



Original Research Article

A STUDY OF RECURRENT LARYNGEAL NERVE IN THYROID SURGERY

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Received : 03/06/2026
Received in revised form : 02/07/2026
Accepted : 16/07/2026

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DOI: 10.70034/ijmedph.2026.3.936

Source of Support: Nil,

Conflict of Interest: None declared

Int J Med Pub Health
2026; 16 (3); 6075-6082

ABSTRACT

Background: Objective: To evaluate anatomical variations and surgical relationships of the recurrent laryngeal nerve (RLN) during thyroid surgery to improve identification and reduce nerve injury. **Study Design:** Prospective observational study. Setting: Tertiary care hospital in Maharashtra, India. Participants: 104 patients undergoing thyroidectomy for benign thyroid conditions between November 2018 and October 2020.

Materials and Methods: Intraoperative RLN identification was performed in all cases. Its relationship with key anatomical landmarks—inferior thyroid artery (ITA), ligament of Berry, and Zuckerkandl tubercle—was assessed. RLN branching patterns and side-wise variations were also analyzed.

Results: Thyroid swelling was more common in females (90%). Hemithyroidectomy was the most common procedure (77.9%). The Zuckerkandl tubercle was identified in 87.75% of cases and proved a reliable landmark for RLN identification. The RLN was most commonly located posteromedial to the tubercle (81.84%) and posterior to branches of the ITA. In relation to the ligament of Berry, the RLN had a posterolateral course in 85.82% of cases. A pyramidal lobe was present in 62.5% of patients.

Conclusion: The RLN shows consistent yet variable anatomical relationships. The Zuckerkandl tubercle and ITA are reliable landmarks for identification. Careful dissection using these landmarks reduces the risk of RLN injury during thyroid surgery.

Keywords: Thyroidectomy; Recurrent laryngeal nerve; RLN palsy; Inferior thyroid artery; Berry ligament; Zuckerkandl tubercle; Anatomical variation.

Key points

1. The recurrent laryngeal nerve (RLN) demonstrates significant anatomical variability. This variability makes intra-operative identification challenging and increases the risk of nerve injury during thyroid surgery.
2. The Zuckerkandl tubercle is a consistent and reliable landmark. This consistent positional relationship helps surgeons anticipate the nerve's course during dissection.
3. The RLN is most commonly located posteromedial to the Zuckerkandl tubercle. It was identified in the majority of cases and serves as an important guide for locating the RLN intraoperatively.
4. The RLN commonly lies posterior to the inferior thyroid artery and posterolateral to Berry's ligament. Understanding these relationships is crucial for safe thyroidectomy and avoiding nerve injury.
5. Meticulous dissection using anatomical landmarks reduces RLN injury. Systematic identification of the nerve significantly improves surgical outcomes and minimizes complications.

INTRODUCTION

Thyroid surgery is one of the most commonly performed procedures in head and neck surgery.

Recurrent laryngeal nerve palsy (RLNP) is one of the most common and most feared complications of thyroid gland surgery. Iatrogenic RLN injury is a cause of vocal cord paralysis. A good knowledge of the anatomy of the thyroid region is important to avoid RLN lesions. It has now been clearly established that visualisation of the RLN remains the chief factor determining preservation of nerve function and a decreased incidence of postoperative recurrent laryngeal nerve palsy.^[1]

Systematic dissection of the RLN has therefore become the standard technique to reduce the risk of recurrent laryngeal nerve palsy. The risk of RLN injury has been ascribed to many factors, including malignancy, prior thyroid surgery, irradiation, Graves' disease, and anatomic variability or anatomic distortion.^[2]

Visualisation of the anatomical landmarks of the recurrent laryngeal nerve with branches of the inferior thyroid artery (ITA), Berry ligament, Zuckerkandl tubercle and its Branching pattern remains essential for preservation of recurrent laryngeal nerves.^[3]

Classically, the right recurrent laryngeal nerve more frequently presents a pre-vascular course than the left recurrent laryngeal nerve, as it rises higher than the left nerve and has a more oblique course. The area around the Berry ligament and the area that the nerve passes under the cricothyroid muscle face us as the areas that the injury risk during the surgery is the highest. Anatomically, the course of the recurrent laryngeal nerve is close to the trachea after it passes by the inferior pole of the thyroid.^[4] That there's no reliable landmark for the identification of the RLN is a crucial problem. The surgeon has to rely on interplay to various landmarks. Several studies of the anatomy of the recurrent laryngeal nerve and the anatomical relations with the ITA have been conducted. However, its relations are not consistent. The objective of this study was to describe the various anatomical relations of the RLN during thyroid surgery in a rural population.^[5]

Aim and objectives

1. To obtain reliable anatomical relations of recurrent laryngeal nerve with. a) Inferior thyroid artery (ITA).
b) Berry ligament.
c) Zuckerkandl tubercle.
2. To study Branching patterns of recurrent laryngeal nerve.
3. To study Anatomical course of right and left recurrent laryngeal nerve.

Review and literature

Thyroid gland derives its name from the Greek *thyreos* or shield and the term thyroid gland was 1st coined by Thomas Wharton in 17th century to describe the gland in close proximity to the shield

shaped thyroid cartilage.^[6] He named it as *Glandularis thyroideis* in 1656 in his book —*Adenographia*. As per literature available in countries outside India, enlargement of thyroid gland affects up to 60% of the population with higher frequencies in women and elderly.^[11] Thyroidectomy is performed in the treatment of thyroid cancer and benign diseases which gives rise to compression of the oesophagus or trachea, causing dysphagia or stridor, for thyrotoxicosis. complications can be significantly reduced by considering the anatomical relationship of the thyroid gland and the following structures which can be considered as salient anatomical landmarks during thyroid surgery are:

- 1) Recurrent laryngeal nerve
- 2) External laryngeal nerve
- 3) Thyroid vessels
- 4) Tubercle of Zuckerkandl

Surfaces and relation recurrent laryngeal nerve

The external laryngeal nerve is medial to this part of the gland as it passes to supply cricothyroid. Inferiorly, the trachea and, more posteriorly, the recurrent laryngeal nerve and oesophagus (which is closer on the left) are medial relations.

The posterolateral surface of the thyroid gland is close to the carotid sheath, and overlaps the common carotid artery. The thin anterior border of the gland, near the anterior branch of the superior thyroid artery, slants down medially.^[7]

Surgical anatomy of recurrent laryngeal nerve

RLNs origin and course on the two sides of the body. On the right side, it arises from the vagus nerve in front of the subclavian artery. Near the lower pole of the lobe of the thyroid gland the nerve is always intimately related to the inferior thyroid artery. The relations of the RLN to the inferior thyroid artery are highly variable and will be described later. On the left side, it arises from the vagus nerve on the left of the arch of the aorta and winds below the arch immediately behind the attachment of the ligamentum arteriosum to the concavity of the arch and then ascends to the side of the trachea. The nerve on each side ascends in or nearer the groove between the trachea and, near the 2nd/ 3rd tracheal ring it passes behind the thyroid gland under the lower border of the inferior constrictor and enters the larynx behind the articulation of the inferior Cornu of the thyroid with the cricoid cartilage.^[8]

Anatomical variation of recurrent laryngeal nerve and its surgical importance

The exact relationship between the terminal branches of the nerve and of the artery are extremely difficult to follow since the artery may be absent, may divide into two main branches well lateral to the gland, or may have as many as 4-6 terminal branches while the nerve itself may be undivided as it enters into the larynx or it may have as many as six branches. Thus, considering these different patterns, Reed described 28 different types of relations and Bowden described 60 different types of relations.

But for convenience, we will consider 8 main variations of surgical significance (Wade 1957).

Group 1- Nerve superficial to the trunk or to the two divisions

Group 2- Nerve deep to the trunk or to the two divisions

Group 3 - Nerve between the two divisions

Group 4 – Nerve between the glandular branches of the inferior division

Group 5- Nerve between the glandular branches of the superior division-

Group 6 – Inferior nerve between the glandular branches of the superior and inferior division

Group 7 - No inferior thyroid artery

Group 8 - Anomalous nerve

Nerve between the glandular branches of the inferior division

Nerve between the glandular branches of the superior division

Nerve between the glandular branches of the superior and Division.

No inferior thyroid artery

Approach to the Recurrent Laryngeal Nerve Dissection at the Cricothyroid Junction

Thyroid surgeries are the most frequent operations performed by head and neck surgeons in the United States. 2015 American Thyroid Association Guidelines recommend “Visual identification of the recurrent laryngeal [RLN] during dissection in all cases” on moderate- quality evidence. Three approaches to RLN identification have been described: lateral approach, inferior approach, and the superior approach. The lateral approach is routinely used by most surgeons for uncomplicated thyroid surgery and was advocated since the time of Theodor Kocher. In this approach the thyroid lobe is retracted medially, middle thyroid vein is divided, and the RLN is identified at the mid-polar level.

For revision cases and for goitre surgery, the inferior approach is often used. In this approach the RLN is found in the soft areolar tissue in the tracheoesophageal groove proximal to the inferior thyroid artery crossing point. One advantage of this technique is that the RLN is found proximally prior to extra-laryngeal branching and away from thyroid bed scarring that might have been caused by prior surgery. The superior approach is the least used approach. In this approach, the RLN is identified as it enters under the inferior constrictor muscle proximal to the cricothyroid junction. This approach is advantageous as the RLN position relative to the cricothyroid junction is consistent regardless of thyroid pathology and congenital variations. The surgical technique for the superior approach has not been described in sufficient detail and its outcomes have not been documented well in literature. Only three studies report on the routine use of the superior approach: one study used a single sentence to describe the surgical technique, and the authors of the other two studies followed a technique that appears to be a modification of the lateral approach. In this technique the thyroid is retracted medially, and the RLN is found by searching between Zukerkandl’s tubercle and the

cricopharyngeus muscle. Thus, the RLN is not found right at the cricothyroid junction. While a method of identifying the RLN at the cricothyroid junction is likely known to experienced thyroid surgeons, this method has not been described in detail nor evaluated previously in literature. The main objective of this study was to describe a four-step standardised surgical technique to identifying the RLN at the cricothyroid junction (subsequently referred to as the retrograde medial approach). The primary outcome of interest was the rate of surgical complications (temporary and permanent hypocalcemia and vocal cord palsy). The secondary outcomes were surgical time and conversion rate to other techniques.

MATERIALS AND METHODS

Study Centre: ENT in patient department of a tertiary care hospital in Maharashtra, India.

Study Population: Patients undergoing Thyroidectomy ENT unit in tertiary care hospital in Maharashtra, India.

Sample Size: All patients presenting with Benign conditions of thyroid gland admitted in ENT wards in tertiary care hospital in Maharashtra, India.

Study Design: Prospective, Observational Study.

Period of Study: Two years [1st November 2018 to 31st October 2020].

Inclusion Criteria

- 1) Patients of all age groups and either gender, presenting with Benign conditions of the thyroid gland.
- 2) Both male and female patients. thyroid gland lesions confirmed by USG and FNAC.
- 3) Patients who give consent to being a part of the study.

Exclusion Criteria

- 1) Malignant conditions of thyroid gland.
- 2) Revision surgery for thyroid gland.
- 3) Patients having retrosternal goiter.
- 4) Patients not willing to participate in the study.

Clinical presentation was studied in detail with respect to their history symptoms (presenting complaint), followed by clinical examination. History obtained, included details of swelling like onset, duration and rate of growth, whether the patient had any obstructive symptoms due to swelling. Symptoms and signs of thyrotoxicosis and hypothyroidism were also looked for in detail. Local examination of gland included.

Methodology

Inspection

The gland was inspected from the front. In short necked individual Pizzillo’s method was used. The inspection of thyroid gland rendered easier by patient throwing her/his head backward and pressing her occiput against her clasped hands. Movement with protrusion of tongue, movement with deglutition and retrosternal extension if any noted.

Palpation

Palpation of each lobe was carried out by Lahey 's method. In Lahey's method examiner stands in front of the patient. To palpate the left lobe properly, the thyroid gland is pushed to left from the right side of the left hand of the examiner. This makes the lobe more prominent, so that the examiner can palpate thoroughly with his right hand. During palpation, the patient is asked to swallow and size, surface, consistency, mobility, to get below the swelling is noted. Kocher's test is done to rule out tracheomalacia. In Kocher's test slight push on the lateral lobe will produce stridor suggestive of positive Kocher's test. The Crile's method was also used. In this, keeping a thumb on the gland, the patient is asked to swallow and examiner feels for nodularity. Cervical Lymph nodes examined.

Percussion:

Done on manubrium sterni to exclude retrosternal extension.

Auscultation:

Look for systolic bruit.

Investigation:

Besides routine investigations, specific investigations include

Thyroid function test:

Thyroid function test was done in every patient to assess functional status. Triiodothyronine (T3), tetraiodothyroxine (T4) and thyroid stimulating hormone (TSH) were done regularly. Normal values are

T3 : 100-200ng/dl

T4 : 4.4-12.5mcg%

TSH : 0.4-4.0 mIU/L

One in 35 patients had h/o hypothyroidism and was on the treatment for the same. Her status at the time was surgery was euthyroid.

USG guided Fine Needle Aspiration Cytology:

In our setup all FNAC were done under USG guidance, as with this it is easy to take samples from different affected lobes, which are not clinically appreciated. In the year 2007, the National Cancer Institute (NCI), Bethesda, Maryland, United States, organized the NCI Thyroid Fine Needle Aspiration State-of-the-Science Conference, and an initiative was undertaken to publish an atlas and guidelines using a standardised nomenclature for the interpretation of thyroid fine needle aspirates (FNAs), known as the Bethesda system for reporting thyroid Cytopathology. The atlas describes six diagnostic categories of lesions:

- 1) Non-diagnostic/unsatisfactory
- 2) Benign,
- 3) Atypical follicular lesion of undetermined significance (AFLUS), 4) Suspicious for follicular neoplasm(SFN)
- 4) Suspicious for malignancy (SM),
- 5) Malignant.

The six diagnostic categories of the Bethesda system have individual implied risks of malignancy that influence management paradigms.

Material for Needle Aspiration Cytology:

a. 10 or 20 cc disposable syringe.

b. 22 or 23 gauge disposable needles (1.5 inches) c.

Slides and cover slips

d. Fixative in Copin jar, 95% alcohol

e. Methylated spirit

f. Cotton Swabs

g. Stains: Papanicolaou Stain

h. Microscope

X- Ray neck and x ray chest:

It was done to rule out tracheal shift. Soft tissue extension in the retro sternum was noted in lateral view. X-rays were also done to rule out any cervical spine pathology to prevent injury to the cervical spine in the hyper-extended position during operation.

Indirect laryngoscopy:

It is done as routine in all cases preoperatively and postoperatively to know the vocal cord status. It was also carried out for medicolegal record. In all patents postoperatively indirect laryngoscopy (IDL) was done to rule out recurrent laryngeal nerve injury.

Ultrasound examinations:

Sonography was done in all the patients to note following findings:

1. About the nature of swelling i.e solid or cystic.
2. Identify Nodules, number, size, Vascularity, Echogenicity and Microcalcification.
3. Identify Neck Lymph nodes.

CT scan:

The CT scan was done in suspected cases with enlarged nodular thyroid gland, thyroid mass and to assess extra glandular extension and metastatic lymph nodes in neck, upper mediastinum and for retrosternal extension.

ECG:

ECG was done as routine in all patients.

Preanesthetic check up

The patient was examined by the anaesthetist and fitness was given. Cardiorespiratory Status was advised in certain cases, which was taken by physicians. After obtaining fitness, the patient was subjected to surgery.

RESULTS

A total of 104 cases coming in the ENT OPD of a tertiary care center with a thyroid swelling and thyroid status was examined from 1st November 2017 to 31st October 2020 and the following data was observed.

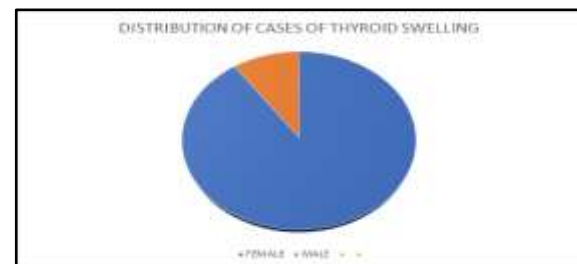


Figure 1: The distribution of cases of thyroid swelling according to gender
Male -10%, Female 90%

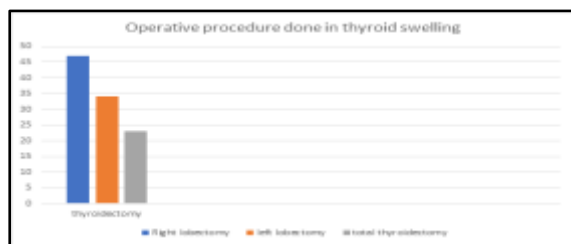


Figure 2: Operative procedure done in case of thyroid swelling, Hemithyroidectomy- 77.9%, Total thyroidectomy 22%.

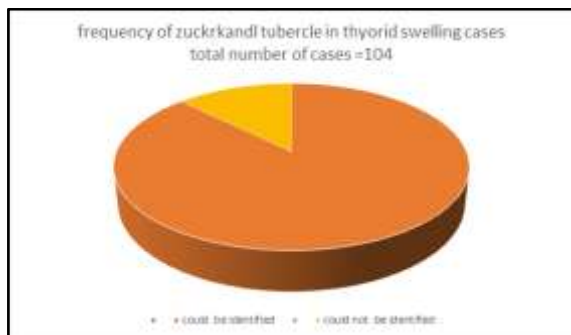


Figure 3: Frequency of zuckerandl tubercle in thyroid swelling cases =104 Present 87%, Absent 12%.

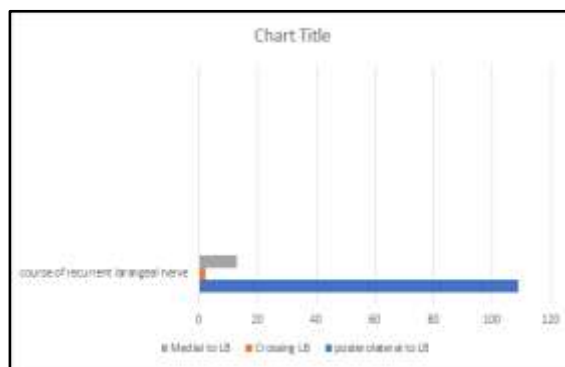


Figure 4: Relationship of branching pattern of RLN with TZ during thyroid surgery posteromedial-81.16%, lateral - 10% , Anterior-8.16%.

Table 1: The distribution of cases of thyroid swelling according to gender

Gender	No.case	Percentage (%)
Female	94	90%
Male	10	10%
Total	40	100%

In our study, 104 cases of thyroid swelling were studied out of which 94 cases, i.e. 90.0% were females while 10 cases i.e. 10.0% were males.

Table 2: Operative procedure done in cases of thyroid swelling

	Operative procedure			Percentage
	Right lobe	Left lobe	Total	
Hemithyroidectomy	47	34	81	77.90%
Total Thyroidectomy			23	22.10%
Total			104	100%

[Table 2] shows that out of 104 patients, 81 underwent Hemithyroidectomy i.e 77.90 % and 23 underwent total thyroidectomy i.e. 22.10 %. From the

above table we can say that RLN was identified at 127 incidences.

Table 3: Frequency of Zuckerandl tubercle in thyroid swelling cases Total number of cases= 104

Tubercle of Zuckerandl		
Could be identified	111	87.75 %
Could not be identified	16	12.25%

[Table 3] shows that out of 104 thyroidectomies, TZ was present in 111 incidences i.e 87.75.5 % and was absent in 16 incidences, i.e. In 12.25 %.

Table 4: Relationship of branching pattern of RLN with TZ during thyroid surgery Total number of cases= 104

	Relation of RLN with TZ		Percentage
RLN anterior to zuckerandl tubercle	5	5	8.16%
RLN lateral to Zuckerandl Tubercle	5	7	10.00%
RLN posteromedial to Zuckerandl Tubercle	30	74	81.84%

RLN: recurrent laryngeal nerve; TZ: Tubercle of Zuckerkandl

Table no 4 shows that among 104 patients, total 10 incidences (out of which for Right RLN n=5; Left RLN n=5) showed relation of branching of RLN anterior to TZ, i.e., 8.16 %; total 13 incidences (out

of which for Right RLN n=5; Left RLN n=7) showed the relation of branching of RLN lateral to TZ i.e., 10.00 % and total 104 incidences (out of which for Right RLN n=30; Left RLN n=74) showed the relation of branching of RLN posteromedial to TZ i.e. 81.63%.

Table 5: Relation of RLN With ITA (Inferior Thyroid Artery) During Thyroid Surgery Total Number of Cases= 104

	Relation of RLN with ITA left side		Relation of RLN with ITA right side	
	Frequency	Percentage	Frequency	Percentage
ANTERIOR TO MAIN TRUNK OF ITA	11	8.61%	7	6.12%
POSTERIOR TO MAIN TRUNK OF ITA	13	10.20%	7	6.12%
ANTERIOR TO BRANCH OF ITA	7	6.12%	10	8.16%
POSTERIOR TO BRANCHES OF ITA	31	24.49%	20	16.32%
BETWEEN BRANCHES OF ITA	10	8.16%	7	6.12%

[Table 5] shows that the maximum no of patients, 31 on left side, i.e. 24.49% and 20 on right side, i.e. 16.32% had RLN posterior to the branches of ITA; while 7 on left side, i.e. 6.12% and 10 on right side i.e. 8.16% had RLN anterior to the branches of ITA. Similarly, On the left side, 13 patients, i.e. 10.20% and on the right side 7 patients i.e. 6.12% had RLN

posterior to the main trunk of ITA. While, on left side, 11 patients, i.e. 8.61% and on right side 7 patients, i.e.

6.12% had RLN anterior to the main trunk of ITA. Likewise, on left side 10 patients, i.e., 8.16% and on the right side 7 i.e., 6.12% had RLN passing between the branches of ITA.

Table 6: Relationship of RLN with suspensory ligament of Berry (LB) Total number of cases= 104

Course of RLN	Sites	Percentage
Posterolateral to LB	109	85.82%
Crossing LB	5	4.08%
Medial to LB	13	10.20%

[Table 6] shows that among 104 cases, at 109 incidences i.e. 85.82%, RLN had posterolateral course with respect to LB while at 13 incidences i.e.

10.20%, %, RLN had medial course with respect to LB and only 5 incidences i.e. 4.08%, fibers of RLN crossed LB.

Table 7: Frequency of Pyramidal Lobe During Thyroid Surgery

Tubercle of Zuckerkandl		
Could be identified	111	87.75 %
Could not be identified	16	12.25%

[Table 7] shows that 65 patients, out of 104, had a pyramidal lobe and in others, it was absent.

DISCUSSION

The present study was a hospital based prospective observational study done in Department of ENT at a tertiary care hospital, from period of 1st November 2017 to 31st October 2020. The study includes 104 cases of benign thyroid lesion undergoing thyroidectomy.^[9]

In the present study, female to male ratio was 9:1 suggestive of female predominance and contributing almost 90% of the total student population. This is supported by Chetan VR et al. A study in 2013, who reported that 63 females & 10 males had thyroid swelling, with female to male ratio of 6.3:1 (Chetan 2013). In another study by Nirav et al. [206] in 2013, out of 35 cases of thyroid swelling, female to male ratio was about 7.7 :1. Buzdar et al. In 2014 observed

that female to male ratio of thyroid swelling was 7:1.^[10]

Operative procedure in thyroid swelling cases:

In the present study, in 104 operated cases of thyroid swelling. Hemithyroidectomy was the most common operation perform in 77.50% of cases followed by total thyroidectomy (22.50%). This was consistent with the study of Chetan et al. [205] in which 90% patients undergone hemithyroidectomy.

The findings of present study were similar to that of Satihal et al. done in 2014 in 25 patients, 21 patients underwent hemithyroidectomy (84%), 4 patients underwent total thyroidectomy (16%).^[11]

Anatomical landmarks observed during thyroid surgery

1) In our study, total 104 cases underwent thyroid surgeries out of which RLN was found at 127 incidences. Tz was found at 111 incidences out of

127 incidences i.e. 87.75%. This is supported by a study by Mazumder et al. Which found 90% of the patient had a recognisable TZ. Singh et al,^[12] Their study noticed that TZ was found on right side (85.41 % i.e. 123 out of 144), 81.41 % (92 out of 113) to the left side 15.68 % (8 out of 51) were bilateral.

- 2) In our present study, among 104 patients, total 10 incidences (out of which for Right RLN n=5; Left RLN n=5) showed relation of branching of RLN anterior to TZ, i.e., 8.16 %; total 12 incidences (out of which for Right RLN n=5; Left RLN n=7) showed the relation of branching of RLN lateral to TZ i.e., 10.00 % and total 104 incidences (out of which for Right RLN n=30; Left RLN n=74) showed the relation of branching of RLN posteromedial to TZ i.e. 81.84%. Our results were closer to a study done by Singh et al. In which RLN was found posterior to the tubercle in 97.22% (175 out of 179) cases.^[13]
- 3) In our study of 104 cases, 42.85% (i.e. at 51 out of 127 incidences) showed the relation of RLN with ITA on the right side while 57.14% (i.e. at 72 out of 127 incidences) showed the relation of RLN with ITA on left side. This is supported in a study by P. V. Pradeep et al, reported two or more branches in 31.42% on the right side and 29.2% on the left. Serpell et al, had revealed RLN branching in 64.53%. In study by Casella et al,^[14] who noticed that RLN had branches in 25.7% on the right side and 22.9% on the left.

In our study, the maximum no of patients, 31 on left side, i.e. 24.49% and 20 on right side, i.e. 16.32% had RLN posterior to the branches of ITA; while 7 on left side, i.e. 6.12% and 10 on right side i.e. 8.16% had RLN anterior to the branches of ITA. Similarly, on the left side, 13 patients, i.e. 10.20% and on right side 7 patients i.e. 6.12% had RLN posterior to the main trunk of ITA. While, on left side, 11 patients, i.e. 8.61% and on right side 7 patients, i.e. 6.12% had RLN anterior to the main trunk of ITA. Likewise, on left side 10 patients, i.e., 8.16% and on right side 7 i.e., 6.12% had RLN passing between the branches of ITA. In a study conducted by Priyanka Singh et al. ITA was anterior to RLN in 70.89% and posterior to RLN in 29.10%. Another study by A. N. Hisham, et al., 372 (83.8%) nerves were described to be posterior and intertwined between the branches of the ITA, and in 72 (16.2%) RLNs, they were observed to be anterior to the ITA.

4) In the present study, out of 104, 65 cases, i.e. 62.50 % had a pyramidal lobe. This is supported by following studies: Kim et al, reported a prevalence of 59.8% in 132 patients who underwent thyroid surgery. Ryu et al, have detected PL during thyroid surgery in 60% of 135 patients. Zivic et al,^[15] found the PL in 61% of 100 thyroid.

From the above discussion, we can say that the Ligament of Berry could be identified, but during dissection, bleeding occurs there so RLN could not be easily identified. But TZ was easily identified and as TZ is dissected with utmost efforts, RLN too could

be easily identified. ITA too was carefully dissected which made it easy to identify RLN but it became difficult to identify at LB.^[16]

Summary

The present study was carried out in the department of ENT, in Tertiary Care Centre, from 1st November 2017 to 31st October 2020. A study was conducted on selected 104 cases of thyroid swelling coming to OPD of the department of ENT.

- 1) Out of total 104 cases, 94 (90%) were females while 10 (10%) cases were males.
- 2) Maximum 81 (77.50%) cases underwent hemithyroidectomy while in 23 (22.50%) cases total thyroidectomy was performed.
- 3) TZ was present at 111 out of 127 incidences (82.50%) out of 127 cases and was absent in 16 out of 49 incidences (17.50%) out of 40 cases.
- 4) Out of 104 patients, total 11 incidences showed relation of branching of RLN anterior to TZ, i.e., 8.16 %; total 13 incidences showed the relation of branching of RLN lateral to TZ i.e., 10.20 % and total 104 incidences showed the relation of branching of RLN posteromedial to TZ i.e. 81.63%.
- 5) Maximum no of patients, 31 on left side, i.e. 24.49% and 20 on right side, i.e. 16.32% had RLN posterior to the branches of ITA; while 7 on left side, i.e. 6.12% and 10 on right side i.e. 8.16% had RLN anterior to the branches of ITA. Similarly, On the left side, 13 patients, i.e. 10.20% and on right side 7 patients i.e. 6.12% had RLN posterior to the main trunk of ITA. While, on left side, 11 patients, i.e. 8.61% and on right side 7 patients, i.e. 6.12% had RLN anterior to the main trunk of ITA. Likewise, on left side 10 patients, i.e., 8.16% and on right side 7 i.e., 6.12% had RLN passing between the branches of ITA.
- 6) Out of 104 cases, at 109 out of 127 incidences i.e. 85.71% RLN
- 7) had posterolateral course with respect to LB while at 13 out of 127 incidences i.e.
- 8) 10.20%, RLN had medial course with respect to LB and only 5 out of 127 incidences i.e. 4.08%, fibers of RLN crossed LB.
- 6) In 25 patients (62.50%), out of 40, pyramidal lobe was present and in others it was absent.

CONCLUSION

The incidence of thyroid swelling was more common in females than males.

Hemithyroidectomy was commonly performed in maximum cases. Maximum cases had the presence of TZ which served as a useful landmark for identification of the RLN. RLN mostly had inferior relations with TZ and thus lower chances of getting injured during surgery. The Lore's triangle is an important anatomical landmark for identification of the RLN. RLN mostly traversed posterior to ITA.

Ligament of Berry constitutes an important landmark of the course of RLN before it enters the larynx. Cernea's classification type I was most commonly found. Pyramidal lobe was found in 25 (62.50%) cases.

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