ORIGINAL ARTICLE

Comparison of Harmonic Scalpel Method With Conventional Procedure for Hospital Stay During Thyroidectomy among Pakistani Patients

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ABSTRACT

Background: In general surgery thyroidectomy is the most common operative procedure. Hospital stay of patients after surgery depends on the method adopted during it. In conventional method, silk sutures are employed.
Aim: To compare the hospital stayof Pakistani patients with multi-nodular goiter undergoing thyroidectomy with harmonic scalpel versus Conventional suture method.
Study design: It was prospective randomized controlled trial.
Methodology: All patients (60) underwent thyroidectomy for Multinodular goiter were distributed into two assemblies, In Group-A, harmonic scalpel ligatedall thyroid vessels.In Group-B, inferior middle and superior were tied using silk sutures3/0, and all other vessels were sutured by 4/0 or electro cauterized.The two groups were compared for post-operative hospital stay.
Results: The mean hospital stayof patients in group-A was 2.9±0.8 days and in group-B was 4.2±0.7days with *p*-value of 0.00002 which is statistically significant.
Conclusion: Harmonic scalpel can be employed regularly as significant reduction in hospital stay was seenafter thyroidectomy.
Keywords: Harmonicscalpel, Multinodulargoiter, Thyroidectomy.

INTRODUCTION

The most common procedure in general surgery isthyroidectomy. Thyroid gland is a highly vascular organ, so duration of hospital stay of patients depends on proper hemostasis post-operatively. Generally, hemostasis is secured by using ties and sutures, but this method is time consuming[1].

Worldwide, it is estimated that goiter affect as many as 200 million people who have a diet deficient in iodine. In the Wickham study from the United Kingdom, 16% of thepopulation had a goiter[2]. In the Framingham study, ultrasonography revealed 3% of men above 60 years had thyroid nodules[3]. In one German study, 432 out of 635 (68%) subjects hadthyroid nodules when screened. In another previous German study, ultrasonographic screening of more than 90,000 people detected thyroid nodules in 33% of the normal population[4].

Goiter is an enlarged thyroid gland.It can be diffused or multinodular. It can be caused by iodine deficiency, goitrogens and genetically synthetic thyroid disorders resulting in high production of thyroid stimulating hormone (TSH). Thus cellularity and hyperplasia of the thyroid glandoccur leading to goiter development[5].

Medical as well as surgical procedures including thyroidectomy are available as goiter treatment options. Surgery is indicated in multi-nodular goiter and for risk of or confirmed thyroid malignancies[6]. It requires safe dissection, meticulous hemostasis, recurrent laryngeal nerve injury and to avoid airway embarrassment[7]. In conventional procedures, a risk of slippage of ligature remains leading to re-exploration of operative wound. It results in increased morbidity[8].

Short operative time as well as less duration of hospital stay for the patients after surgical procedurearethe need of hour due to heavy work load in a tertiary hospitals. Thus, there is a trend of short hospital stay with use of modern methods[9,10]. Harmonic scalpel (HS) is a modern method as it is safe and effective with good hemostatic control[11]. It has limitations like it's an expensive instrument and experience is required for its use[12].The current project was designed to investigate theduration of hospital stayin patients having thyroidectomy for multinodular goiter with harmonic scalpel method.

METHODOLOGY

In current study,enrolled patients were 60(30 in each group) by using 95% confidence level and 80% power of test. They were enrolledfrom April-October 2018in the Department of General Surgery, Allama Iqbal Memorial Teaching Hospital, Sialkot. The study design was prospective randomized controlled trial**.** Only patients fulfilling the inclusion criteria i.e., diagnosed with multi-nodular goiter, both genders (16-60 years) were included in the current study. Ethical Committee of hospital approval was taken. Written informed consent was taken from all the patients.In Group-A, harmonic scalpel ligatedall thyroid vessels.In Group-B, inferior middle and superior were tied using silk sutures3/0, and all other vessels were sutured by 4/0 or electro cauterized.The two groups were compared for theirpost-operative duration of hospital stay.

Statistical Analysis: All the data were entered and processed by using SPSS v23.0. The age and hospital stay were described by using mean and standard deviation. Gender was described by using frequencies and

percentages. Data was stratified for gender to deal with effect modifiers. Post-stratification, student *t*-test was used. A *p*-value of ≤ 0.05 was considered significant.

RESULTS

Patients (60) were divided in two equal groups i.e.Group-A (Harmonic Scalpel) and Group-B (Conventional Technique). Gender distribution (Table 1). Percentages of patients in different age ranges among group A and group B are shown below (table-2). Hence age groups were compared. Comparison between two groups showed long hospital stay (days) happened in conventional technique. Results are summarized below (table-3). Difference in hospital saty was significant. Stratification was done for the hospital stay between groups with respect to gender. Results were summarized in table 4.

Table 1: Comparison of gender distribution between groups

Genders	Harmonic Scalpel (n=30)	Conventional Technique (n=30)	Total
Male (16)	9 (30%)	7 (23.33%)	16 (26.70%)
Female (44)	21(70%)	23(76.70%)	44 (73.30%)

Table 2: Comparison of age groups between groups

Age group (years)	Harmonic scalpel	Conventional technique	Total
16-30	8(26.7%)	15(50%)	23(38.3%)
31-45	9(30%)	7(23.3%)	16(26.7%)
46-60	13(43.3%)	8(26.7%)	21(35%)
Total	30(100%)	30(100%)	60(100%)

Table-3: Comparison of duration of hospital stay between groups (days)

	Harmonic Scalpel (n=30)	Conventional Technique (n=30)	*P value*
Hospital stay (days)	2.90 ±0.80	4.20 ± 0.76	0.00001*

*Statistically Significant

Table-4: Stratification of comparison for hospital stay between groups with respectto gender (days)

	Harmonic Scalpel (30)		Conventional Technique (30)		
	N	Mean	n	Mean	*P* value
Male	9	2.89 ±0.78	7	4.29 ± 0.76	0.003*
Female	21	2.90 ± 0.83	23	4.17 ± 0.78	0.0001*

*Statistically Significant

DISCUSSION

Through this study, an attempt was made to study the duration of hospital stayof patients undergoing thyroidectomy with harmonic scalpel method versus Conventional suture method. This study suggested that there is a significant reduction post-thyroidectomy hospital stay with harmonic scalpel. Hence, highest importance lies with the preventionof any complications and short hospital stayafter thyroid surgery.

Method of enrollment was adopted in this research with some modifications (14). Pakistanipatients withdiagnosed multinodular goiter were admitted from April-October 2018in the Department of General Surgery to volunteer in current study. A written consent was taken from all the subjects. For traceability Identifiable codes were given to them.

Our sample size was 60 patients as in other studies 80 sample size was kept (14). In contrast, another study was carried thatincluded 100 goiter patients in his study (15). Hence, our work was similar as others previously.

In our study, both male and female patients with multinodular goiter were voluntarily enrolled. Males were 26.70% while females were 73.30% in present project. In other study, patients with multinodular goiter, that included 19% men and 81% women. Female gender dominated in both studies. Hence, our work was in line with previous studies[15].

Same methodology was adopted in our project as documented in one previous study with some modifications. Patients were divided randomly into 2 sets. The patients in group-I (n=40), the patients received conventional knot tying technique during thyroidectomy; in group-II (n=40), the harmonic scalpel method was employed for the procedure (14). Hence, our work was in line with previous studies.

Mean duration of hospital stay in our setting was 2.90 ±0.80 post-thyroidectomy by harmonic scalpel whereas 4.20 ± 0.76 was observed in the tie and clip group with a significant P-value of 0.0001. There was a significant difference in duration of stay at hospital in our study. Paradoxically, in one study carried in Europe, there was no difference in hospital stay among two compared groups. Duration of stay was 2days in both groups (15).Duration of stay following conventional technique in our setting is more because of many reasons like hygiene issues, facilities and lack of advancement in our medical setups.

Limitations: We admit that our study had a number of limitations. It included too small sample size and financial constrains with lack of resources.

Strengths: Current study, compared modern technique with conventional procedure for duration of hospital stay during thyroidectomy among pakistani patients. No comparable similar study is available among Pakistani population for hospital stay post-thyroidectomy by harmonic scalpel.

CONCLUSION

Harmonic scalpel provides a safe method for thyroidectomy with short duration of hospital stay post-operatively.

Running head: Hospital stay with harmonic scalpel in thyroid surgery.

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