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ORIGINAL ARTICLE

Comparison Between Conventional and Sutureless Thyroidectomy

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ABSTRACT

Objective: The main purpose of this study is to compare the outcomes between conventional and sutureless (Harmonic® FOCUS) thyroidectomy.

Study Design: Prospective/ Comparison study

Place and Duration: de'Montmorency College of Dentistry, Lahore.Nov 2019-Aug 2020

Methods: There were eighty patients of ages 20-70 years were presented in this study. All the patients had multinodular, primary and secondary goitre. Patients provided written consent for the detailed demographics included age, sex and body mass index. The patients were separated into two groups, I and II, for the study. Group I received conventional technique and sutureless technique was used in group II. Outcomes were operative time, hospital stay, blood loss, post-operative drainage volume and complications assessed and compared among both groups. We used SPSS 20.0 version to analyze complete data.

Results: In group I 35.34±6.55 years was the mean age with mean BMI 25.15±7.21 kg/m^2 and in group II mean age was 36.23±4.31 years with mean BMI 25.15±8.15 kg/m^2. There were 25 (62.5%) females and 15 (37.5%) males in group I and in group II 23 (57.5%) females and 17 (42.5%) males. Majority of the patients among both groups had multinodular goitre 32 (80%) and 30 (75%). We found less operative time in group II 60.12±11.52 minutes as compared to group II 81.9±9.34 minutes. Intraoperative blood loss in group I was significant 59.21±7.71 ml as compared to group II 26.4±10.39 ml. Mean drainage volume in group II was lower 10.13±13.23 ml as compared to group I 28.14±5.41 ml. Frequency of complications in group I was higher 5 (12.5%) as compared to group II 3 (7.5%).

Conclusion: As a result of this study, we determined that the sutureless thyroidectomy approach was a successful and safe alternative to conventional thyroidectomy in terms of reduced operative time, hospital stay, and post-surgical problems when compared to conventional thyroidectomy.

Keywords: Sutureless, Conventional, Thyroidectomy, Multinodular Goitre, Complications

INTRODUCTION

It was Abdul Kasan Kelebis Abis in Baghdad, who performed the first known surgical removal of a goitre in AD 500, despite the fact that the condition has been widespread for a long time. Despite the patient's severe postoperative haemorrhage, he survived. There were major issues with bleeding and infection in the nineteenth century, even though surgeon Theodor Billroth recorded a 36% intraoperative death rate for thyroid surgery. Thirdly, surgical hemostatic instruments and inhalation anaesthesia led to the development of thyroid surgery in late 19th century. [2].

Approximately the course of his career, Kocher conducted over 5000 thyroidectomies by the turn of the 20th century. As a skilled surgeon, he paid close attention to the process of hemostasis throughout procedures. A significant reduction in the risk of haemorrhage was achieved with the first-time use of closure of the inferior thyroid arteries by him. He had a high death rate because he used antiseptics and hemostasis. Mortality decreased from 12.6% in the 1870s to 0.2 % in 1898 [1]. [1]

Thyroid surgery, including whole thyroid removal, is currently the treatment of choice for all patients with bilateral benign multinodular goitre, Graves' disease, and most types of thyroid cancer[5, 6]. Bilateral benign thyroid disease is increasingly being treated with complete thyroidectomy procedures, which have the same safety profile as subtotal or near-total thyroidectomy procedures but are associated with much greater recurrence rates8.

Surgeons are now adopting cutting-edge technologies like LigaSure Small Jaw and Harmonic scalpel to perform thyroidectomies in a safer and more efficient manner. It has been proven time and time again that the LigaSure Small Jaw device reduces operative time, as well as intra- and post-surgical blood loss. Surgery is becoming more time-saving due to the high patient turnover and the shorter anaesthetic times required. [6]

It's now possible to perform vessel ligation and division without increasing the risk of complications after surgery thanks to new energy devices like the Harmonic Scalpel from Ethicon and the LigSure from Valleylab. Both of these devices use ultrasonic coagulation and bipolar energy to stop bleeding. 4 Harmonic® FOCUS and conventional suture ligation techniques were used in a comparative study of open total thyroidectomy to evaluate their outcomes. [7,8]

The primary goal of this study is to compare the outcomes of conventional thyroidectomy with those of sutureless thyroidectomy (Harmonic® FOCUS).

MTERIAL AND METHODS

This Prospective/ Comparison study was conducted at de'Montmorency College of Dentistry, Lahore and comprised of 80 patients were underwent for thyroidectomy. Patients provided written consent for the detailed demographics included age, sex and body mass index. Those who had malignant goitre, previous neck irradiation, recurrent goitre, ablation with radioiodine, hemithyroidectomy, or subtotal thyroidectomy were excluded from this study, as were those who had hemithyroidectomy or subtotal thyroid surgery.

Between the ages of 20 and 70, the patients participated in the study. A total of two groups of patients were studied: I and II. Group I was treated using the usual procedure, while group II was treated with the sutureless method. In all cases, general anaesthesia was used in conjunction with endotracheal intubation. As a result of the platysma muscle division, the neck's strap muscle was divided. In the case of a large goitre, cutting of the strap muscles is necessary. A Vicryl 2/0 suture was used to close the blood vessels of each thyroid lobe [in the conventional thyroidectomy group] or Harmonic® FOCUS (Harmonic - Ethicon Endo Surgery INC- Johnson and Johnson Medical SPA, Somerville, NJ) was used to coagulate and divide the blood vessels of each thyroid lobe [in the sutureless thyroidectomy group] to close the blood vessels of each thyroid lobe. After the recurrent laryngeal nerves and parathyroid glands were discovered and separated from the thyroid capsule, the thyroid lobe was gradually dissected from the trachea in a stepwise fashion. The placement of a suction drain in the thyroid bed during the first 48 hours was usual in order to quantify the amount of blood loss. Vicryl 3/0 suture was used to close the strap muscle and platysma muscle, and subcuticular suture was used to close the skin.

Outcomes were operative time, hospital stay, blood loss, post-operative drainage volume and complications assessed and

compared among both groups. We used SPSS 20.0 version to analyze complete data. Mean standard deviation, frequency and percentage were used for categorical variables.

RESULTS

In group I 35.34±6.55 years was the mean age with mean BMI 25.15±7.21 kg/m^2 and in group II mean age was 36.23±4.31 years with mean BMI 25.15±8.15 kg/m^2. There were 25 (62.5%) females and 15 (37.5%) males in group I and in group II 23 (57.5%) females and 17 (42.5%) males. Majority of the patients among both groups had multinodular goiter 32 (80%) and 30 (75%).(table 1)

Table 1: Baseline characteristics of enrolled cases

Variables	Conventional Group	Sutureless Group
Mean Age (years)	35.34±6.55	36.23±4.31
Mean BMI (kg/m^2)	25.15±7.21	25.15±8.15
Gender		
Men	15 (37.5%)	17 (42.5%)
Women	25 (62.5%)	23 (57.5%)
Goiter		
Multinodular	32 (80%)	30 (75%)
Primary toxic	5 (12.5%)	6 (15%)
Secondary toxic	3 (7.5%)	4 (10%)

We found less operative time in group II 60.12±11.52 minutes as compared to group II 81.9±9.34 minutes. Intraoperative blood loss in group I was significant 59.21±7.71 ml as compared to group II 26.4±10.39 ml. Mean drainage volume in group II was lower 10.13±13.23 ml as compared to group I 28.14±5.41 ml. Mean pain score was comparatively less in group I.(table 2)

Table 2: Comparison of outcomes among both groups

Variables	Conventional group	Sutureless group
Mean Operative time (min)	81.9±9.34	60.12±11.52
Mean Blood Loss (ml)	59.21±7.71	26.4±10.39
Mea Drainage of Volume (ml)	28.14±5.41	10.13±13.23
Mean Pain score (VAS)	7.6±3.12	4.9±5.34

Frequency of complications in group I was higher 5 (12.5%) as compared to group II 3 (7.5%).(table 3)

Table 3: Post-operatively comparison of complications among both groups

Variables	Conventional group	Sutureless group
Complications		
Hematoma	1 (2.5%)	1 (2.5%)
Seroma	2 (5%)	0
Surgical site infection	2 (5%)	1 (2.5%)
Total	5 (10%)	3 (7.5%)

DISCUSSION

The development of current surgical techniques, as well as the integration of these procedures with a more complete understanding of anatomy and endocrinology, are documented in the history of thyroid surgery. To treat benign multinodular goitre, total thyroidectomy is the preferred treatment option, and it is considered standard treatment for malignant goitre as well. Precision dissection and hemostasis are required to provide a clear surgical field, limit the likelihood of structural damage, prevent postsurgical haemorrhage, and avoid the need for surgical drains; nevertheless, the safest and most efficient method of accomplishing these goals is still up for debate. [9]

In this Prospective/ Comparison study eighty patients of both genders with ages 20-70 years were included. The patients were separated into two groups, I and II, for the study. Group I received conventional technique and sutureless technique was used in group II. In group I 35.34±6.55 years was the mean age with mean BMI 25.15±7.21 kg/m^2 and in group II mean age was 36.23±4.31 years with mean BMI 25.15±8.15 kg/m^2. There were 25 (62.5%) females and 15 (37.5%) males in group I and in group II 23 (57.5%) females and 17 (42.5%) males. According to the findings of the current research, they were equivalent to those obtained from previous studies.[10,11] Majority of the patients among both groups had multinodular goiter 32 (80%) and 30 (75%). Benign multinodular goitre, according to a prior study, is the most common endocrine illness, especially in places where iodine deficiency is prevalent. Pressure symptoms such as dysphagia or shortness of breath, suspected cancer, extensive retrosternal extension, drug-resistant hyperthyroidism, and cosmetic issues are all reasons to consider surgical treatment for these conditions.[12]

We found less operative time in group II 60.12±11.52 minutes as compared to group II 81.9±9.34 minutes. Intraoperative blood loss in group I was significant 59.21±7.71 ml as compared to group II 26.4±10.39 ml. Mean drainage volume in group II was lower 10.13±13.23 ml as compared to group I 28.14±5.41 ml. Mean pain score was comparatively less in group I.[10,11] There have been numerous studies that have shown that sutureless thyroidectomy can greatly reduce the postoperative drainage volume. Our findings confirmed that sutureless complete thyroidectomy can significantly reduce the postoperative drainage volume.[13] Melck's meta-analysis found a similar outcome, while Garas found that the incidence of hypocalcemia was lower in the Sutureless total thyroidectomy group than in the conventional total thyroidectomy. [14,15] The most common causes of thyroidectomy-related bleeding are ruptured thyroid arteries and thyroid parenchymal haemorrhage, both of which are preventable. In addition to causing problems such as seromas and/or hematomas, haemorrhage (either intraoperatively or postoperatively) can also be the cause of potentially fatal hypoxia. Operative time, length of hospital stay, and expenditures are all increased when hemostasis is not maintained properly.[16] The most time-consuming element is the division or ligation of the thyroid arteries. The use of innovative techniques for vessel ligation and division, together with minimal increase in the risk of postoperative complications, can significantly shorten surgical times. LigaSure Small Jaw reduced the operational time for thyroidectomy from 106 23.5 minutes to 80 12.4 minutes (p=0.006), compared to conventional thyroidectomy, which took 106 23.5 minutes. [17]. An independent meta-analysis by Zhang et al. found a considerable time savings for Ligasure patients compared to the traditional suture ligation procedure. [18]

Frequency of complications in group I was higher 5 (12.5%) as compared to group II 3 (7.5%). In a research by Kalemera-Ssenyondo et al, hematoma formation, seroma formation, and wound infection were all found to be zero percent in the drain versus no drain groups. The researchers found that three patients (3.75 percent) developed wound infection in the Al-Dhahiry et al. study: two patients in the conventional suture ligation group and a single patient in the suture-free group The fact that the P-value was 0.331 had no statistical significance in this case. They were regarded with a degree of conservatism. [19] Since it was less invasive and had a lower overall complication rate, this study's findings suggest that Sutureless thyroidectomy should be the method of choice for treating thyroid disorders.

CONCLUSION

As a result of this study, we determined that the sutureless thyroidectomy approach was a successful and safe alternative to conventional thyroidectomy in terms of reduced operative time, hospital stay, and post-surgical problems when compared to conventional thyroidectomy.

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