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Comparative Study on Sutures vs Staples for Skin Closure in a Patient Undergoing Thyroidectomy

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ABSTRACT

Background: Thyroidectomy is a commonly performed surgical procedure and appropriate skin closure technique plays a crucial role in postoperative recovery, cosmetic outcomes, and patient comfort. Sutures and staples are widely used for skin closure however their comparative effectiveness remains debated.

Objective: To compare postoperative outcomes of sutures versus staples for skin closure following thyroidectomy in terms of pain intensity, wound complications, patient comfort, and cosmetic appearance.

Methodology: This prospective observational study was conducted at Shalamar Hospital, Lahore, Pakistan. A total of 101 patients undergoing thyroidectomy were included. Patients were divided into two groups based on the skin closure technique used: sutures (n=53) and staples (n=48). Postoperative pain was assessed using the Visual Analog Scale (VAS), while wound outcomes were evaluated using the Modified Southampton Wound Scoring System. Data were analyzed using SPSS version 25.

Results: Staples demonstrated better wound appearance and lower rates of inflammation and serous discharge compared to sutures. However, patients in the staple group experienced significantly higher postoperative pain scores (p=0.016). No statistically significant differences were observed between the two groups regarding seroma formation, drain comfort, or ICU stay.

Conclusion: Staples provide superior cosmetic outcomes and reduced wound complications but are associated with increased postoperative pain, which can be effectively managed with analgesics. Selection of skin closure techniques should be individualized based on patient needs and surgeon preference.

Keywords: *Thyroidectomy; Sutures; Staples*

INTRODUCTION

Thyroidectomy is a surgical operation to remove all or parts of the thyroid gland. The thyroid gland is a ductless, butterfly-shaped endocrine gland located in the anterior neck, just below the larynx. It weighs about 15-20 grams. It consists of two lobes present on either side of windpipe trachea. Thyroid glands produce Thyroid hormones responsible for metabolic health, growth and development. Thyroid hormones referred as major metabolic hormones named as triiodothyronine (T3) and thyroxin (T4). It has many functions including controlling heart, muscle and digestive function, brain development and bone maintenance. Approximately 90-100 µg of T4 is produce from thyroid gland and 30-35 µg of T3 daily. Under-reactive hormones typically result in bradycardia, cold intolerance, constipation, exhaustion, and weight gain. In contrast, weight loss, heat sensitivity, diarrhea, fine tremors, and muscle weakness are signs of hyperthyroidism brought on by increased thyroid gland activity. Its release should be balanced otherwise it cause many serious issues (Neerav 2018).

Thyroid diseases are widely prevalent across the world. It affects due to multiple factors like malnutrition, iodine deficiency, radiation exposure and congenital thyroid diseases. The prevalence of thyroidectomies is more common in women than in man which is in between 1-2% for hypothyroidism and 0.5-2% for hyperthyroidism. According to epidemiological studies 1% of men and 5% of women diagnosed with thyroid nodules clinically in iodine- deficient populations. Congenital hypothyroidism is also common among the newborns in 3500– 4000 births in iron-depleted areas (Vanderpump, cham & springer 2019).16-31% adults are having thyroidectomies for multiple thyroid diseases due to radiations. (Maja Sulejmanovic et al. 2019) Estimated 20 million Americans have thyroid diseases. Approximately, 93,000 thyroidectomies are performed each year in the United States. Increasingly, these procedures are performed on an ambulatory basis. Global prevalence of thyroidectomies is 5%-10% and in Pakistan, Ratio of thyroid diseases especially hyperthyroidism is 5.1% (Compton 2020).

There are multiple reasons to perform thyroidectomy such as thyroid cancer, malignancy, symptomatic goiter, hyperthyroidism, or primary hyperparathyroidism and multi-nodular goiter. Differentiated thyroid cancers such as papillary and follicular and poorly differentiated and anaplastic carcinomas. Patients who experience compressive symptoms from a big goiter, such as dysphagia, dyspnea, shortness of breath and hoarseness should have a thyroidectomy. The first symptom to manifest is typically dysphagia to solids. Goiter-related aesthetic issues may warrant a thyroidectomy (Neerav 2018).

Part of the thyroid gland is removed in thyroidectomy depends upon the indication of the surgery. Thyroidectomy can be of two type total thyroidectomy and partial thyroidectomy. Total thyroidectomy involves the surgical removal of all or most of the thyroid gland. Partial thyroidectomy involves the removal of a part of the thyroid gland. Partial thyroidectomy has further four subcategories thyroid lobectomy involves the removal of one lobe of the thyroid gland, thyroid lobectomy with isthmectomy removal of tumors in the thyroid tissue between the two lobes of the thyroid gland (thyroid isthmus), partial thyroid lobectomy, and subtotal thyroidectomy (Andrew 2023).

An anterior cervical, Kocher and collar crease incision at 2-3cm above suprasternal notch is frequently used in the surgical approach to thyroid glands. Approximation of surgical incision is a critical issue and it plays a significant role in the affected person's recovery. For skin closure, there are 2 methods in practice, sutures closure, and staples. Sutures are the traditional technique, requiring a skilled doctor to tie the knots securely. A doctor uses a special needle and thread to put in stitches. Sutures are used to approximate the tissue and seal the skin. There are two types of surgical sutures which are absorbable and non-absorbable. Out of which non-absorbable sutures are more commonly used in the approximation of incision. Non-absorbable sutures include nylon, polypropylene, surgical steel and polyester. Subcuticular sutures, which can be either absorbable or non-absorbable and are often intradermal stitches put right beneath the epidermis to tighten it, are thought to be more appropriate since they induce minimal tissue reactivity (Byrne 2019).

Skin staplers are more sophisticated and advanced tools that are effective for wound closure techniques. Skin staples are used in place of sutures to increase the efficiency of fixation. Surgical skin staples are made of titanium and stainless steel. Staples (or metal clips), which are put to the external epidermis and pull the dermal edges of the wound together (Byrne 2019).

Using sutures and staples to close the thyroidectomy incision might result in several issues related to the amount of time needed for wound healing, the accuracy of the method, and the type of material being utilized and patients' overall satisfaction. Patients are affected differently by both procedures in terms of postoperative pain, allergic reaction or surgical site infection. Moreover, common complications of thyroidectomy are hypocalcemia, recurrent laryngeal nerve paralysis, hemorrhage and infection are encountered after thyroidectomy and a benign granulomatous inflammatory foreign body reaction (Neerav 2018).

Pain intensity post-operatively has a great impact after a surgical procedure it can also lead to hypertension which can increase the risk of bleeding at surgical site and cause wound drainage. Surgical site infections are rare in thyroidectomy however multiple complications related to closure techniques can occur. Surgical site complications usually arose before discharge including the following: blood transfusion, hematoma formation, pneumonia, and cardiac arrest, etc (Chai et al., 2016).

Stures and staples for closing the thyroidectomy incision have many effects on results. They vary in pain intensity, wound drainage and patient's overall satisfaction. So, a study to determine the best closure method with minimum effects after thyroidectomy was conducted to find the most appropriate method (Păduraru et al., 2019).

The findings of this study hold significant implications for the field of thyroid surgery and wound closure techniques. By providing evidence-based data on the outcomes of sutures versus staples, this research can guide surgeons in making informed decisions that maximize patient safety, improve wound healing, and enhance cosmetic results. Moreover, as thyroidectomy is a common surgical procedure, the results of this study have the potential to impact many patients worldwide. By advancing our knowledge on skin closure techniques in thyroidectomy, this research contributes to the improvement of surgical practices, ultimately benefiting patients and enhancing their overall surgical experience.

OBJECTIVE

To compare postoperative outcomes of sutures and staples used for skin closure following thyroidectomy, including pain intensity, wound complications, patient comfort, and cosmetic appearance.

METHODOLOGY

Study Design

This was prospective observational study. Patients were allocated to suture or staple closure based on surgeon preference.

Study Setting

This study was conducted in the E.N.T (Ear, Nose, and Throat) Department of Surgery, Shalamar Hospital, Lahore.

Study Duration

This study was completed within the duration of 6 months after the approval of synopsis.

Sample Size/ Statistically Power

The sample size was calculated by using the following formulae Two Proportions

n(?(Z?_(1-a/2)^2+Z_(1-ß)^2)(P_1 (1-P_1)+P_2 (1-P_2)))/(P_1-P_2)^2 Z1-a/2 95.0%
Z1-ß 80.0%

P1 Proportion of sutures closure is 7.1% P2 Proportion of staples closure is 14.3%
In this comparative prospective study, 101 patients were included therefore two groups, i.e., 101 patients, 53 patients in group A with sutures and 48 patients in group B with staples, will be enrolled for this study.

Sampling Technique
Non-probability purposive sampling technique was used.

Inclusion Criteria
- Patients with a confirmed diagnosis of thyroid disease necessitating thyroidectomy, such as thyroid cancer, multinodular goiter, or hyperthyroidism.
- Patients of age 18 years to 65 years with any skin type undergoing thyroid surgery.

Exclusion Criteria
- Patients with a previous history of open wound neck surgery.
- Patients who are diabetic and have ongoing skin or other infections.
- Pregnant patients are excluded.

Data Collection Procedure
After SSAHS–IRB (Ref No: SIHS/IRB/2023/017) was approved, data was collected from the patients of (Ear, Nose and Throat) ENT surgical department of Shalamar hospital, Lahore Pakistan. After explaining the objectives of the study, to the postoperative team and patients they were requested for their voluntary participation in this study. For those who volunteered to be study participants, written consents were taken from them along with the study questionnaire. The consent was taken from them by giving them brief information about the research program. Two groups A and B were formed. Group A belong to those patients who undergo suture closure after thyroidectomy and group B belong to those patients who undergo staple closure. To check the postoperative pain, seroma, hematoma, infection, and hospital stay for patients who were treated by thyroidectomy, the assessments were performed. For postoperative pain assessment using a visual analog scale (VAS) to rate pain intensity from 0-10. Physical examination of the surgical site was done to check for seroma, hematoma drain comfort. Modified Southampton scoring system is used for postoperative wound assessment. Evaluation of ICU stay by recording the duration of stay in the hospital after surgery. All these factors were noted in every case.

Statistical Analysis
The data was collected and analyzed using SPSS 25. Numerical data like Age (18-60) was presented in the form of mean ± S.D whereas qualitative data like the postoperative pain (using a validated pain score) incidence of seroma, hematoma, drain comfort and tightness was presented in the form of frequency (percentage). The study will collect data on the following variables: age, sex, type of thyroidectomy, surgical closure, ICU need, postoperative pain (using a validated pain score), and incidence of seroma and hematoma. The data of the patients who met the inclusion and exclusion criteria will be collected from the Shalamar hospital after fulfilling parametric assumptions. To determine the association between categorical study variable 1 & categorical study variable 2 chi-square test was applied. p-value of 0.05 or less was considered as significant.

Ethical issues
Approval of the institutional ethics committee was obtained at the synopsis level of the project. At every stage confidentiality regarding the personal biodata and responses of healthcare team was ensured and assured.

RESULTS

The study was conducted over a continuous six-month period. A total number of 101 patients undergoing thyroidectomy (49 males and 52 females) were recruited for this study. All results were expressed in the form of mean ±standard deviation. All calculations were established on similar parameters.

Table 4.1: Frequency and percentage of male and female ratio.

Gender	Frequency	Percent
Female	52	51.5
Male	49	48.5
Total	101	100.0

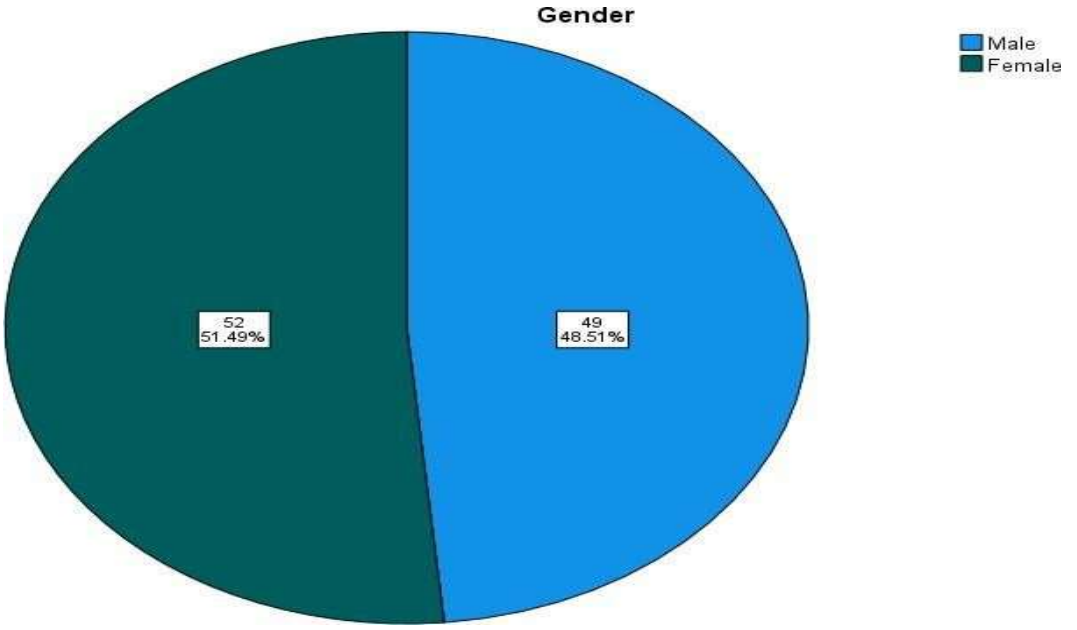

Figure 4.1: Total Frequency of Patients in Pie Chart.

T-Test

The study was conducted among total number of 101 patients undergoing thyroidectomy (49 males and 52 females). Mean age of males were 36.80±11.49 and females were 38.67±10.68. All results were expressed in the form of mean ±Standard deviation. All calculations were established on similar parameters.

Table 4.2 Mean age of male and female.

	Male	Female	p-value
Age	36.80±11.49	38.67±10.68	0.397

Independent Samples Test

Mean age of male was 36.80±11.49 years and mean age of female was 38.67±10.68 years but the age difference was not statistically significant (p-value 0.397).

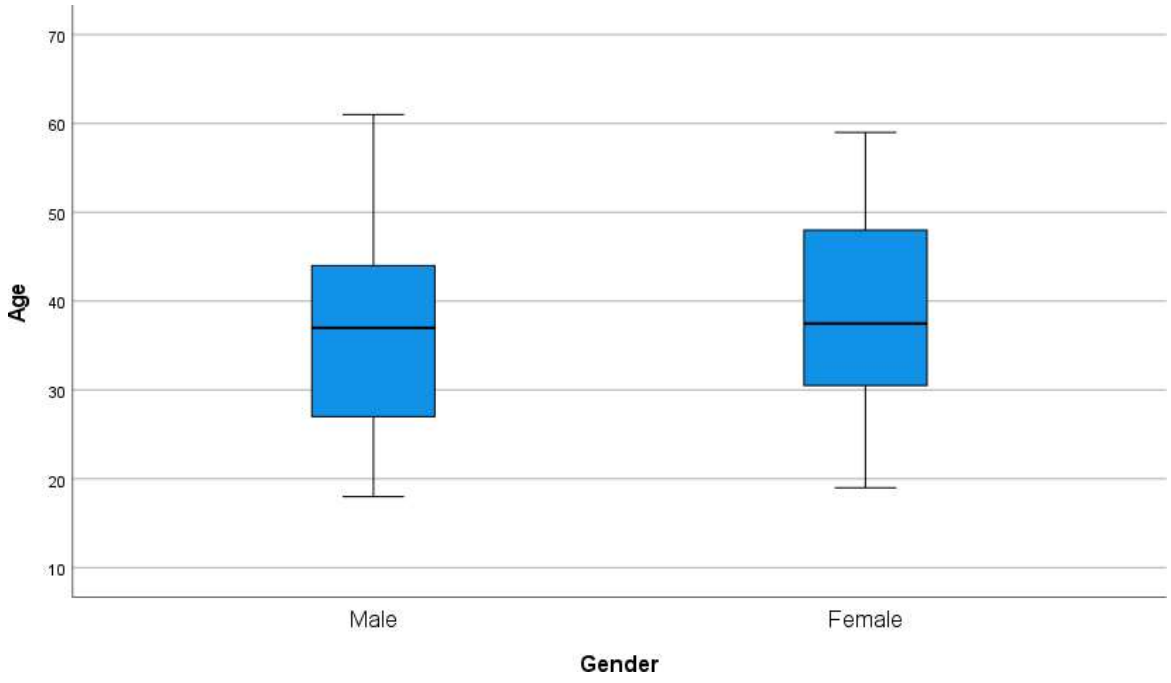

Figure 4.2: Mean age of male and female in Box Plot chart.

Table 4.3: Compare treatment Group among gender.

The study was conducted among total number of 101 patients undergoing thyroidectomy. Sutures and staples were used on them on surgeon preference. 53.1% sutures and 46.9% staples were used on males while, 51.9% sutures and 48.1% staples were used on females. Pearson Chi- Square test was used to made calculations. Hence, p-value (p-value 0.909) showed that there is no association between gender and treatment group.

	Treatment Group		
Gender	**Suture**	**Staples**	**Total**
Male	26(53.1%)	23(46.9%)	49
Female	27(51.9%)	25(48.1%)	52
Total	53(52.5%)	48(47.5%)	101

Pearson Chi-Square .013a
Statistically association between gender and treatment group (p-value 0.909).

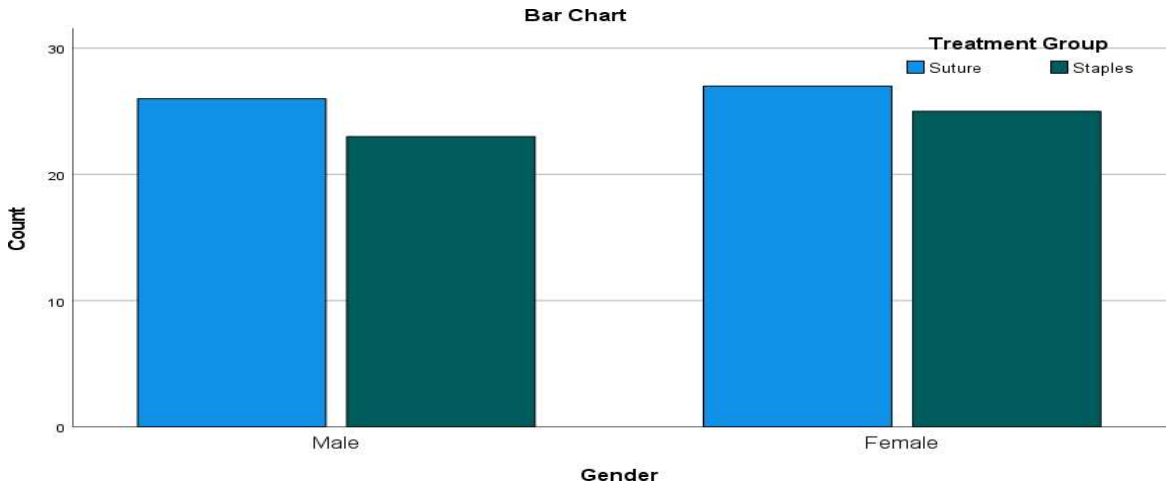

Figure 4.3: Association between gender and treatment group in Bar Chart.

Association between types of thyroidectomies and treatment group
The study was conducted among total number of 101 patients undergoing thyroidectomy. Sutures and staples were used on them according to the type of thyroidectomy. Likelihood test was used to made calculations. Hence, p-value (0.016) showed statistically association between type of thyroidectomy and treatment group.

Table 4.4: Comparison between treatment group and type of thyroidectomy.

Type of Thyroidectomy	Treatment Group		
	Sutures	Staples	Total
Total Thyroidectomy	5(9.4%)	16(33.3%)	21(20.8%)
Partial Thyroidectomy	4(7.5%)	1(2.1%)	5(5.0%)
Thyroid Lobectomy	22(41.5%)	12(25.0%	34(33.7%)
Thyroid Lobectomy with Isthmectomy	9(17.0%)	7(14.6%)	16(15.8%)
Partial Thyroid Lobectomy	11(20.8%)	6(12.5%)	17(16.8%)
Subtotal Thyroidectomy	2(3.8%)	6(12.5%)	8(7.9%)
Total	100.0%	100.0%	100.0%

Likelihood Ratio 14.561

Statistically association between type of thyroidectomy and treatment group (p-value 0.01016)

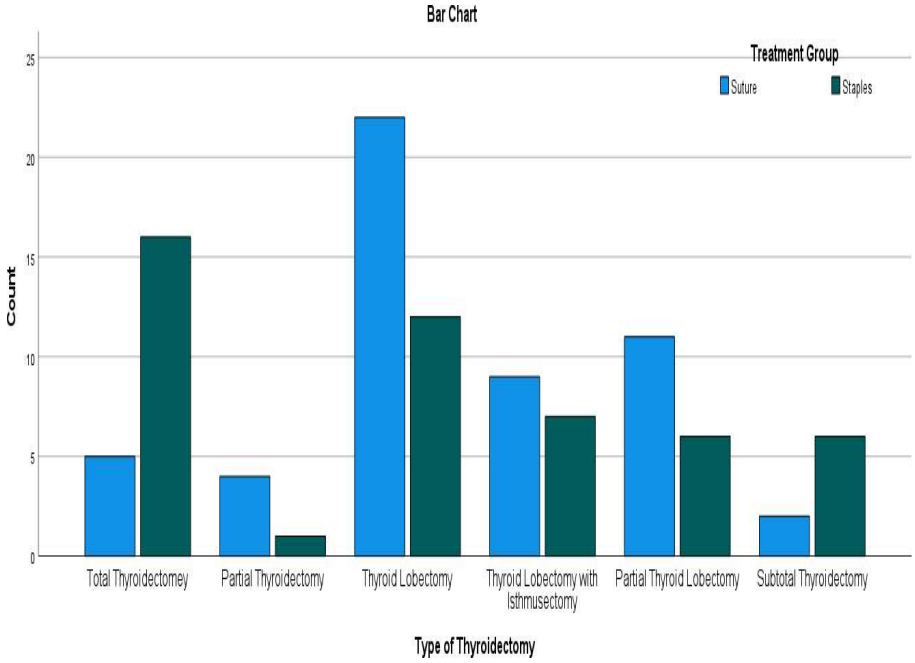

Figure 4.4: Association between type of thyroidectomy and treatment group in Multiple Bar Chart.

Association between seroma and treatment group

The study was conducted among total number of 101 patients undergoing thyroidectomy. Sutures and staples were used on them to assess different outcomes. Pearson Chi-Square test was used for calculations. Hence, p-value (0.563) showed Statistically no association between seroma and treatment group.

Table 4.5: Comparison between treatment group and seroma.

	Treatment Group		
Seroma	**Suture**	**Staples**	**Total**
Absent	29(54.7%)	29(60.4%)	58(57.4%)
Present	24(45.3%)	19(39.6%)	43(42.6%)
Total	53(100.0%)	48(100.0%)	101(100.0%)

Pearson Chi-Square .335[a]

Statistically no association between seroma and treatment group. (p-value 0.563.)

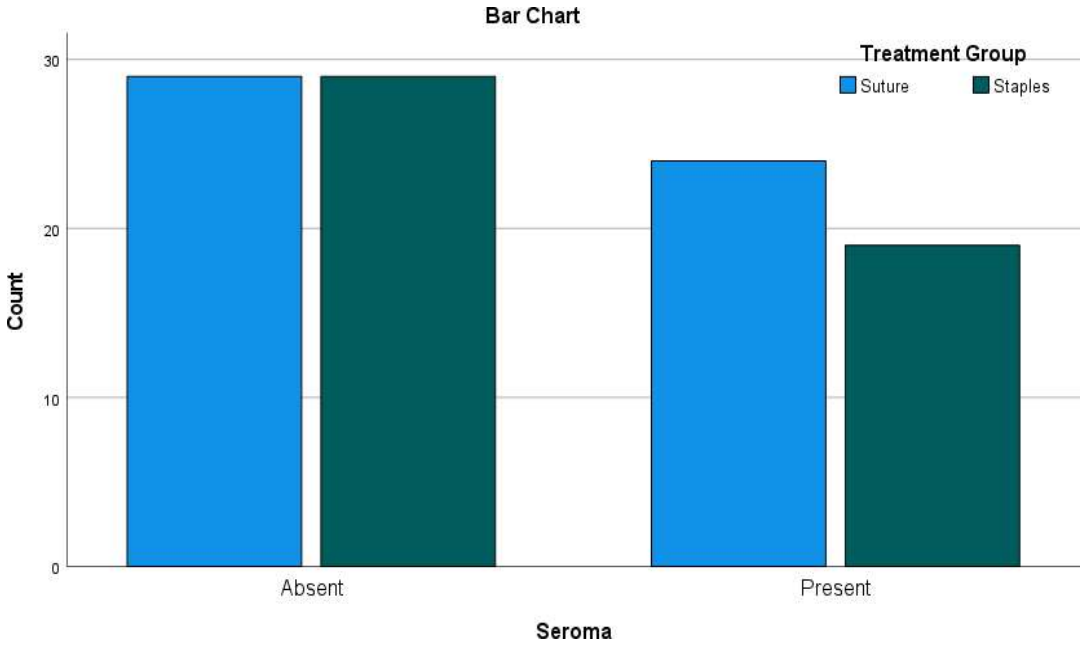

Figure 4.5: Association between seroma and treatment group in Bar Chart.

Association between tightness and treatment group

The study was conducted among total number of 101 patients undergoing thyroidectomy. Sutures and staples were used on them to assess different outcomes. Pearson Chi-Square test was used to made calculations. Hence, p-value (0.582) showed Statistically no association between tightness and treatment group.

Table 4.6: Comparison between treatment group and tightness.

Tightness	Treatment Group		
	Suture	**Staples**	**Total**
Absent	28(51.9%)	27(57.4%)	54(54.5%)
Present	25(48.1%)	20(42.6%)	45(45.5%)
Total	53(100.0%)	47(100.0%)	101(100.0%)

Pearson Chi-Square .304a
Statistically no association between Tightness and Treatment group (p-value 0.582).

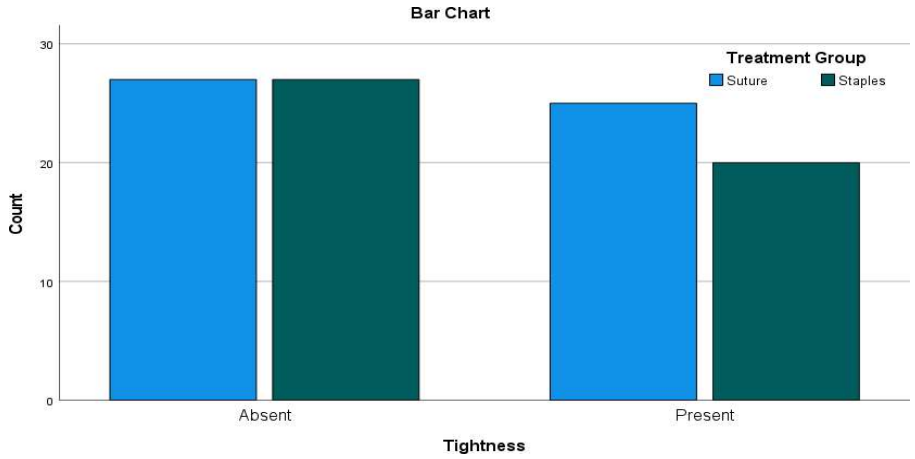

Figure 4.6: Comparison between treatment group and tightness in Bar Chart.

Association between drain comfort and treatment group

The study was conducted among total number of 101 patients undergoing thyroidectomy. Sutures and staples were used on them to assess drain comfort with treatment group. Pearson Chi-Square test was used to made calculations. Hence, p-value (0.139) showed Statistically no association between drain comfort and treatment group.

Table 4.7: Comparison between treatment group and drain comfort.

Drain comfort	Treatment Group		
	Suture	**Staples**	**Total**
Absent	22(41.5%)	27(56.3%)	49(48.5%)
Present	31(58.5%)	21(43.8%)	52(51.5%)
Total	53(100.0%)	48(100.0%)	101(100.0%)

Pearson Chi-Square 2.191[a]
Statistically no association between drain comfort and treatment group (p-value 0.139).

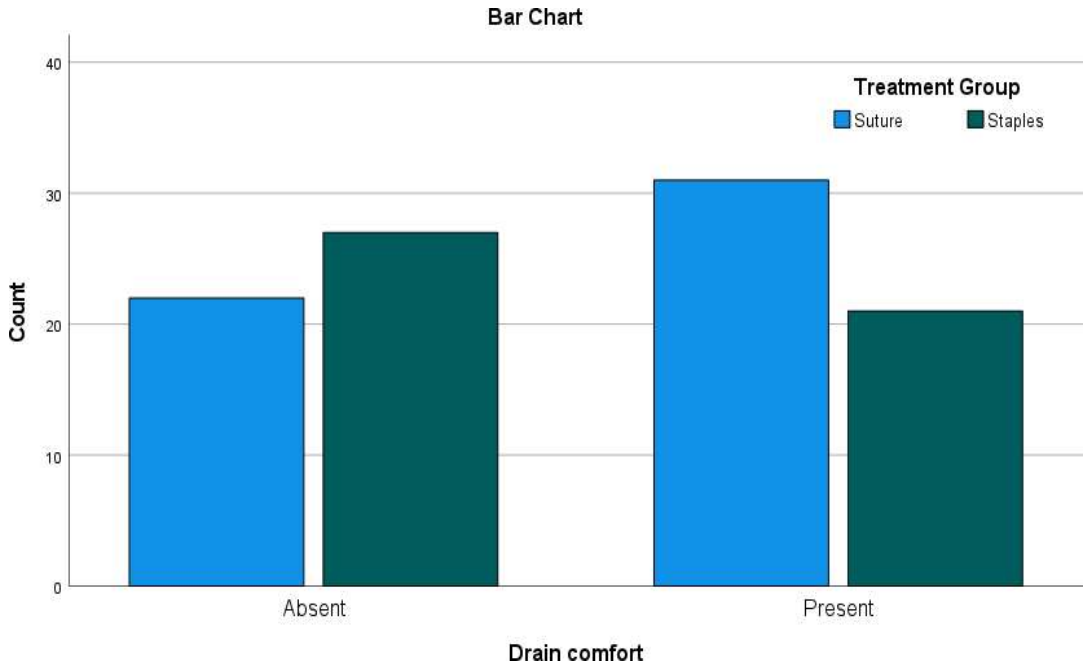

Figure 4.7: Comparison between treatment group and drain comfort in Bar Chart.

Association between need of ICU and treatment group

The study was conducted among total number of 101 patients undergoing thyroidectomy. Sutures and staples were used on them to assess the association between treatment group and if there is need of ICU. Pearson Chi-Square test was used to made calculations. Hence, p-value (0.295) showed Statistically no association between need of ICU and treatment group.

Table 4.8: Comparison between treatment group and need of ICU.

	Treatment Group		
Need of ICU	**Suture**	**Staples**	**Total**
Absent	21(39.6%)	24(50.0%)	45(44.6%)
Present	32(60.4%)	24(50.0%)	56(55.4%)
Total	53(100.0%)	48(100.0%)	101(100.0%)

Pearson Chi-Square 1.098[a]
Statistically no association between need of ICU and treatment group (p-value 0.295).

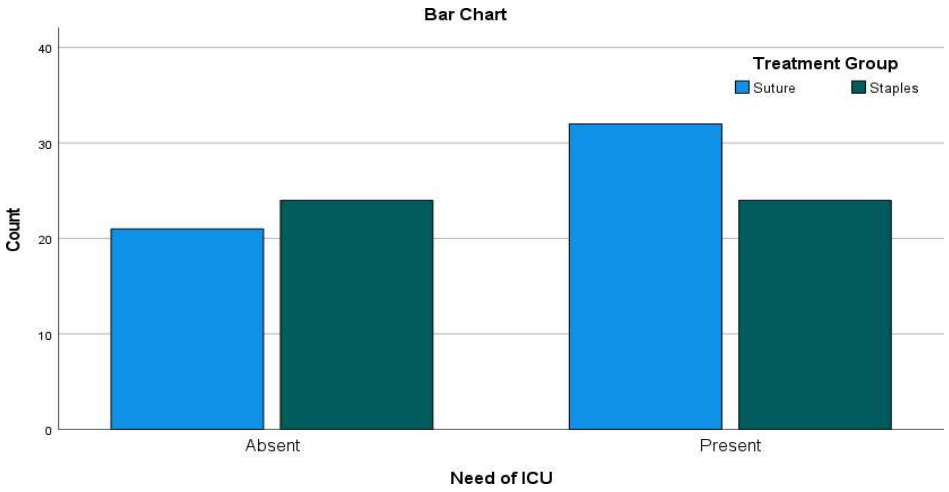

Figure 4.8: Comparison between treatment group and need of ICU in Bar Chart.

Association between Appearance grade and treatment group

The study was conducted among total number of 101 patients undergoing thyroidectomy. Sutures and staples were used on them to assess the association between treatment group and appearance grades. Pearson Chi-Square test was used to made calculations. Hence, p-value (0.131) showed that there is no association between appearance grade and treatment group.

Table 4.9: Comparison between treatment group and appearance grade.

Appearance grade	Treatment Group		
	Suture	Staples	Total
Normal Healing	11(20.8%)	7(14.6%)	18(17.8%)
Mild Bruising and Erythema	8(15.1%)	17(35.4%0	25(24.8%)
Erythema & other signs of inflammation	21(39.6%)	15(31.3%)	36(35.6%)
Clear or serous Discharge	13(24.5%)	9(18.8%)	22(21.8%)
Total	53(100.0%)	48(100.0%)	101(100.0%)

Pearson Chi-Square 5.622a

Statistically no association between appearance grade and treatment group (p-value 0.131).

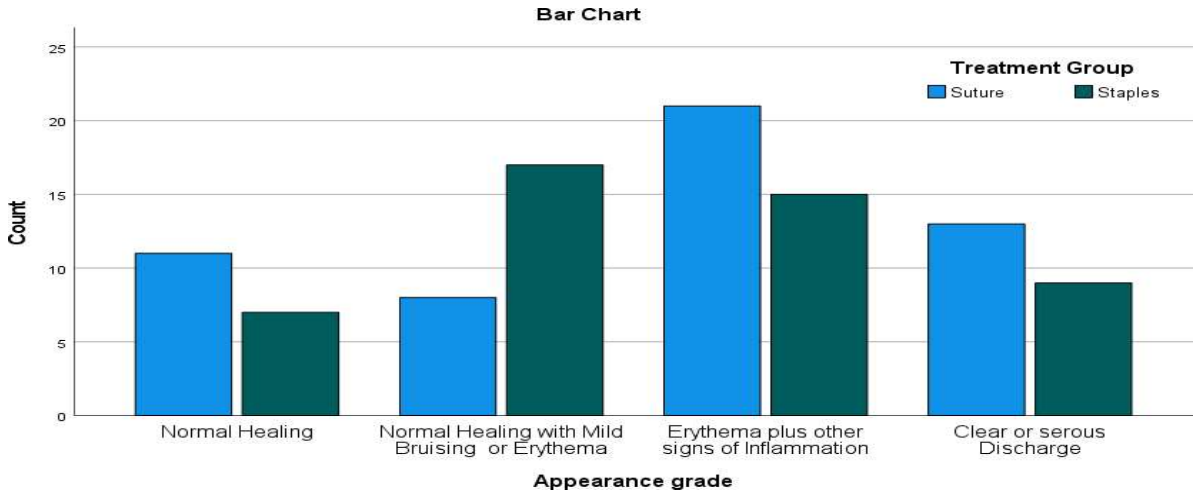

Figure 4.9: Association between treatment group and appearance grade in Bar Chart.

Association between pain grade and treatment group

The study was conducted among total number of 101 patients undergoing thyroidectomy. Sutures and staples were used on them to assess the association between treatment group and pain grade. Likelihood ratio test was used to made calculations. Hence, p-value (0.016) showed Statistically association between pain grade and treatment group. Severe or worst grades of pain were quite high with staples.

Table 4.10: Comparison between treatment group and pain grade.

Pain	Treatment Group		
	Suture	Staples	Total
No Pain	1(1.9%)	1(2.1%)	2(2.0%)
Mild Pain	27(50.9%)	16(33.3%)	43(42.6%)
Moderate Pain	15(28.3%)	7(14.6%)	22(21.8%)
Severe Pain	3(5.7%)	2(4.2%)	5(5.0%)
Very Severe Pain	5(9.4%)	15(31.3%)	20(19.8%)
Worst Pain	2(3.8%)	7(14.6%)	9(8.9%0
Total	53(100.0%)	48(100.0%)	101(100.0%)

Likelihood Ratio 13.950

Statistically association between pain and treatment group (p-value 0.016).

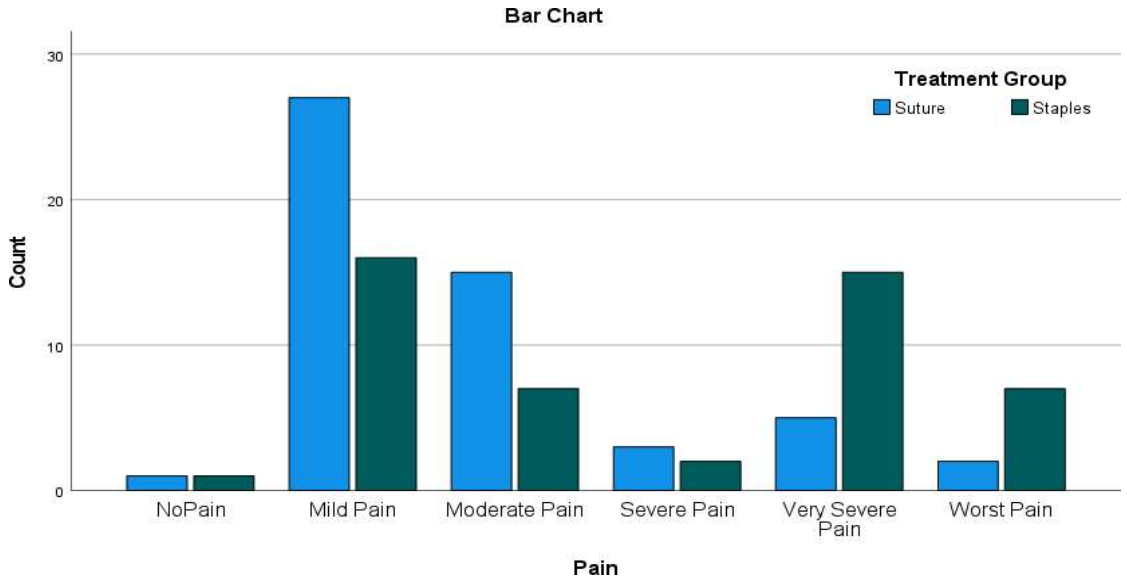

Figure 4.10: Comparison between treatment group and pain grade in Bar Chart

DISCUSSION

The present study was conducted to compare postoperative outcomes of sutures and staples used for skin closure following thyroidectomy at Shalamar Hospital, Lahore. Thyroidectomy is a common surgical procedure, and appropriate wound closure crucial in postoperative recovery, cosmetic outcomes, and patient satisfaction. In the current study, postoperative outcomes such as pain, seroma formation, wound tightness, drain comfort, ICU requirement, and wound appearance were evaluated to determine the most suitable closure technique.

A total of 101 patients were included in the final analysis, comprising 52 females (51.5%) and 49 males (48.5%). Of these, 53 patients underwent skin closure with sutures and 48 with staples. Various postoperative outcomes were observed in both groups. Seroma formation, wound tightness, and inflammatory changes were noted more frequently in the suture group, whereas better wound appearance grades were observed more commonly in the staple group. However, these differences were not statistically significant. Drain comfort and ICU requirement also did not show statistically significant differences between the two closure techniques.

Postoperative pain was the only outcome that demonstrated a statistically significant difference between the two groups, with higher pain scores observed in patients who received staples. This finding may be explained by increased skin tension and the rigid metallic nature of staples, which can contribute to localized discomfort in the early postoperative period. Nevertheless, the increased pain associated with staples was manageable with routine analgesic therapy and did not result in serious complications. These findings highlight that while staples may increase postoperative pain, this disadvantage is clinically controllable.

This study was carried out with an objective to make a clear understanding of choice of best closure technique among sutures and staples with minimum adverse outcomes after thyroidectomy. It was noted that outcomes of using sutures and staples were slightly differed. pain, bruising and erythema was measured significantly high in staples but in appearance grade and other factors like seroma, drain comfort, need of ICU, tightness, signs of inflammation and serous discharge, sutures showed more adverse outcomes in relation to staples. As, we have noted that pain was significantly high in staples that can be controlled by analgesics.

Davey et al., 2023 compared the different closure techniques outcomes after thyroid and parathyroid surgery and concluded that staples have the advantage of patient satisfaction, and cosmesis. In our study staples also showed good appearance grade and other wound infections. (Davey et al., 2023).

Pandey et al., 2022 conducted a study to compared staples and conventional sutures in surgical wounds in neck region. Staples appears to be better than conventional sutures in terms of rate of closure and scar appearance including appearance grade. Our research also showed related Results (Pandey et al., 2022).

In agreement with these studies, the present research supports that staples provide favorable cosmetic outcomes, while sutures may be associated with more inflammatory wound changes. Overall, both sutures and staples are effective skin closure techniques following thyroidectomy, and the choice should be guided by clinical judgment, patient comfort, and surgeon preference.

CONCLUSION

Conclusion is that staples demonstrated better cosmetic outcomes and reduced wound complications compared to sutures following thyroidectomy. However, higher postoperative pain scores were observed in the staple group. This pain was manageable with appropriate analgesic therapy. Therefore, both sutures and staples are effective skin closure techniques, and their selection should be individualized based on patient factors and surgeon preference.

LIMITATIONS OF THE STUDY

The limitations of the study:

- Limited number of sample size was given because the study was audit type.
- Study duration was limited to 6 months.
- The complications were noted only during hospital stay and did not follow up the patients after discharge which could give better results of post-operative outcomes.

Suggestions

Suggestions for this study are as follows:

- It is suggested to use staples over sutures according to above results.
- Patients experienced pain with staples can be managed by analgesics.
- Use of sutures and staples depends upon surgeon's preference.

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Summyya
Nimra Rafique
Saeed Ahmed

CONFLICT OF INTEREST

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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- **Vancouver**: Ahmad S, Musharaf S, Rafique N. Comparative study on sutures vs staples for skin closure in a patient undergoing thyroidectomy. *The Operating Room Global Journal (TORGJ)*. 2026 Feb 4. https://doi.org/10.64573/torgj2601004
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APPENDIX A

Post-Operative Wound Assessment in Patients Undergoing Thyroidectomy
Modified Southampton Scoring System

Type of Thyroid Surgery (Tick as applicable):

- ☐ Thyroid Lobectomy
- ☐ Thyroid Lobectomy with Isthmectomy
- ☐ Partial Thyroid Lobectomy
- ☐ Subtotal Thyroidectomy

Indication for Thyroidectomy (Tick all that apply):

- ☐ Cold nodules
- ☐ Multinodular goiter
- ☐ Cosmetic concern
- ☐ Overactive thyroid
- ☐ Hyperthyroidism
- ☐ Goiter
- ☐ Any other (specify): _____

Fine Needle Aspiration Cytology (FNAC):

- ☐ Yes
- ☐ No

If **yes**, result:

- ☐ Malignant
- ☐ Benign

Closure Details:
Type of Sutures Used:

- ☐ Absorbable
- ☐ non-absorbable

Type of Staples Used:

- ☐ Disposable
- ☐ non-disposable

Grade	Appearance	Yes	No
0	Normal healing		
1	Normal healing with mild bruising or erythema		
2	Erythema plus other signs of inflammation		
3	Clear or hem serous discharge		
4	Major complication-like pus		
5	Severe wound infection like hematoma		

APPENDIX B

Modified Post-Operative Patient Assessment Form

MR No.: _____
Age: _____
Gender: _____
Weight: _____
Date: _____

Operative Details

Type of Anaesthesia: _____
Duration of Surgery: _____
Any Previous Surgery:

- ☐ Yes
- ☐ No

Any Pre-operative Risk Factors:

- ☐ Yes (specify): _____
- ☐ No

Type of Thyroidectomy: _____

Wound Closure

Sutures Used:

- ☐ Absorbable
- ☐ Non-absorbable

Staples Used:

- ☐ Yes
- ☐ No

Post-Operative Medications

Medication Given (tick all that apply):

- ☐ Antibiotics
- ☐ Analgesics

If **Yes**, specify:

Time	Medication

If patients develop any seroma? Yes_____No _____
Pain/ Tightness at wound? Yes_____No_____
Overall comfort with wound? Yes_____No_____
Drain comfort? Yes_____No_____
Did the patient spend enough time recovering? Yes_____No_____
Was the patient sent to ICU? Yes_____No_____
Did the patient keep prolonging in recovery due to ICU being full? Yes_____No_____
Do you think patient will leave recovery with full consciousness? Yes_____No_____

APPENDIX C
Questionnaire

Assessment of Pain intensity at Incision site after Thyroidectomy
MR no_____ Age_____ Gender_____
Type of Thyroidectomy

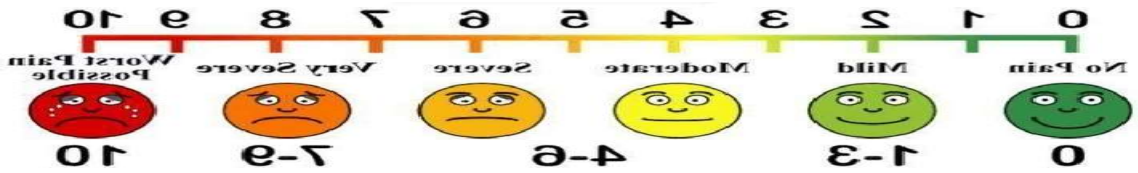
Type of surgery	Yes or no
Total Thyroidectomy	
Partial Thyroidectomy	
Thyroid Lobectomy	
Thyroid Lobectomy with Isthmectomy	
Partial Thyroid Lobectomy	
Subtotal Thyroidectomy	

Closure Material used.
Sutures_____ staples_____
Timing in Post-Operative area.

Duration	
1hr	
2hr	
3hr	
Short stay	

Patients are feeling pain at;
Swallowing_____ Speaking _____

Visual Pain Scale to assess pain at incision site



APPENDIX D: Research Participant Consent Form

Title of the Project: Comparative study on sutures vs staples for skin closure in a patient undergoing Thyroidectomy
Principal Investigator: Summyya Azeem, Nimra Rafique, Saeed Ahmed
Position: B.s Operation Theater Technology Final Year Organization: Shalamar Institute of Allied Health Sciences
Contact No: 03054439962, 03074957904, 03029565482
E -mail: saeedmalik0470@gmail.com
Co-Investigator: Fakhra Fakhr
Position: Senior lecturer Organization: Shalamar Institute of Allied Health Sciences Department: Operation Theater Technology
Contact No: 03096750438 e-mail address: Fakhrafakhar995@gmail.com

PURPOSE OF THIS RESEARCH STUDY:
To find out the best surgical technique for thyroidectomy.

PROCEDURE:
Participants will be asked to fill the proforma and written informed consent will be obtained from them. Data will be collected at general surgery operation theatre (ENT), recovery and surgical wards of Shalamar Hospital, Lahore.

TIME:
Your participation will involve one visit, approximately 5-10 minutes.

POSSIBLE RISKS OR DISCOMFORT:
Basically, there is no risk included in our study. Just we will take some duration of time for filling proforma.
POSSIBLE BENEFITS:
The research will provide valuable information to medical professionals regarding the selection of the appropriate surgical technique for individual patients. There is no financial compensation for your participation in this research.

CONFIDENTIALITY:
Your identity in this study will be treated as confidential. The results of the study may be published for scientific purposes but will not give your name or include any identifiable references to you.

TERMINATION OF RESEARCH STUDY:
You are free to choose whether to participate in this study. There will be no penalty or loss of benefits to which you are otherwise entitled if you choose not to participate. You will be provided with any significant new findings developed during this study that may relate to or influence your willingness to continue participation. In the event you decide to discontinue your participation in the study.

Authorization:
I have read and understood this form and consent to the research described to me. I volunteer to participate in this research study. I understand that I will receive a copy of this consent form for my records. I voluntarily choose to participate but I understand that my consent does not take away any legal rights in the case of negligence or other legal fault or anyone who is involved in this study. I further understand that nothing in this consent form is intended to replace my applicable, federal state or local laws.

Name & Signature of participant
Signature of principal Investigator
Signatures of person obtaining consent_____

APPENDIX E: IRB APPROVAL LETTER

Shalamar
Medical & Dental College

Institution Review Board

Shalamar School of Allied Health Sciences

Approval Letter

IORG: 0010289

REF: SSAHS IRB/AL/38/2023 Dated: 11.09.2023

IRB Number: 0574

Project Title: **Comparative Study on Sutures VS Staples for Skin Closure in Patient Undergoing Thyroidectomy**

Principal Investigators:	Nimra Rafique, Summyya Azeem, Saeed Ahmed
Review Category:	Full Board
Date Submitted:	22.05.2023
Final Amendments Submitted:	07.09.2023
Date Approval:	08.09.2023

This approval letter is valid for one year from the date of issuance. Any change in study protocol or study duration should be notified to the Board for prior approval.

This ethical approval is issued subject to the following conditions:

1. A signed personal declaration of responsibility.
2. It is Principal Investigator's responsibility to ensure that all the necessary documents including informed consent forms are retained for future reference

Dr. Farkhanda Ghafoor

Director Research & Innovation Department, SMDC

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