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ORIGINAL ARTICLE

Comparison of Functional Outcomes of Endoscopic Lobectomy versus Open Lobectomy in Benign Thyroid Disease; A Randomized Controlled Trail

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ABSTRACT

Background: Thyroid nodules are nodules which commonly arise within an otherwise normal thyroid gland. A comprehensive history & physicals examination provides the foundations for decisions making in the managements of thyroids nodule. Endoscopic thyroidectomy is a newer technique and it is not accepted as a routine operation for thyroid diseases. With rising female gender, age, anemia & history of thyroid therapy, the possibility of thyroid nodules is greater.

Objective: To compare the outcome of endoscopic lobectomy versus open lobectomy for benign diseases of thyroid gland

Methodology: Randomized control trial was conducted in which after meeting the inclusion criteria 60 patients were participated in this study. Then patients were divided into two groups. One group is treated with endoscopic lobectomy technique and other with open lobectomy technique. During surgery, operative time was noted and then hospital stay was noted.

Results: The' patients average age was 28.68± 10.38 year, patients with endoscopic lobectomy procedures the mean surgery duration of patients was 101.60±24.16 minutes whereas among patients with open lobectomy surgical procedures the patients mean of surgery duration was 120.43±38.18 minutes (p-value=<0.05), similar finding observed in terms of hospital stay.

Practical Implications: This will help in the early and prompt management of the thyroid swellings without causing any cosmetic effect and thus time saving and more efficient procedure would be endoscopic reresection of thyroid gland.

Conclusion: The endoscopic lobectomy showed significantly better outcome than to open lobectomy for management of benign diseases of thyroid gland

Keywords: Thyroid Gland, Benign, Endoscopy, Lobectomy, Pakistan

INTRODUCTION

The frequency of thyroids tumors has experiences a significant rises in past 20s years [1], while the prevalence of thyroid tumors (benign as well as malignant) is reported to be 1.2%[2]. As the thyroid tumors leads to thyroidectomy, cosmetic concerns are major issue in this procedure, attributing to the fact that thyroids disorders are common in female as compared to males.

Conventionals thyroidectomy through a skin creases incisions in the anterior necks has been the provens, efficacious surgical methods for treating various thyroids tumors for the past decades. Conventional thyroidectomy require a cervical collars incisions, leaving an unsightly scars.[1]

Since the advent of minimally invasive surgery for thyroid surgery, several approaches have been investigated to improve accessibility and for patients cosmetic satisfaction.[3] Among the several techniques of endoscopic thyroidectomy, the trans-axillary video or roboticassisted technique seems to be the most promising approach as it leaves no visible neck scar[4].

Endoscopic thyroidectomy was first described by Hüscher in 1997. The most commonly used non-cervical approach are the axillary [(2)], the breasts [(3)], the laterals [(4)] and also certains hybrids approaches [(5)], like the axillary bilaterals breast approaches, the bilateral axillo-breasts approaches, the unilateral axillo-breasts approaches[5].

Endoscopic thyroidectomy not only is cosmetically feasible but also may offer more rapid recovery of emotional & physical functions than open thyroidectomy [6]. Some studies suggested that axillo breast approach is more painful in long term but due to less cosmetic damage, patients recover more quickly emotionally [7].

Similarly another study suggested that it is better in terms of less complications such as deceased blood loss, heamo-stable [2], safe and feasible, however same study also stated that as this is a comparatively lengthy procedure, it increases hospital stay duration which would add to the financial burden of the patient. [8]

One study reported that the mean operative time was 125.3±33.8min with endoscopic procedure and 79.8±33.8min with open lobectomy (p<0.05) and average hospital stay was 3.1±0.9days with endoscopic procedure and 2.2±0.7days with open lobectomy (p<0.05) for benign thyroid gland disease.[8] While other study also stated that mean operational time was 142min 'with' endoscopic procedure and 121min with open lobectomy (p>0.05), also mean days required to return to normal activity (including hospital stay) was 6days with endoscopic procedure and 6days with open lobectomy (p>0.05) for benign thyroid gland disease.[9]

This study rationale, is to compares 'the ''outcome' "of endoscopic lobectomy versus open lobectomy for benign diseases of thyroid gland. Endoscopic thyroidectomy is a newer technique and it is not accepted as a routine operation for thyroid diseases. Literature showed that endoscopic method needs more time but have less hospital stay as it is less invasive than open lobectomy. Thus we want to conduct 'this' study 'to get' local evidence for local setting and implement more beneficial and less invasive method to improve outcome of lobectomy.

To compare the outcome of endoscopic lobectomy versus open lobectomy for benign diseases of thyroid gland

METHODOLOGY

A Randomized 'Controlled Trial was conducted at Central Park Teaching Hospital in collaboration with the Lahore General Hospital from October 2022 to March 2023 after getting ethical letter from Central Park Medical College and Teaching Hospital Lahore. A total sample size of 60 was calculated; 30 'cases' in 'each' group 'is' calculated with (95% confidence level), 80% power of study & taking magnitude 'of' average hospital stay, i.e 3.1 ± 0.9 days with endoscopic procedure and 2.2±0.7 days with open lobectomy for benign thyroid gland disease[8]. Non - probability (consecutive sampling) technique was employed in which patients with'age range of 15 – 50 years or either gender presenting with benign disease of thyroid gland as per operational definition was recruited. While those patients who had gland size > 5cm or Multi nodular goiter (on ultrasound), recurrent cases or previous neck

surgery (on medical record) and malignant thyroid disease on FNAC and histopathology were excluded for sake of endoscopic procedure.

Data Collection Procedure: 60 patients ful-filling the selection criteria was included in study through wards of Surgery Department, Lahore General Hospital & Central Park Teaching Hospital Lahore. Informed consent' was 'taken'. Demographic like name, gender, age, duration 'of' 'symptoms, was noted. Then patents were 'randomly' 'divided' in 'two' 'groups' by 'using' random number table. In group A, patients underwent lobectomy by endoscopic method. In group B, patient underwent lobectomy by open procedure. All patients underwent surgery under general anesthesia and aseptic measures by a single surgical team with assistance of researcher. During surgery, operative time was noted (as per operational definition). Patients were moved to post operative wards after surgery & will be accompanied there until discharge & total stay in hospital has been noted (as per 'operational 'definition).

Data Analysis: Data was analyzed 'using''SPSS''26.0. Mean ± SD was calculated numerical variables like age, duration 'of' symptoms, surgery duration and total stay in hospital. Frequency & percentage was given for variables (qualitative) like gender was presented for qualitative variables. Independent samples t-test was applied to compare mean operative time and hospital stay. P value is less than 0.05 was considered statistically 'significant'. Data was 'stratified' for 'gender, age, size of nodule, length of symptoms to control consequence modifiers. Post - stratification, independent samples t-test was 'applied' to compare mean operative time and hospital stay for each strata. Pvalue less than 0.05 was considered statistically 'significant'.

RESULTS

In 'this ''total' 60 patients were 'enrolled'. The patients average age was 28.68±10.38 years with minimum and maximum ages of 18 & 66 years respectively.

Among patients with endoscopic lobectomy procedure the average age of the patients was 26.87±4.37 years whereas among patients with open lobectomy surgical procedure the average age of the patients was 30.50±13.88 years. In our study 2(3.33%) patients were male and 58(96.67%) patients were females. Among patents with endoscopic lobectomy no patients was male whereas among patients with open lobectomy procedure 2(6.7%) patients were male. Similarly among endoscopic lobectomy procedure 30(100%) patients were females while among open lobectomy procedure 28(93.3%) patients were females. The average duration of symptoms of the patients was 2.50±1.83 months with minimum and maximum symptoms duration of 1 & 7 months respectively.

The study results showed that among patients with endoscopic lobectomy procedure the average duration of symptoms of the patients was 2.53±2.06 months whereas among patients with open lobectomy surgical procedure the average duration of symptoms of the patients was 2.47±1.58 months. In our study the average size of nodule of the patients was 12.63±8.52 mm with minimum and maximum nodule size of 4 & 35 mm respectively. According to this study among patients with endoscopic lobectomy procedure the nodule size of the patients was 8.67±6.44 mm whereas among patients with open lobectomy surgical procedure the average nodule size of the patients was 16.60±8.59 mm. In our study the average surgery duration of the patients was 111.02±33.07 minutes with minimum and maximum surgery duration of 70 & 180 minutes respectively. Among patients with endoscopic lobectomy procedure the average surgery duration of the patients was 101.60±24.16 minutes whereas among patients with open lobectomy surgical procedure the average surgery duration of the patients was 120.43±38.18 minutes. This difference was statistically significant i.e. p-value<0.05. as explained in table 1 on appliance of independent sample t test.

Table 1: Comparison of duration of duration of surgery (minutes) among surgical procedures

		Surgical procedure		p-value
		Endoscopic Lobectomy	Open Lobectomy	
Duration of surgery (minutes)	n	30	30	0.027
	Mean	101.60	120.43	
	Std. Deviation	24.16	38.18	

The average total hospital stay of the patients was 63.20±31.39 hours minutes with minimum and maximum hospital stays of 24 & 120 hours respectively. The study results showed that among patients with endoscopic lobectomy procedure the average total hospital stay of the patients was 46.40±22.67 hours whereas among patients with open lobectomy surgical procedure the average total hospital stays of the patients was 80±30.12 hours. This difference was statistically significant i.e.. p value <0.05. as explained in table 2

Table 2. Comparison of total hospital stays among surgical procedures

		Surgical procedure		pvalue
		Endoscopic Lobectomy	Open Lobectomy	
Total Hospital Stay (hours)	n	30	30	<0.001
	Mean	46.40	80.00	
	Std. Deviation	22.67	30.12	

This 'study' showed significant differences 'in' patients with age <35 years among comparison of duration of surgery and total hospital stays i.e. p values is less than 0.05. '

Among female 'patients' there is a significant differences between the surgical procedure and surgery durations, total hospital stay 'of' 'the' 'patient' i.e. p value is less than 0.05 '

DISCUSSION

The first endoscopic procedures for the removals of small thyroids nodules have been introduced since 1998, but they haven't becomes popular because the advantage of this slightly invasive operation seemed to be limited, mostly if compared to a well standardized operations like thyroidectomy that had reached an excellents standard during recent years.[10, 11]

In our study among patients with endoscopic lobectomy procedures the averages surgery patients duration was 101.60±24.16 minutes whereas among patients with open lobectomy surgical procedures the averages surgery patients duration was 120.43±38.18 minutes (p – values < 0.05). In this study among patients with endoscopic lobectomy procedure the average total hospital stay of the patients was 46.40±22.67 hours whereas among patients with open lobectomy surgical procedure the average total hospital stays of the patients was 80±30.12 hours (p-value<0.05).

One study reported that the mean operative time was 125.3±33.8min with endoscopic procedure and 79.8±33.8min with open lobectomy (p<0.05) and mean hospital stay was 3.1±0.9days with endoscopic procedure and 2.2±0.7days with open lobectomy (p<0.05) for benign thyroid gland disease.[12]

One study by Nina Irawati et al[13] concluded in their study that two cases of endoscopic right lobectomy as a safe, reproducible technique with an indication in a minority of patients candidates for thyroidectomy and is characterized by less postoperative discomfort.

Another study by Feilin Cao et al revealed in their study findings that endoscopic thyroidectomy performed via breasts approaches is a technically feasibles & safe procedures with excellent cosmetics outcomes for benign thyroids tumors patients. In additions to improved cosmesis, many patients experiences decreased pains and fasters recovery, & are at no increased complication risk.[14]

Shailesh P Puntambekar et al[15] documented that it's possible to removes large nodules & performs as well as whole

thyroidectomies using our endoscopics approaches. It is a safe & effective techniques in the hands of a properly qualified surgeon.

Generally, endoscopic thyroid surgery has been thought to be appropriate for benign thyroid disease. It has been contraindicated in thyroid cancer patients because clinicians thought that a complete thyroidectomy could not be adequately performed via endoscopic means.[52]

Yamamoto et al[16] done a study vs traditional free thyroid lobectomy analysis to benign growth thyroid nodules. The author presented that compared with conventional surgery, endoscopic thyroidectomy for benign thyroid nodules was associated with less blood loss, although blood loss was minimal for both procedures. There were no practical differences in technical ability to perform. No postoperative complications (hemorrhage or recurrent laryngeal nerve paralysis) were present in either group.

Medical resources, diagnosis, and treatment must improve in developing countries. There are limited resources: access to medical and health resources; knowledge about disease; awareness, trainings, and awareness about health.[18,19,20,21] The heath literacy is mandatory for any disease and facilitates the patients with resources, databases, and trainings about disease.[22, 23,24]

Yi Yang et al[17] presented that Endoscopic thyroidectomy is a relatively new approach in treating differentiated thyroid cancer. Compared to conventional thyroidectomy, scarless endoscopic thyroidectomy has a superior cosmetic result. And it also reduces the incidence of hypesthesia, paresthesia, or feelings of self-consciousness. However, the outcome depends, to a large extent, on the skill of the operator and the learning curve being relatively long. With the development of surgical equipments and skills, operation time and complications will be reduced. Indications of endoscopic thyroidectomy will be widened and it will be more and more performed.

CONCLUSION

According to this study the endoscopic lobectomy showed significantly better outcome in terms of duration of surgery and recovery as compared to open lobectomy for management of benign diseases of thyroid gland.

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