

Outcome of Thyroid Surgery by Lateral Approach: Our Cases Experience in Rajshahi Medical College Hospital, Rajshahi, Bangladesh

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ABSTRACT

Introduction: Thyroidectomy is the commonest endocrine surgical procedure undertaken throughout the world. Although it is one of the most frequently performed surgical procedure worldwide, it was during the last century that, it become an accepted operation. **Objective:** The aim of this study was to observe the outcome of thyroid surgery by lateral approach. **Materials and Methods:** A Prospective Study Department of ENT, Rajshahi Medical College Hospital, Rajshahi, Bangladesh during from July 2017 to December 2019. A total number of 218 cases of thyroid surgeries were performed using this procedure. Simple random sampling technique. Detailed history was taken and every patient was examined thoroughly specially focusing on the neck. All patients were done USG of the neck, Fine needle aspiration cytology (FNAC) and thyroid function test. All procedures were done by a single surgeon. **Results:** In our study among 218 cases 177 cases were female and rest are male. 81.19% of our study subjects were female and male to female ratio 1:4.3(TGBE1), age ranges from 10-70 years, mean age 38.5±8.10, most of the patients belongs to 31-40 years of age. Rest of 139 were benign thyroid diseases. This group most common age group 31-40 years. 138 cases were benign thyroid lesion which were nodular goiter (63.30%) follicular adenoma (0.031%), Toxic MNG (0.0181%), 79 cases of carcinoma thyroid among which 74 were papillary carcinoma (33.94%), 02 were follicular carcinoma (0.009%) and 03 were medullary carcinoma (0.0131%). 79 were malignant, 28 patients had lymph node metastasis. Patients with benign thyroid lesion underwent 34 hemithyroidectomy for nodular goiter (15.59%), 8 hemithyroidectomy for follicular adenoma (0.036%) multinodular goiter involving both lobe of thyroid done total thyroidectomy was 92 (42.20%). PTC underwent total thyroidectomy with central neck dissection 40 (18.34%), total thyroidectomy with CND + SND (level II to IV) 23 cases (10.55%), total thyroidectomy with CND +Bilateral MRND 02 cases (0.009%), and completion thyroidectomy 8 cases (0.036%), 4 cases of follicular carcinoma done total thyroidectomy with CND (0.0183%) and 4 cases of toxic MNG done total thyroidectomy (0.0183%). In our study most common complication was temporary para-thyroid insufficiency 47 cases (4.14%), and permanent parathyroid insufficiency 2 cases (0.011%), up to one year follow up. **Conclusion:** Lateral approach to thyroid is a safe alternative to the standard approach for re-exploratory thyroid surgery. Lateral approach to thyroid is an alternative to both conventional thyroidectomy and for parathyroid explorations.

Keywords: Lateral approach, Re-operative, Thyroid

INTRODUCTION

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The traditionally taught technique for conventional thyroidectomy is via midline splitting of strap muscles (Midline Approach-MA). Lateral approach (LA) uses the same central neck incision but approaches thyroid gland posterolaterally between the anterior border of sternocleidomastoid (SCM) and strap muscles. Thyroidectomy is the commonest endocrine surgical procedure undertaken throughout the world. Although it is one of the most frequently performed surgical procedure worldwide, it was during the last century that, it become an accepted operation. Many thyroid surgeons contributed over the last 100 years to make thyroidectomy a very safe operation with a complication rate around 1-2 % [1-3]. Complication of thyroid surgery are directly related to the extent of the resection and inversely proportional to the experience of the operating surgeons [4-7] The cornerstones of safe and effective thyroid surgery are an adequate training undertaking of the anatomy and pathology, as well as meticulous bloodless dissection. The traditional technique for thyroidectomy is via midline splitting of the strap muscles (Midline approach) [8]. Lateral approach uses the same central neck incision the same central neck incision that approach thyroid gland posterolaterally between the anterior border of sternocleidomastoid muscle (SCM) and strap muscles [9-11]. Critical structure that require identification and preservation in thyroid surgery such as parathyroid gland and recurrent laryngeal nerve are posterolaterally located in relation to thyroid lobe. Lateral approach allows as easier access in to surgical field for identification on these critical and vital structure with minimum retraction and pulling of strap muscle [9]. This technique usually reserved for recurrent or redo thyroid surgery to avoid extensive scarring and adhesion after previous surgery. It is also used for para thyroid surgery [10]. Trans Axillary endoscopic and robotic thyroidectomy approaches also use the same lateral approach to reach and dissect thyroid gland [11,12]. Few publications state the efficacy of the lateral approach and most authors conclude that a lateral approach offers excellent visualization of vital structure [13-16]. Lateral approach to thyroid is a good alternative to standard midline exploration [17,18] and this approach is practiced in Rajshahi Medical College Hospital, Rajshahi, Bangladesh for recurrent thyroidectomy, hemithyroidectomy, total thyroidectomy with neck dissection and para-thyroidectomy operations. Study was performed on a total 218 cases at Rajshahi Medical College Hospital, Rajshahi, Bangladesh via lateral approach including both primary thyroid surgeries, revision thyroid surgeries along with neck dissection to see the safety effectiveness and probable outcome.

MATERIALS AND METHODS

- **Study design:** A Prospective Study
- **Study period:** July 2017 to December 2019
- **Study place:** Department of ENT, Rajshahi Medical College Hospital, Rajshahi, Bangladesh
- **Sampling technique:** Simple random sampling
- **Sample size:** A total number of 218 cases of thyroid surgeries were performed using this procedure

Inclusion criteria

1. Benign primary lesion requiring surgery
2. Revision thyroid surgery
3. Thyroid malignancy with or without neck dissection

Exclusion criteria

1. Thyroid lesions requiring surgery secondary to other neck pathology
2. Advance thyroid malignancy involving carotid, prevertebral fascia with mediastinum
3. Anaplastic carcinoma of thyroid
4. Patients unfit for surgeries
5. Patients no giving consent

Detailed history was taken and every patient was examined thoroughly specially focusing on the neck. All patients were done USG of the neck, Fine needle aspiration cytology (FNAC) and thyroid function test. CT-SCAN and sometimes MRI carried out in some selected cases especially huge multinodular goiter with retro sternal extension and malignant thyroid with neck metastasis. Fiber optic laryngoscopy (FOL) was done to see the vocal cord movement with the history of previous thyroid surgery and some malignant patients with voice change. All patients and relative were counseled regarding the nature of the diseases, treatment options, expenses of surgery and post-operative radio iodine ablation therapy where indicated. The patients were observed and post-operative complications during their stay in hospital and after discharge from hospital. All the patients were examined at a regular interval monthly for three months every six months for life long with maintaining follow up records, during each follow up visit a thorough clinical examination was done in all patients and appropriate investigations were carried out where indicated. A complete record of complication, their diagnosis and treatment was maintained during that period and the study was approved by the hospital ethical committee. Hemithyroidectomy, Total thyroidectomy, Total Thyroidectomy with CND, Total Thyroidectomy with different types of neck dissection to modified radical neck dissection were done in our study.

Surgical technique

In lateral approach thyroidectomy the same 4-6 cm skin crease incision was made in front of neck in between thyroid cartilage and supra-sternal notch. Instead of midline separation and retraction of strap muscles, the anterior border of SCM was identified and mobilized laterally, the superior belly of Omohyoid Muscle that crosses field was retracted cranially. The lateral edge of strap muscles was identified and retracted medially to expose the underlying goiter. The ansa cervicalis coursing downwards anterior to the Sternohyoid Muscle was identified and retracted medially along with the strap muscles. Fibro-fatty tissue overlying the upper part of thyroid was removed and superior vascular pedicle was exposed and superior thyroid vein and artery were ligated separately to preserve the EBSLN. After ligating the superior thyroid vessels, the para tracheal region was exposed by retracting the SCM Muscle and Carotid artery laterally and the thyroid anteromedially where the RLN was anatomically located. While looking for RLN, ZT, ITA and the lower border of the inferior horn of thyroid cartilage were used as a guide. The RLN was usually found by dissection around the inferior thyroid artery at the level of the middle pole thyroid. Inferior thyroid artery was ligated near the gland and the branch to superior para thyroid gland was preserved. Whole length of the RLN was dissected up to its entry to larynx. Both para-thyroid preserved by identifying them. Inferior thyroid vein was ligated and divided and the thyroid lobe is freed up from its attachment to the ligament of Berry and underlying tracheal rings. For hemithyroidectomy the isthmus was then transected to complete the operation. Patients undergoing total thyroidectomy, similar dissection on the opposite lobe were fully dissected and freed from the overlying strap muscle. The entire specimen was removed En-bloc for histopathology. Drain was given and SCM muscle and strap muscle were sutured with keeping some gaps to prevent life threatening hematoma.

RESULTS

In our study among 218 cases 177 cases were female and rest are male. 81.19 % of our study subjects were female and male to female ratio 1:4.3(TGBE1), age ranges from 10-70 years, mean age 38.5±8.10, most of the patients belongs to 31-40 years of age. Most common age group was 31-40 years' group. Rest of 139 were benign thyroid diseases. This group most common age group 31-40 years. 138 cases were benign thyroid lesion which were nodular goiter (63.30 %) follicular adenoma (0.031 %), Toxic MNG (0.0181 %), 79 cases of carcinoma thyroid among which 74 were papillary ca thyroid (33.94 %), 02 were follicular carcinoma (0.009 %) and 03 were medullary carcinoma (0.0131 %). 79 were malignant, 28 patients had lymph node metastasis. Patients with benign thyroid lesion underwent 34 hemithyroidectomy for nodular goiter (15.59%), 8 hemithyroidectomy for follicular adenoma (0.036%) multinodular goiter involving both lobe of thyroid done total thyroidectomy was 92 (42.20 %). PTC underwent total thyroidectomy with central neck dissection 40 (18.34 %), total thyroidectomy with CND + SND (level II to IV) 23 cases (10.55%), total thyroidectomy with CND +Bilateral MRND 02 cases (0.009%), and completion thyroidectomy 8 cases (0.036 %), 4 cases of follicular carcinoma done total thyroidectomy with CND (0.0183 %) and 4 cases of toxic MNG done total thyroidectomy (0.0183 %) (Table 1-6) (Figure 1-2).

Table 1: Age distribution thyroid patients (N=218)

Age	Number	Percentage
10-20	8	3.67 %
21-30	56	25.69%
31-40	58	26.61%
41-50	34	15.60%
51-60	44	20.18 %
61-70	18	8.26 %

Table 2: Age distribution of CA- thyroid (N=79)

Age	Number	Percentage
<10-20	3	3.79 %
21-30	29	36.71 %
31-40	19	24.05 %
41-50	12	15.19 %
51-60	14	15.19%
61-70>	2	2.53%

Table 3: Age distribution of benign thyroid diseases (n=139)

Age (years)	Number	Percentage
4	8	2.89 %
21-30	42	30.22 %
31-40	44	31.65 %
41-50	20	14.39 %
51-60	28	20.14 %
61-70	1	0.72 %

Table 4: Neck node metastasis in carcinoma thyroid (n=79)

Neck node metastasis	Number of Patients	Percentage
Metastasis	28	35.44 %
No metastasis	51	64.55 %

Table 5: Types of thyroid lesion (n=218)

Types	Number	Percentage
Benign	138	63.30 %
Nodular Goiter	126	57.59 %
Follicular Adenoma	8	0.03 %
Toxic MNG	4	0.018 %
Malignant	79	36.24 %
Papillary CA thyroid	74	33.94 %
Follicular Carcinoma	02	0.009 %
Medullary Carcinoma	03	0.013 %

Table 6: Histological variation of thyroid Lesion and operative procedure (N=218)

Types of thyroid lesion	procedure	Number
Nodular goiter	Hemithyroidectomy	34 (15.59 %)
Follicular adenoma	Hemithyroidectomy	08 (0.036 %)
Multinodular goiter	Total thyroidectomy	92 (42.20 %)
Papillary CA thyroid	Total thyroidectomy with central neck dissection(CND)	40 (18.34 %)
Papillary CA thyroid with neck metastasis	Total thyroidectomy with CND +SND(Level II to IV)	23 (10.55 %)
Papillary CA thyroid with neck node metastasis	Total thyroidectomy with CND+ MRND	02 (0.009 %)
papillary Ca thyroid	Completion (3.67%) Thyroidectomy	08 (0.036 %)
Medullary Carcinoma with neck node metastasis	Total thyroidectomy +CND+ Bil MRND	03 (0.013 %)
Follicular CA thyroid	Total thyroidectomy with CND	04 (0.0183 %)
Toxic MNG	total thyroidectomy	04 (0.0183 %)

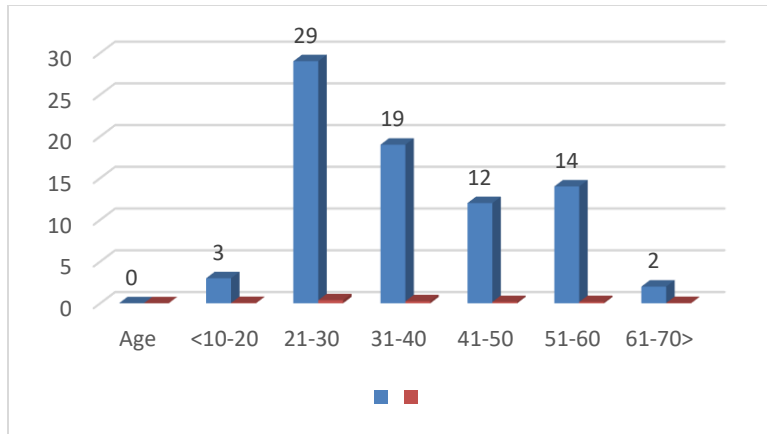


Figure 1: Age distribution of CA- thyroid (N=79)

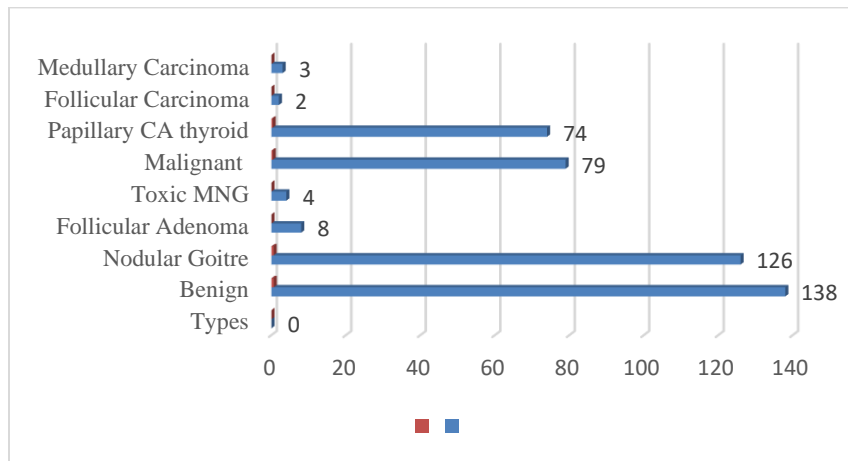


Figure 2: Types of thyroid lesion (n=218)

Patients with unilateral benign thyroid lesion underwent hemithyroidectomy, multinodular goiter involving both lobes and toxic nodular goiter underwent total thyroidectomy. Differentiated thyroid carcinoma (P+F) were treated with Total thyroidectomy with CND. Carcinoma Thyroid patients neck node metastasis received Total thyroidectomy with SND with MRND where appropriate [Table-7].

Table 7: Average operating time and blood loss

Se. No.	Thyroid lesion	Operative procedure	Average operating time	Avg. blood loss
1.	Nodular goiter	Hemithyroidectomy	30-50 min	15-20 ml
2.	Multinodular goiter	Total thyroidectomy	1 hour–1 hour 15 min	15-40 ml
3.	Toxic goiter	Total thyroidectomy	1 hour–1 hour 30 min	50-60 ml
4.	CA thyroid	Total Thyroidectomy	1 hour–1 hour 30 min	15-50 ml
5.	Ca thyroid + neck Metastasis	Total thyroidectomy + Neck dissection	1 hour 45 min–2 hour 30 min	30-70 ml

In our study most common complication was temporary para-thyroid insufficiency 47 cases (4.14%), and permanent parathyroid insufficiency 2 cases (0.011%), up to one year follow up [Table-8].

Table 8: Outcomes and complication of lateral approach thyroidectomy

Outcomes/ complications	Percentage	Follow up
Recurrent laryngeal Nerve identification possible	382 (98.96 %)	
Recurrent laryngeal Nerve identification not possible	04 (1.04 %)	
Temporary paresis of RLN	16 (4.14 %)	13 cases recovered within 6 month
Permanent RLN palsy	03 (0.777 %)	3 cases did not recover up to 1 year follow up 2 cases have permanent voice change
Pre-operative unilateral RLN palsy	2 (0.51 %)	Nerve was found engulfed by the tumor
Temporary Para thyroid insufficiency	47 (27.97 %) out of 168 cases of total thyroidectomy`	45 patients recovered in the succeeding 6 month follow up.
Permanent Para thyroid insufficiency	2 (0.011 %) out of 168 cases	2 patients have permanent hypothyroidism up to 1 year follow up
Post-operative hematoma tension	01 (0.45 %) out 218 cases	Required re-exploration & Tracheostomy
Post-operative Infection	NIL	
Stich Granuloma	02 (0.91 %) out of 218 cases	Excision
Hypertrophied Scar	03 (1.37 %) out of 218 cases	Required steroid injection

DISCUSSION

Thyroidectomy is a commonest surgical procedure in Head Neck surgeon's but very common Complication of this surgery are RLN injury, Parathyroid insufficiency and EBSLN injury and accompanying per operative bleeding. In lateral or backdoor approach thyroidectomy all of the above complication could be minimized as in this approach we can easily reach the upper pole and easily identify superior thyroid veins and by individual ligating of these veins and EBSLN could be preserved. Landmark of identifying of RLN, i.e. inferior thyroid artery, ZT, and lower border of inferior cornu of thyroid cartilage could be easy access LA and thereby easy to identify RLN. In LA no need to cut the strap muscle in any size of thyroid. Because strap muscle cutting lead to fibrosis with laryngotracheal fixation that impairs vertical mobility together with strap muscle. Temporary malfunction with the resulting deleterious effect on voice and swallowing function [19]. In our study among 218 cases 177 cases were female and rest are male. 81.19 % of our study subjects were female and male to female ratio 1:4.3(TGBE1), age ranges from 10-70 years, mean age 38.5±8.10, most of the patients belongs to 31-40 years of age. In our study the highest prevalence of thyroidectomy was in women (81.19 %). In line with this study Yan et.al showed that of 7385 patients undergoing thyroidectomy ratio of male to female was

1:5.24, while the mean age of patient was more than 40 years^(R^{16 F}). In fact, overall the findings of many epidemiological studies indicated prevalence of thyroid disorders among women than man [20,21] Out of 218 thyroid diseases 79 was carcinoma thyroid, most common age group was 31-40 years' group. Rest of 139 were benign thyroid diseases. This group most common age group 31-40 years. Among the 218 patients 138 cases were benign thyroid lesion which were nodular goiter (63.30%) follicular adenoma (0.031 %), Toxic MNG (0.0181 %), 79 cases of carcinoma thyroid among which 74 were papillary ca thyroid (33.94 %), 02 were follicular carcinoma (0.009 %) and 03 were medullary carcinoma (0.0131%). Out of 218 cases 79 were malignant, 28 patients had lymph node metastasis. Patients with benign thyroid lesion underwent 34 hemithyroidectomy for nodular goiter (15.59%), 8 hemithyroidectomy for follicular adenoma (0.036%) multinodular goiter involving both lobe of thyroid done total thyroidectomy was 92 (42.20 %). PTC underwent total thyroidectomy with central neck dissection 40 (18.34 %), total thyroidectomy with CND + SND (level II to IV) 23 cases (10.55%), total thyroidectomy with CND + Bilateral MRND 02 cases (0.009%), and completion thyroidectomy 8 cases (0.036 %), 4 cases of follicular carcinoma done total thyroidectomy with CND (0.0183 %) and 4 cases of toxic MNG done total thyroidectomy (0.0183 %). In our study most common complication was temporary para-thyroid insufficiency 47 cases (4.14 %), and permanent parathyroid insufficiency 2 cases (0.011%), up to one year follow up. In many previous studies, hypocalcemia was reported about 2%-55% and 0.4%-13.8 % respectively [22-25]. Suwannasarn et al. reported immediate hypocalcemia was observed is 38.5.5% of patients [25]. The lower rate in our study may be due to identification of parathyroid gland and maintain its vascularity.

CONCLUSION

Lateral approach to thyroid is a safe alternative to the standard approach for re-exploratory thyroid surgery. Lateral approach to thyroid is an alternative to both conventional thyroidectomy and for parathyroid explorations.

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