

ORIGINAL ARTICLE

Comparison of the Outcome of Clamp-and-Tie with Ligasure Technique in Total Thyroidectomy

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ABSTRACT

Objective: To compare the outcome of clamp-and-tie with Ligasure technique in total thyroidectomy patients.

Material and Methods: A total 60 (30 in each group) patients undergoing near total thyroidectomy for benign goitre were included in this study. After taking informed consent, demographic data (age, gender, duration of goitre, place of living and BMI) were noted. All selected cases were divided into group A & B by lottery method. In group A patients total thyroidectomy was done by using ligasure while in group B patients, near total thyroidectomy was done by clamp-and-tie technique. Operation time and intra-operative blood loss were measured for each patient.

Results: Mean age of patients was 45.60±12.1 years included in this study. Mean disease duration was 7.8±4.5 months. Mean BMI was 24.80±3.61 kg/m². There were 43 (71.67%) females and 17 (28.33%) male patients. There were 13 (21.67%) patients were from rural area and 47 (78.33%) were from urban area. Mean operative time in group A was 61.33±5.98 hours versus 75.06±6.61 hours in group B (p-value <0.001). Mean intra-operative blood loss was 53.40±6.11 ml in group A versus 81.47±9.29 ml in group B (p-value <0.001).

Conclusion: Thyroid surgery with Ligasure resulted in dramatically reduced mean operational time and postoperative blood loss compared to traditional approach.

Keywords: clamp-and-tie technique, Ligasure, total thyroidectomy.

INTRODUCTION

About 20 million Pakistanis live in endemic regions and are thus at risk of developing thyroid problems.¹ There are many cases of benign thyroid illness in our nation, especially among the female population and those who live in iodine-starved regions.² The treatment of choice for thyroid cancers has been total thyroidectomy. It has lately been hailed as the gold standard for surgical treatment of benign thyroid diseases.³ The American Thyroid Association estimates that around 150,000 people in the United States have their thyroid glands removed each year due to benign or malignant conditions.⁴

Because of its vascularization and proximity to key organs, thyroid gland procedures were linked with hazardous consequences prior to the nineteenth century. As a result, reported complication rates in the literature ranged from 50% to 80%, with a 20% fatality rate.⁵ Kocher, on the other hand, established a novel hemostasis technique in the first part of the twentieth century, consisting of suture ligation of vessels using the clamp and tie method. After a lot of work, the complication rate after thyroid surgery has dropped to 1%, and it's even lower in skilled hands.⁶ Numerous procedures for vascular ligation have been developed in recent years, resulting in shorter surgery times and fewer difficulties. LigaSure is an energy-based surgical equipment that delivers a fast vascular sealing system (VSS) capable of dissecting, ligating, and cutting vessels with a diameter of up to 7 mm.⁷

The purpose of this study is to compare the mean operative time and intra-operative bleeding between the two techniques undergoing total thyroidectomy.

MATERIALS AND METHODS

In this randomized controlled trial, 60 patients who planned for total thyroidectomy due to benign thyroid disorders were included. The study was conducted in general surgery unit from Jan-2020 to July-2021. Patients with recurrent goitre, having chronic renal failure or chronic liver disease were excluded. After taking informed consent, demographic data (age, gender, duration of goitre, place of living and BMI) were noted.

All selected cases were divided into group A & B by lottery method. In group A patients total thyroidectomy was done by using ligasure while in group B patients, near total thyroidectomy was done by clamp-and-tie technique. Operation was done by one consultant surgeon in both groups. Operation time and intra-operative blood loss were measured by the researcher herself.

All the data was entered and analyzed by using SPSS version 25.0. Operative time and intra-operative blood loss were compared by using Independent 't' test and P-value ≤ 0.05 was considered as significant.

RESULTS

Mean age of included patients was 45.60±12.1 years. Mean duration of disease was 7.8±4.5 months. Mean body mass index (BMI) was 24.80±3.61 kg/m². There were 43 (71.67%) females and 17 (28.33%) male patients. There were 13 (21.67%) patients were from rural area and 47 (78.33%) were from urban area (Table 1).

On comparison of operative time and intra-operative blood loss between the groups, mean operative time in group A was 61.33±5.98 hours and 75.06±6.61 hours in group B with significant p-value of <0.001. Mean intra-operative blood loss was 53.40±6.11 ml in group A and

81.47±9.29 ml in group B with significant p-value of <0.001 (Table 2).

Table 1: Baseline Study Variables.

Age	45.6±12.1
Disease Duration (months)	7.8±4.5
BMI (Kg/m ²)	24.80±3.61
Gender (Female / Male)	43 (71.67%) / 17 (28.33%)
Living Area (urban/Rural)	47 (78.33%)/13 (21.67%)

Table 2: Comparison of mean operative time and intra-operative blood loss between the groups.

Outcomes	Groups		P-value	
	Group A	Group B		
Operative Time	Mean	61.33	75.06	<0.001
	S.D.	5.98	6.61	
Intra-operative Blood Loss	Mean	53.40	81.47	<0.001
	S.D.	6.11	9.29	

DISCUSSION

Careful dissection and hemostasis are prioritized following a full thyroidectomy to reduce the risk of sequelae.⁸ The most common complications following full thyroidectomy include RLN, injury to parathyroid gland, esophagus, trachea, and thyroid vasculature hemorrhage.⁹

Molnar and colleagues discovered that employing the LigaSure small jaw gear to execute a full thyroidectomy is a safe and reliable method of removing the thyroid gland.⁹ Thyroid surgery without the use of sutures has become more common in recent years.¹⁰ Recent study has shown that LigaSure is effective in the treatment of thyroidectomies, both in terms of hemostasis and dissection. The usefulness of LigaSure in reducing surgical time, hospital stay, and intraoperative and postoperative complications is, on the other hand, up for debate.¹¹

In present study we compared the outcomes in-terms of blood loss and hospital stay in patients undergoing thyroidectomy using conventional clamp and tie technique with ligaSure in patients undergoing total thyroidectomy. In present study was female dominance, there were 71.7% female patients. Ahmed et al. also reported female predominance with 94.3% female patients.¹²

Both groups had the same demographics, comorbidities, diagnosis, and surgical approach. Our research shows that LigaSure significantly reduces surgical time and blood loss.

During colon and small intestine surgery, laparoscopy surgery (through Ligasure) has been used to seal the mesentery, including the inferior mesenteric arteries. Ligasure technology was used to close short gastric and epigastric veins during laparoscopic antireflux surgery.

We found significantly lower blood loss in LigaSure group, mean blood loss was 53.40±6.11 ml in LigaSure group versus 81.46±9.29 ml in conventional group.

Similarly, Hirunwiwatkul et al. found that the LigaSure treatment took 62.4±15.9 minutes to perform, whereas the conventional technique took 83.3±16.1 minutes, which was statistically significant. 109 With LigaSure Small Jaw, the time it took to do a thyroidectomy was reduced 80±12.4 minutes, compared to 106±23.5 minutes with standard surgery.¹³

A study by Mahmoud et al. compared the outcomes of LigaSure with conventional hemostatic technique and

reported a significantly lower operative time using LigaSure technique. The authors reported mean operative time of 115.00 ± 13.20 minutes in conventional group versus 88.83 ± 11.50 minutes in LigaSure group.¹⁴

In another study, the Ligasure method group had a mean operating time of 62.11±4.07 minutes, whereas the conventional technique group had a mean operating time of 73.05±4.01 minutes. The Ligasure technology group lost 57.28±3.42 ml of blood, whereas the conventional method group lost 70.85±4.12 ml.¹⁵

Reduced operating time is connected with less patient exposure to anesthesia and its medicines, saving the patient from anesthesia-related complications. Reduced blood loss during surgery may help us avoid blood transfusions, which have their own set of risks, and reduced post-operative blood loss may help us avoid drain installation, which causes post-operative discomfort.

When it comes to thyroid surgery, LigaSure has shown to be superior to the standard clamp and tie method in our research. It has also been shown that LigaSure causes heat damage that is somewhere between one millimeter and three millimeters in size, according to research. However, RLN damage was shown to be similar regardless of the changes in heat dissipation.¹⁶ The risk of vascular and nerve damage during thyroid surgery is greatly decreased when LigaSure is employed. When compared to a traditional thyroidectomy, the LigaSure vascular sealing device has been found to reduce operating time and blood loss.¹⁷

CONCLUSION

Thyroid surgery with Ligasure resulted in dramatically reduced mean operational time and postoperative blood loss compared to traditional approach.

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