36 (78.3%) | 38 (82.6%) | |
| BMI (Kg/m²) | 26.81±3.71 | 26.92±3.93 | 0.894 |
| 20-25 Kg/m ² | 19 (41.3%) | 18 (39.1%) | 0.965 |
| 25-30 Kg/m ² | 16 (34.8%) | 16 (34.8%) | |
| 30-35 Kg/m ² | 11 (23.9%) | 12 (26.1%) | |
| Educational Status | | | |
| Illiterate | 19 (41.3%) | 20 (43.5%) | 0.880 |
| Primary/Middle | 16 (34.8%) | 17 (37.0%) | |
| Matric/Above | 11 (23.9%) | 9 (19.5%) | |

Table 3: Comparison of mean VAS score for post-operative pain between the study groups

| Study outcome | No Suture n=46 | Suture n=46 | P value |
|-------------------------------|----------------|-------------|---------|
| Post-Operative Pain (mean±SD) | 2.37±0.97 | 3.67±1.28 | <0.001* |

Table 4: Comparison of mean VAS score for post-operative pain between the study groups across various subgroups

| Subgroups | Post-Operative Pain (mean±SD) | | P value |
|---------------------------|-------------------------------|---------------|---------|
| | No Suture (n=46) | Suture (n=46) | |
| Age | | | |
| ≤25 years | 2.31±1.11 | 3.58±0.99 | 0.006* |
| 26-50 years | 2.41±1.01 | 3.65±1.36 | <0.001* |
| >50 years | 2.33±0.52 | 3.88±1.55 | |
| Gender | | | |
| Male | 2.20±0.79 | 3.63±1.06 | 0.005* |
| Female | 2.42±1.03 | 3.68±1.34 | <0.001* |
| BMI | | | |
| 20-25Kg/m ² | 2.47±0.91 | 3.67±1.41 | 0.004* |
| 25-30Kg/m ² | 2.38±1.03 | 3.63±1.31 | 0.005* |
| 30-35Kg/m ² | 2.18±1.08 | 3.75±1.14 | 0.003* |
| Educational Status | | | |
| Illiterate | 2.37±1.07 | 3.70±1.46 | 0.002* |
| Primary/Middle | 2.38±0.89 | 3.65±1.12 | 0.001* |
| Matric/Above | 2.36±1.03 | 3.67±1.32 | 0.023* |

DISCUSSION

In thyroid surgery, acute postoperative pain is one of the more distressing aspects. It is a complex physiological reaction to tissue injury that manifests from autonomic, psychological, and behavioral responses¹². Currently, pain is considered a mandatory part of the comprehensive surgical postoperative experience^{13,14}. Developments in the understanding of the epidemiology and pathophysiology of pain has focused greater attention on a multimodal approach to the management of postoperative pain in an effort to improve quality of life and functionality, enhanced activities of daily living, and reduced physiological and emotional morbidity¹³. Opioids, a mainstay of postoperative pain management, are available in many formulations with multiple routes of administration¹⁴. However, a common side effect of all of these drugs is increased risk of nausea and vomiting, respiratory depression and slower post-operative recovery. Therefore, more and more research is now focused on preventing or at least diminishing the surgical pain whenever possible^{12,14}. A recent study claimed that non-suturing of platysma was associated with significantly lesser pain in the post-operative period and recommend it in future practice¹⁵.

The mean age of patients with nodular thyroid enlargement was 36.4±13.4 years. A similar mean age of 36.9±12.2 years has been reported by Khan et al¹⁶ among patients presenting with nodular thyroid enlargement at Pakistan Institute of Medical Sciences Islamabad. Ahsan et al¹⁷ reported similar mean age of 35±2.2 years among patients presenting with goiter at Jinnah Postgraduate Medical Centre, Karachi. In another local study, Anwar et al¹⁸ reported comparable mean age of 37±12.5 years among such patients at Hayatabad Medical Complex, Peshawar. Jena et al¹⁹ reported similar mean age of 36.8±13.3 years in Indian such patients while Hossain et al²⁰ and Rashid et al²¹ reported it to be 36.5±12.3 years and 38.9±15.3 years respectively in Bangladesh. Jat et al²² reported similar mean age of 35±7.9 years among Saudi. We observed that majority (57.6%) of the patients were aged between 26-50 years, followed by 25(27.2%) patients aged ≤25 years and 14(15.2%) patients aged >50 years. Anwar et al¹⁸ in a similar local study at Hayatabad Medical Complex, Peshawar observed similar frequency of ≤25 years, 26-50 years and >50 years age groups among such patients and reported it to be 36.2%, 52% and 11.8% respectively. A similar distribution of ≤25 years (22.8%), 26-50 years (70.2%) and >50 years (7%) has also been reported by Saqlain et al²³ among patients presenting with nodular thyroid enlargement at various hospitals of Sindh. Comparable frequency of 22%, 64% and 14% for ≤25 years, 26-50 years, >50 years age groups has been reported by Shrestha et al²⁴ in Indian such patients while Hossain et al²⁰ reported these frequencies to be 24%, 66% and 10% respectively in Bangladesh²⁰. There were 18(19.6%) male and 74 (80.4%) female patients with nodular thyroid enlargement with a male to female ratio of 1:4.1. Ahsan et al¹⁷ who also noted that male to female ratio of 1:4.1 at Jinnah Postgraduate Medical Centre, Karachi which is comparable with our study. Similar female predominance with male to female ratio of 1:4 has also been reported by Ahmad et al²⁵ at Madina Teaching

Hospital, Faisalabad. In various other local studies Anwar et al¹⁸ (1:3.5), Ullah et al²⁶ (1:3) and Khan et al¹⁶(1:3) also reported similar female predominance among such patients. Our observation is also in line with that of Gautam et al²⁷, Jena et al¹⁹ and Krishna et al²⁸ who noted similar male to female ratio of 1:4, 1:3.8 and 1:3.4 respectively. A relatively higher female patients with male to female ratio of 1:6.6 has been reported by Rashid et al²¹ in Bangladesh. In the present study, we noticed that the mean VAS score for post-operative pain measured 24 hours after the surgery was significantly lower in patients undergoing thyroidectomy without platysmal suture as compared to those with conventional suturing of platysma during thyroidectomy (2.37±0.97 vs. 3.67±1.28; p <0.001).

CONCLUSION

Avoiding the suturing of platysma significantly reduced the post-operative pain which advocates a change in current practice and encourages non-suturing of platysma to decrease the morbidity of patients in post-operative period.

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