

Original Research Article

Comparative study of steristrips and subcuticular suture for wound closure after thyroid surgery

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ABSTRACT

Background: Any skin closure technique aims at opposing the skin edges precisely without tension for sufficient time to allow healing to take place. The ease and speed with which the skin closure is completed, the level of patient discomfort, the complication rate, and the final cosmetic result are the factors which has to be considered in making a comparison of different types of wound closure. This study aims at comparing steristrips and subcuticular sutures for wound closure after thyroid surgery based on assessment of post-operative pain, neck mobility and cosmetic appearance.

Methods: A comparative study was carried out among 90 subjects attending Department of Surgery, K. R. Hospital, Mysuru over a period of 10 months. Subjects of either sex undergoing thyroidectomy will be randomized to had their wounds closed by steristrips or subcuticular sutures using a simple randomization table. Patients who underwent previous neck irradiations, secondary neck surgeries, and patients with poor compliance were excluded from the study. Descriptive statistics, unpaired t-test and chi-square test were used to analyse the results.

Results: The mean age group of the study subjects was 48.6 (range 24-76) years. The gender distribution showed a higher number of females (82) as compared to males (8). 70 patients were diagnosed with multinodular goitre, 16 patients were of thyroid neoplasms and 4 were of inflammatory thyroid conditions. 12 patients underwent subtotal thyroidectomy and 78 patients underwent total thyroidectomy. Wound closure by steristrips had less post-operative pain, acceptable neck mobility and excellent scar appearance as compared to subcuticular sutures.

Conclusions: The choice of materials for wound closure will depend on the surgeon's preference. However, this study does show that steristrips sutures can be removed more quickly and is more acceptable method of wound closure as compared to subcuticular sutures after thyroid surgery.

Keywords: Neck incisions, Thyroid neoplasm, Thyroidectomy, Wound closure

INTRODUCTION

Wound healing, the body's response to tissue injury, is an essential and primitive process common to all multicellular organisms wherein a principal type of cell assumes embryonic features, undergoes migration, divides and then differentiates to produce an extracellular matrix in a seemingly less than optimal or hostile environment.¹ Surgeons have pursued the search for an ideal suture material suitable for all purposes since the

time of Pare.² The choice of suture material in primary wound closure may have a significant bearing on the success of the subsequent wound repair.³ In the selection of a suture, a patient's health status, age, weight and comfort, and the presence or absence of infection are as important as the biomechanical properties of the suture, individual wound characteristics, anatomic location, and a surgeon's personal preference and experience in handling a suture material. There is often more than one appropriate method of closure.⁴

Cosmetic appearance of the scar is one of the most important outcomes of wound repair.⁵ Skin closure technique aims at precisely opposing the skin edges without tension for sufficient time to allow healing to take place. Many factors such as complication rate, the ease and speed with which the skin closure is completed, the level of patient discomfort and the final cosmetic result become significant when considering cervical collar incisions.⁶ The placement of a subcuticular suture probably requires more technical expertise than with steristrips although not formally assessed. Steristrips are suitable for superficial laceration of face and fingers. They cannot be used whenever there is tension in wound or significant moisture.⁷

METHODS

After obtaining Institutional ethical committee approval, a prospective, open label, randomized, comparative, single centered study was conducted among 90 subjects attending General Surgery OPD, K. R. Hospital, Mysuru meeting the inclusion and exclusion criteria over a period of 10 months (January to October 2016) after obtaining a written informed consent using a purposive sampling

technique. Patients undergoing thyroidectomy were randomized to had their wounds closed by subcuticular sutures or steristrips based on simple randomization table. Postoperative pain is assessed by verbal response and visual analogue scale for 3 consecutive post-operative days, neck mobility is assessed at 48 hours and one week after surgery using verbal and visual analogue scale and assessment of cosmetic appearance will be done by using visual analogue scale at the time of 6th week. Subjects of either sex undergoing thyroidectomy in Department of Surgery, K. R. Hospital, Mysuru over a period of 10 months were included in the study. Patients with history of previous neck irradiations, secondary neck surgeries, and patients with poor compliance are excluded from the study. Descriptive statistics, unpaired t-test and chi-square test were used to analyse the results.

RESULTS

Over all 70 patients of colorectal malignancies were During the ten months study period, 45 patients had steristrips closure and 45 patients had there wound closed by subcuticular sutures.

Table 1: Verbal analogue scale for pain (day 1).

	Closure types		Total
	Steristrips	Subcuticular suture	
1 count (%)	41 (91.1%)	34 (75.6%)	75 (83.3%)
2 counts (%)	4 (8.9%)	11 (24.4%)	15 (16.7%)
Total count (%)	45 (100%)	45 (100%)	90 (100%)

P value is significant at 0.003

Table 2: Verbal analogue scale for pain (day 2).

	Closure types		Total
	Steristrips	Subcuticular suture	
0 count (%)	42 (93.3%)	38 (84.4%)	80 (88.9%)
1 count (%)	3 (6.7%)	6 (13.3%)	9 (10%)
2 counts (%)	0	1 (2.2%)	1 (1.1%)
Total count (%)	45 (100%)	45 (100%)	90 (100%)

P value is significant at 0.012

Table 3: Verbal analogue scale for pain (day 3).

	Closure types		Total
	Steristrips	Subcuticular suture	
0 count (%)	44 (97.8%)	36 (80%)	80 (88.9%)
1 count (%)	1 (2.2%)	9 (20%)	10 (11.1%)
2 counts (%)	0	0	0
Total count (%)	45 (100%)	45 (100%)	90 (100%)

P value significant at 0.02

The mean age group of the study subjects was 48.6 (range 24-76) years. The gender distribution showed 82 females (91.1%) as compared to 8 males (8.89%). 70

patients were diagnosed with multinodular goitre, 16 patients were of thyroid neoplasms and 4 were of inflammatory thyroid conditions. 12 patients underwent

subtotal thyroidectomy and 78 patients underwent total thyroidectomy. Steristrips group experienced less pain as compared to subcuticular sutures in verbal analogue scale on first three post-operative days (Table 1-3). Visual

analogue scale for wound closed by steristrips also showed less pain on first three postoperative days (Table 4-6).

Table 4: Visual analogue scale for pain (day 1).

	Closure types		Total
	Steristrips	Subcuticular suture	
0 count (%)	2 (4.4%)	0	2 (2.2%)
1 count (%)	37 (82.2%)	24 (53.3%)	61 (67.8%)
2 counts (%)	6 (13.3%)	21 (46.7%)	27 (30%)
3 counts (%)	0	0	0
4 counts (%)	0	0	0
Total count (%)	45 (100%)	45 (100%)	90 (100%)

p value significant at 0.014

Table 5: Visual analogue scale for pain (day 2).

	Closure types		Total
	Steristrips	Subcuticular suture	
0 count (%)	33 (73.3%)	1 (2.2%)	34 (37.8%)
1 count (%)	10 (22.2%)	28 (62.2%)	28 (31.1%)
2 counts (%)	2 (4.4%)	16 (35.6%)	18 (20%)
3 counts (%)	0	0	0
Total count (%)	45 (100%)	45 (100%)	90 (100%)

p value significant at 0.036

Table 6: Visual analogue scale for pain (day 3).

	Closure types		Total
	Steristrips	Subcuticular suture	
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 Count (%)	45 (100%)	45 (100%)	90 (100%)

p value significant at 0.014

Table 7: Verbal analogue scale for neck mobility (after 48 hours and 7 days).

		N	Mean	SD	Kruskal Wallis test value	p Value
Neck mobility after 48 hours	Steristrips	45	0.18	0.286	66.084	0.000
	Subcuticular	45	0.44	0.338		
	Total	90	0.62	0.624		
Neck mobility after 7 days	Steristrips	45	0.03	0.123	5.436	0.026
	Subcuticular	45	0.03	0.123		
	Total	90	0.06	0.246		

p value significant at 0.004

Table 8: Visual analogue scale for neck mobility (after 48 hours and 7 days).

		N	Mean	SD	Kruskal Wallis test value	p Value
Neck mobility after 48 hrs	Steristrips	45	0.555	0.216	66.584	0.000
	Subcuticular	45	0.725	0.428		
	Total	90	1.28	0.644		
Neck mobility after 7 days	Steristrips	45	0.03	0.162	5.862	0.026
	Subcuticular	45	0.03	0.162		
	Total	90	0.06	0.324		

p value significant at 0.028

Steristrips group had easy neck mobility compared to subcuticular sutures in verbal analogue scale for neck mobility after 48 hours and 7 days (Table 7). Visual analogue scale had similar results with easy neck

mobility as compared to subcuticular sutures after 48 hours and 7 days (Table 8). Visual analogue scale for cosmetic appearance after 6 weeks closed by steristrips was superior to subcuticular sutures (Table 9).

Table 9: Visual analogue scale for cosmetic appearance (after 6 weeks).

		Closure types		Total
		Steristrips	Subcuticular suture	
Cosmetic appearance after 6 weeks	Excellent	43 (95.6%)	36 (80%)	79 (87.8%)
	Good	2 (4.4%)	9 (20%)	11 (12.2%)
Total		45 (100%)	45 (100%)	90 (100%)

p value significant at 0.005

DISCUSSION

Long term aesthetic appearance of the scar is one of the most important outcomes of wound repair. The aim of thyroid surgeries is to achieve the healing with no discharge or infection, minimal oedema and scarring.⁸ Having good vascular supply neck incisions heal very quickly, allowing us to remove the sutures early and we had never experienced any problems in doing this on third postoperative day. It is earlier than usual for removal of sutures but had shown success from the final cosmetic appearance with visual linear analogue scores.⁹

In the present study wound closure by steristrips had less post-operative pain as compared with subcuticular sutures. In a study by Selvadurai et al, thirty-eight patients were randomized to the Michel clip group and 42 to the subcuticular suture group and the two groups were well matched for age, sex, race, thyroid to parathyroid surgery ratio, thyroid and parathyroid diagnosis, degree of thyroid resection.¹⁰ Patients in the metal clip and subcuticular suture groups experienced similar degrees of pain on the first 3 postoperative days and there were no statistically significant differences between the two groups using either visual analogue or verbal response scale.

In present study, steristrips had acceptable neck mobility after thyroid surgery compared to subcuticular sutures. In a study DM Ridgway et al, Glued (n = 14) and stapled (n = 15) closures were performed for hemithyroidectomy (n = 8 versus 6), sub-total thyroidectomy (n = 2 versus 4), total thyroidectomy (n = 1 versus 4) and parathyroidectomy (n = 3 versus 1).¹¹ Closure with tissue glue took significantly longer than with staples (mean, 95 versus 28 s; P <0.001). Neck mobility scores were comparable at 48 hours and 1 week (mean, 4.8 versus 4.4; P = 0.552: and 2.7 versus 2.6; P = 0.886). The use of glued skin closure may increase the duration of surgery but acceptable neck mobility.

In present study, wound closure with steristrips had excellent scar appearance followed by subcuticular sutures. In a study Yang YL et al, these patients were

randomly divided into two groups (one experimental and one control group) of 70 patients each.¹² In the process of the study, 8 patients were excluded because of intraoperative findings. Therefore, there were 65 patients in the experimental group (tissue adhesive) and 67 patients in the control group (surgical staples). The objective of this study was to compare the effectiveness and cosmetic results of tissue adhesive or surgical staples in thyroidectomy through a supraclavicular incision. At the first month after surgery, the score was significantly lower in the experimental group (range: 5-7) compared to that of control group (r: 8-10; P <0.001). But at the third month after surgery, there was no significant difference between the two groups.

CONCLUSION

The choice of wound closure materials will finally depend on the surgeon's preference. However, this study does show that steristrips sutures had less pain, acceptable neck mobility, excellent scar appearance followed by subcuticular sutures.

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