Original Research Paper

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Otorhinolaryngology

A STUDY OF ANATOMICAL VARIATIONS AND PRESERVATION OF SUPERIOR LARYNGEAL NERVE AND ITS BRANCHES DURING THYROID SURGERIES

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ABSTRACT **Objective:** To describe the anatomic variations of the SLN: specifically in relation to EBSLN and to propose a systematic approach to identification and preservation of this nerve; and to define the identification rate of this nerve during thyroidectomy and to preserve it by avoiding iatrogenic injury to the nerve. **Methods:** A observational study was performed on 60 patients . After written informed consent Patients were evaluated by detailed clinical ENT examination followed by necessary thyroid investigation ,radiological investigation which will be maintained in a systematic record sheet and assessed . The variations and preservation of superior laryngeal nerve were studied during the thyroid surgeries. **Results:** Type 1 of External branch of superior laryngeal nerve is the most common type in this study.

KEYWORDS : External branch of superior laryngeal nerve, Thyroid surgery, Anatomical variations, Cernea classification.

INTRODUCTION

Most endocrine surgeons have focused on preserving the recurrent laryngeal nerve (RLN) due to it's common complications (such as hoarseness, dysphagia, and aspiration) during thyroidectomy. Therefore, the clinical importance of the external branch of the superior laryngeal nerve (EBSLN) has been less emphasized and gets small consideration during thyroidectomy. However, the EBSLN innervates the cricothyroid muscle; super energetic phonation and the frequent occurrence of voice fatigue may result from damage to this nerve, which can negatively affect patient quality of life after surgery. Therefore, the importance of preserving this nerve has been greatly emphasized.[1-6]

The superior laryngeal nerve (SLN) starts commonly from the vagus nerve at the level of the C2 vertebra and descends medially toward the thyrohyoid membrane (TM), the membrane between the thyroid cartilage and the hyoid bone. Its position was found to be mostly symmetrical between the right and left sides.

The SLN branches into internal and external branches deep into the internal carotid artery. The internal branch of the superior laryngeal nerve (ibSLN) passes immediately inferior to the greater horn of the hyoid bone, and approaches the TM accompanied by the superior laryngeal artery (SLA), a branch of the superior thyroid artery (STA)[7]. Both the ibSLN and the SLA pierce the external surface of the TM . ibSLN is divided into three branches. The superior branch of the ibSLN innervates the mucosa of the epiglottis and a little portion of the anterior wall of the vallecula. The middle branch is sensory, which innervates the aryepiglottic folds. The inferior branch sends a few twigs to the interarytenoid muscles. The EBSLN descends posterior to the sternothyroid muscle and the superior thyroid artery to supply the inferior constrictor and cricothyroid muscle.[7-11]

Cernea et al[12] in 1992 randomized 76 patients into three groups based on whether the first author performed the superior thyroid pole dissection with a search for the superior laryngeal nerve with a nerve stimulator, or whether the dissection was performed without a search for the nerve.

Cernea et al.[11] proposed their nomenclature in 1992 and since then this has been the most extensively acknowledged classification. It categorizes the position of the EBSLN in relation to the superior pole of the thyroid or the STV, as follows:

Type 1: the nerve crosses the superior vessels more than 1 cm above a plane tangent to the edge of the superior pole;

Type 2a: it crosses the vessels within 1 cm above the upper limit of the superior pole

Type 2b: the nerve curves in its travel to the CTM bellow the upper edge of the superior pole. This position represents the greatest risk of injury and has been described by the author in 14% of patients with small lobes and in 54% of patients with very large goiters.[1,11]

With newer techniques such as minimal access thyroidectomy[12] and even transplantation of the larynx[13,14] , identification and preservation of the EBSLN remain as relevant as ever. The SLN arises from the vagus nerve or the nodose ganglion close to the jugular foramen and descends posterior to the carotid arteries toward the larynx[15,16]. En route the SLN crosses anterior to the superior cervical sympathetic ganglion (SCSG)/ cervical sympathetic chain (CSC) and posterior to the internal carotid artery (ICA). At this level, the SLN receives a sympathetic branch from the SCSG that contributes to the innervation of the carotid body[17] and the thyroid gland[18]. Although many authors have mentioned this connection, only a few have described the loop in detail[14,18]. Sun and Chang[18] (1991) found 17 different variations and Furlan[14] five more. Both reports found that the sympathetic chain is connected mainly to the EBSLN in 74–78% of the cases and not to the SLN trunk, as classically described in anatomy textbooks.

While there are new methods in surgical practice to identify the RLN during central neck surgery, there is no clear standard technique for the identification of the SLN . There is also less emphasis in the literature regarding the anatomical variations of the SLN, although it is important to recognize the significant anatomical variations of the SLN among the general population lead to increased vulnerability during surgical procedures of the neck.

Hence the present study was conducted with an aim to describe the anatomic variations of the SLN: specifically in relation to EBSLN and to propose a systematic approach to identify and preserve this nerve; and to define the identification rate of this nerve during thyroidectomy.

AIM AND OBJECTIVES

Aim:

To describe the anatomic variations of the SLN: specifically in relation to EBSLN and to propose a systematic approach to identification and preservation of this nerve; and to define the identification rate of this nerve during thyroidectomy.

Objective:

To determine the anatomical variations and preservation of SLN and it's branches in different thyroid swelling and to preserve it by avoiding iatrogenic injury to the nerve.

MATERIAL AND METHODS

Study Design: Observational study.

Study Period: 2 years (october 2022 to June 2024)

Study Setting: ENT department of MGM hospital , a tertiary care referral center renowned for its expertise in otorhinolaryngology. Situated in Aurangabad.

Study Subjects: Patients presenting to the outpatient department with

anterior neck swelling diagnosed to be a thyroid swelling in its euthyroid state and with no previous neck surgeries or radiations will be included in the study.

Inclusion Criteria:
- Age - 10- 80years
- Sex- Both
- All patients with thyroid swelling, clinical euthyroid status.

Exclusion Criteria:
- Previous head and neck surgery
- Previous history of neck irradiation.

Sample Size:
The sample size was calculated based on the below formula.
n = (Z1)^2{P(1-P)}/d^2

n : minimum sample size : 60
P : your guess of population p(any value<1) : 0.04
1-α: confidence level set by you : 0.95
Z : z value associated with confidence : 1.96
d : absolute precision(value less than P) : 0.05
N = Population size, Z = Critical value of the normal distribution at the required confidence level, p = Sample proportion
Hence a total of 60 cases were included in our study.

Ethical Committee Clearance:
Study was conducted after obtaining permission from institutional ethics committee.

Methodology:
- The patient were informed about the study, its purpose and its methodology and only after obtaining voluntary consent from the patient, a face-to-face interview will be carried out in local language (Hindi/Marathi) at the time of visit to the hospital.
- Patients were evaluated by detailed clinical ENT examination followed by necessary thyroid investigations, radiological investigation which will be maintained in a systematic record sheet and assessed.
- The variations and preservation of superior laryngeal nerve were studied during the thyroid surgeries.

Preoperatively:
- Detailed history.
- General & systemic examination.
- Haematological investigations (Complete blood count, Random blood sugar, Serum creatinine, Blood grouping, Thyroid function test, Serum Ionic Ca++).
- Radiograph of the neck and chest.
- Ultrasonography of the neck.
- Fine needle aspiration cytology of the swelling.
- Pre anaesthetic evaluation.
- A written informed valid consent was taken from all patients.
- Only euthyroid patients were operated.
- direct laryngoscopy done post operative day1 and voice after 3 months

Figure 1: Kocher's incision

Intra Operatively:
- All patients were treated surgically by either total or hemi thyroidectomy.
- Patients were operated under general anesthesia.
- Parts were prepared, painted, and draped.
- Horizontal crease incision was taken 2 cms above sternal notch.
- Skin and subplatysmal flaps were elevated.
- Strap muscles were separated and dissected in midline.
- Right and / or left gland were separated.
- On either or both sides, superior pole was ligated after ligating external branch of superior laryngeal nerve and inferior pole ligated after identifying recurrent laryngeal nerve.
- Right or left hemithyroid gland with isthmus removed with ligation of stump or entire gland removed.
- Well hemostasis achieved.
- Suction drain placed in situ.
- Incision closed in layers and dressing given.

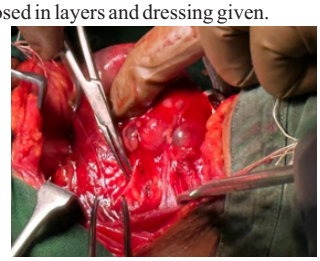

Figure 2: External Branch Of Superior Laryngeal Nerve Type 1

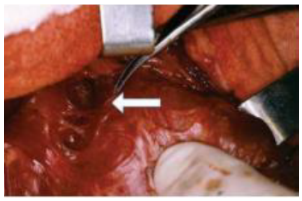

Figure 3 : Type 2b In A Patient With Large Goitre

Figure 4 : Drain Insitu

Figure 5 : Closure With Drain

Postoperatively:
- All patients were kept in wards on iv antibiotics and analgesics.
- Patients were discharged after removal of drain with oral antibiotics & analgesics.
- All patients were called on post op day 7 for removal of dressing & suture cutting & antibiotics were repeated for 1 more week.

Statistical Analysis:
- Data was collected and entered in Microsoft excel.

- Data was analysed using Epi info version 7.2 software.
- Categorical and quantitative data was expressed in number and percentages.

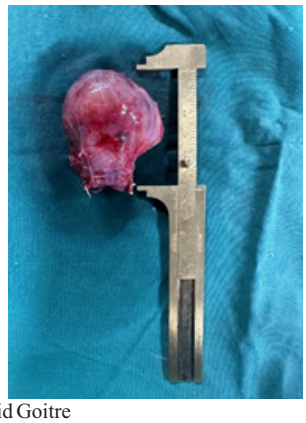

Figure 6 : Colloid Goitre

OBSERVATION AND RESULTS

Table No.1 Distribution Of Cases According To Age

Age groups(in years)	Frequency	Percent
21-30	13	21.67%
31-40	14	23.33%
41-50	06	10.00%
51-60	10	16.67%
61-70	08	13.33%
71-80	09	15.00%
TOTAL	**60**	**100.00%**
Mean age	**48.25±17.69**	
Range	**22-80**	

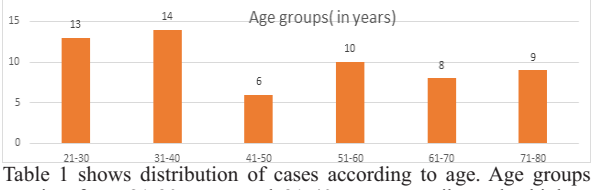

Table 1 shows distribution of cases according to age. Age groups ranging from 21-30 years and 31-40 years contribute the highest percentages at 21.67% and 23.33% respectively, while the 41-50 age group represents 10.00% of cases. The mean age of the cases is 48.25 years, with a standard deviation of 17.69. The age range spans from 22 to 80 years, showcasing the distribution across different age groups.

Table No.2 Distribution Of Cases According To Sex

Sex	Frequency	Percent
Female	45	75.00%
Male	15	25.00%
Total	**60**	**100.00%**

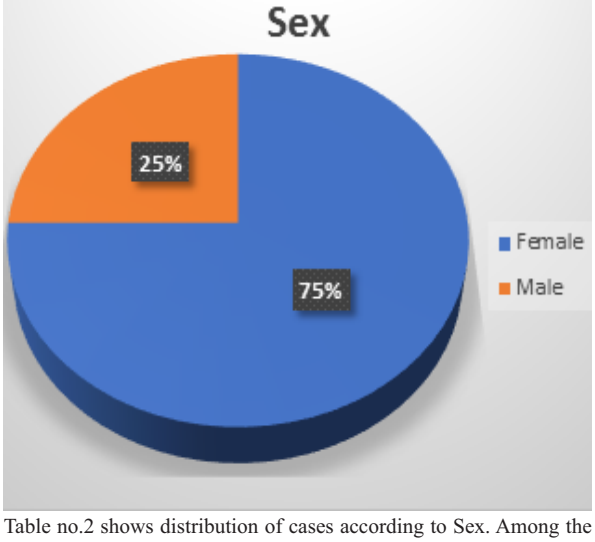

Table no.2 shows distribution of cases according to Sex. Among the total cases, 75% were female, while males accounted for 25% cases.

Table No.3 Distribution Of Cases According To Diagnosis

Diagnosis	Frequency	Percent
Right benign thyroid disease	19	31.67%
Left benign thyroid disease	18	30.00%
MNG	11	18.33%
Retrosternal goiter	01	1.67%
Thyroiditis	03	5.00%
Carcinoma	08	13.33%
TOTAL	**60**	**100.00%**

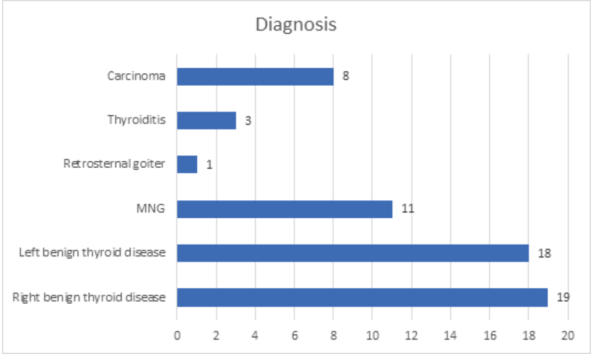

Table no.3 shows distribution of cases according to diagnosis Benign thyroid diseases, including right and left benign conditions, collectively represented 61.67% of cases. Carcinoma accounted for 13.33% of cases, indicating the presence of malignant conditions within the sample.

Table No.4 Distribution Of Cases According To Surgery Done

Surgery	Frequency
Left Hemithyroidectomy	22
Right Hemithyroidectomy	21
Total Hemithyroidectomy	17
Total	**60**

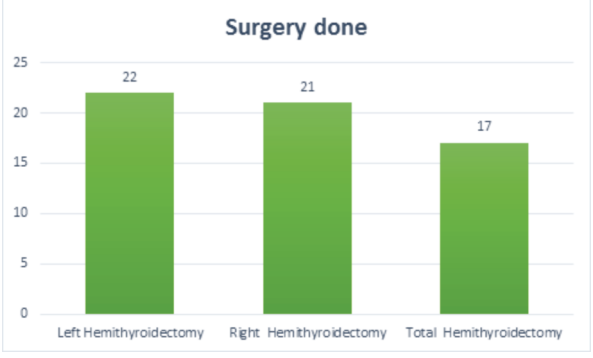

Table no.4 shows distribution of cases according to surgery done.Left Hemithyroidectomy was the most common surgery performed, accounting for 36.67% of cases, followed closely by Right Hemithyroidectomy at 35.00%. Total Hemithyroidectomy constituted 28.33% of surgeries performed.

Table No.5 Distribution Of Cases According To FNAC (Bethesda category)

FNAC(BETHESDA CATEGORY)	Frequency
1	08
2	44
3	04
4	03
5	01
Total	**60**

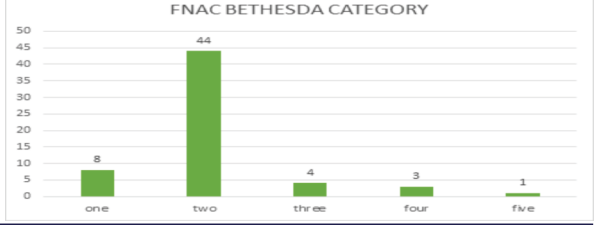

Table no.5 shows distribution of cases according to FNAC(Bethesda category).Category 2 (benign) FNAC results comprise the majority at 73.33%. Other categories, including category 1, 3, 4, and 5, represent smaller proportions of case

Table No.6 Distribution Of Cases According To Histopathological Diagnosis

Histopathological diagnosis	Frequency	Percent
Carcinoma	08	13.33%
Colloid goitre	31	51.67%
Follicular adenoma	09	15.00%
MNG	09	15.00%
Ridel's thyroiditis	03	5.00%
Total	**60**	**100.00%**

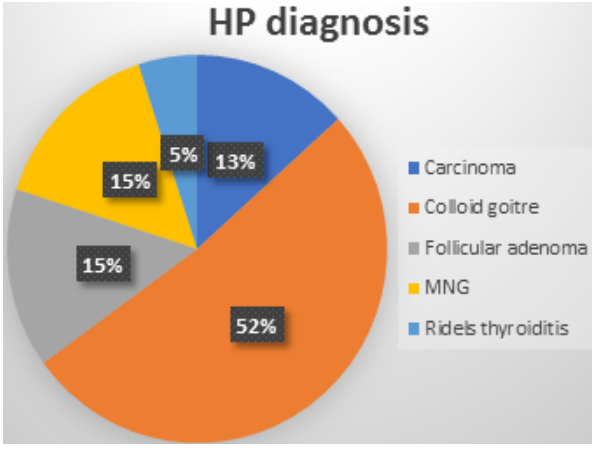

Table no.6 shows distribution of cases according to histopathological diagnosis .Colloid goitre was the most common diagnosis, accounting for 51.67% of cases. Carcinoma represented 13.33% of cases, while other diagnoses such as follicular adenoma and multinodular goitre contribute to the 15% of cases.

Table No.7 Distribution Of Cases According To Location Of External Branch Of Laryngeal Nerve(EBSLN) By Using Cernia Classification

Left EBSLN	Frequency	Percent
1	21	58.33%
2A	9	25.00%
2B	6	16.67%
Total	**36**	**100.00%**
Right EBSLN	**Frequency**	**Percent**
1	21	100.00%
Total	**21**	**100.00%**

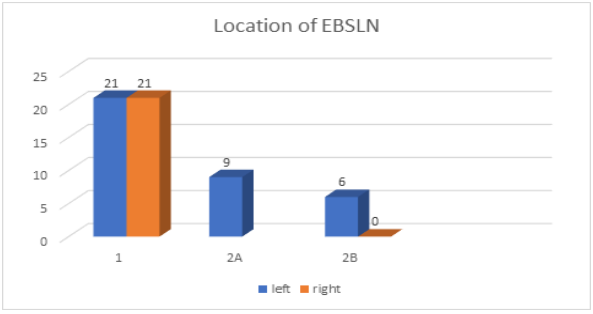

Table no.7 shows distribution of cases according to location of external branch of laryngeal nerve (EBSLN) by using Cernia classification Left EBSLN shows varying percentages across different classifications, with category 1 being the highest at 58.33%. Right EBSLN predominantly falls under category 1, representing 100% of cases.

Table No.8 Distribution Of Cases According To Voice Quality On Direct Laryngoscopy And Post-operative Day 1,at 1 Month And At 3 Months

Voice on day 1 post op	Frequency	Percent
Good	54	90.00%
Hoarse	06	10.00%
Total	**60**	**100.00%**
Voice after 1 month	**Frequency**	**Percent**
Good	58	96.67%
Hoarse	02	3.33%
Total	**60**	**100.00%**
Voice after 3 months	**Frequency**	**Percent**
Good	60	100.00%
Total	**60**	**100.00%**
DL SCOPY on Day 1	**Frequency**	**Percent**
B/L Palsy	01	1.67%
Left Palsy	01	1.67%
Normal	58	96.66%
Total	**60**	**100.00%**

Table no.8 shows distribution of cases according to voice quality on Direct laryngoscopy and post-operative day 1, at 1 month and at 3 months. Voice quality on post-operative day 1 shows 90% with good voice and 10% hoarse. Over time, voice quality improves, with 96.67% reporting good voice at 1 month and 100% at 3 months. Laryngoscopy on day 1 revealed 96.66% with normal findings and only 3.34% exhibiting bilateral or left vocal cord palsy.

DISCUSSION

Thyroid surgery is a worldwide procedure which is performed due to various indications. Several complications arise post thyroidectomy and the quality of voice is one of the most important problems and it is looked upon. In order to preserve the voice and reduce injury to the EBSLN various approaches are used during surgery. The severity would vary according to the voice demands of the individual and is very important in professional voice users and singers. In today's world, with increasing stress on verbal communication and ever-increasing segment of professional voice users, voice has gained far more priority than in the past. Delicate and deliberate surgical technique and careful attention to the details are necessary to prevent complications during surgery. Cernia's classification is of value in identification and preservation and documentation of EBSLN during thyroidectomies in a majority of patients.

Age And Gender Incidence:

In present study, age groups ranging from 21-30 years and 31-40 years contributed the highest percentages at 21.67% and 23.33% respectively, while the 41-50 age group represents 10.00% of cases. The mean age of the cases was 48.25+ 17.69 years. The age range was 22 to 80 years.

The mean age was 37.52+12.9yrs in a study done by **Pradeep et al**[20]. The mean age group was 31-40 years in a study done by **Ekhar et al**[21]. **Khaled et al**[22] found the mean age to be 41.7 years which is lower than our study.

Female predominate in number in the present study as among the total cases, 75% were female, while males accounted for 25% cases. Hence the male to female ratio is 1:3. In a study conducted by **Pradeep et al**[20]**,** the male to female ratio was 1:8. The male to female ratio was 1:6.5 in a study done by **Ekhar et al**[21]**.** In another study by **Athavle at al,** eight were men and 37 were women.

Diagnosis:

In our study, benign thyroid diseases, including right and left benign conditions, collectively represented 61.67% of cases. Carcinoma accounted for 13.33% of cases.

On FNAC, Category 2 (benign) FNAC results comprised the majority at 73.33%.

Kwak et al. reported the US features to be significantly associated with malignancy: solid component, hypo echogenicity, marked hypo echogenicity, micro lobulated or irregular margins, microcalcification, and taller-than-wide shape. **Richards et al**. have reported an inadequate USG guided FNAC rate of 29% in nodules ≥3 cm and **Kim et al.** have reported an inadequacy rate of 9.9% in nodules ≥4 cm.

In a study by **Ho et al.,** who analysed 541 atypia (or follicular lesion) of undetermined significance lesions, malignancy rate was 26.6–37.8%. **Fazeli et al**. reported 15.2% (42/277) and **Sheahan et al**. reported 19% (5/26) of follicular variant of papillary thyroid carcinoma as benign on FNAC.63

Histopathological Diagnosis:

Colloid goitre was the most common diagnosis in our study ,

accounting for 51.67% of cases. Carcinoma was seen in 13.33% of cases, while other diagnoses such as follicular adenoma and multinodular goitre contribute to the 15% of cases.

Ekhar et al[21] diagnosed colloid goitre in 76.67% of patients. Nodular goitre was found to be the most common histopathological diagnosis (24 out of 42 cases) in a study by **Khaled et al**[22]**.**

Surgery Performed:

Left Hemithyroidectomy was the most common surgery performed, accounting for 36.67% of cases, followed closely by Right Hemithyroidectomy at 35.00%. Total Hemithyroidectomy constituted 28.33% of surgeries performed.

In similar study by **Athavle et al**[23], Maximum number of patients, i.e. 24 patients, underwent hemithyroidectomy. Eighteen patients underwent total thyroidectomy with/without neck dissection and the remaining three patients underwent subtotal thyroidectomy.

Cernia Classification Of Type Of EBSLN :

In our study, type 1 being the highest at 58.33%. Type 2 A was seen in 25% cases in left side. Right EBSLN predominantly falls under category type 1, representing 100% of cases.

Meticulous dissection in the region of the upper pole of the thyroid is most important for the proper identification of the EBSLN. The nerve can be identified in most cases irrespective of the pathology and size of the lesion, even malignancy usually does not interfere in the identification of the nerve. Joll's triangle (sternothyroid laryngeal triangle) is an important landmark for the identification of EBSLN.[1] It is formed laterally by the upper pole of the thyroid gland and vessels, superiorly by the attachment of the strap muscles and deep investing layer of fascia to the thyroid and medially by the midline. Its floor is cricothyroid, and its content is EBSLN.[1] It is important to positively identify the nerve as it crosses this relatively avascular space before ligating the vessels, especially in the type IIb cases, where the nerve is at risk of injury during ligation of the vessels close to the gland.[4] Although type IIb is rare, it is most dangerous of the three, and is considered to be most 'at risk' during dissection.[7]

Table Showing Type Of EBSLN In Similar Studies

Similar studies	Type 1	Type 2A	Type 2B
Aina EN et al[41]	17.30%	56%	26.7%
Ozlugedik S et al[73]	22.50%	60%	17.5%
Mishra AK et al[77]	28.20%	53.54%	8%
Pradeep PV et al[69]	70.7%	17.9%	8%
Menon et al[79]	28%	58%	9%
Hwang et al[80]	16.3%	56.5%	27.2%
Present study left side	**58.33%**	**25%**	**16.67%**
Present study right side	**100%**	**-**	**-**

In our study, type 1 nerve was the most common type found. While in other similar studies type 2a was the most common type seen.

Voice Quality Post Surgery:

In present study, voice quality on post-operative day 1 shows 90% with good voice and 10% hoarse. Over time, voice quality improves, with 96.67% reporting good voice at 1 month and 100% at 3 months. Laryngoscopy on day 1 revealed 96.66% with normal findings and only 3.34% exhibiting bilateral or left vocal cord palsy.

Stojadinovic et al[24] reported voice symptoms in 30% of patients at 1 week and 14% at 3 months post-op. **Kaushal et al**[25] reported voice alteration in 23%of patients having thyroidectomy. The immediate post-operative hoarseness of voice could be due to actual injury to the nerve or others causes such as laryngeal edema from intubation, division of the sternothyroid and sternothyroid muscles and disturbance of the laryngotracheal mobility which gradually recovered. **Naraynsingh et al**[26] found hoarseness of voice in 73% of patients within 24 hrs after thyroid surgery. This could be due laryngeal edema from intubation combined with manipulation from thyroidectomy as it settled rapidly down to 11% within 1 week.65

In a study done by **Papadakis**[27], no statistically significant difference was found in any voice parameter, between preoperative and 1-week postoperative assessment regarding the control groups.

In **Selvan et al**[10] **'s** study, 100% of EBSLNs were found using nerve stimulation and EMG of the cricothyroid muscle in 35 patients and 70 nerves at risk. In this study, a considerable number of false positives were seen when visual identification alone was used prior to electrical stimulation. In many cases, non-neural fibres or tendinous fibres of the cricothyroid or inferior constrictor muscles were wrongly assumed to be EBSLN but were unmasked by the lack of an action potential when stimulated. This finding suggests that visual identification of the EBSLN without EMG confirmation may likely be flawed. Nerve stimulation technique has a substantial advantage in identifying all nerve types, including Cernea type 1, which is found at a higher position and sometimes is crowded under the laryngeal head of the sternothyroid muscle, as well as descending types 2A and 2B, which are most vulnerable to surgical manipulation injury.

SUMMARY

1. The age distribution revealed a diverse range, with the highest percentages in the 21-30 and 31-40 age groups. The mean age was 48.25 years, ranging from 22 to 80 years. Females comprised 75% of the case.
2. Benign thyroid diseases, particularly colloid goitre, were predominant, representing 61.67% of cases. Carcinoma accounted for 13.33%, with follicular adenoma and multinodular goitre also identified.
3. Left Hemithyroidectomy was the most common surgery performed, followed closely by Right Hemithyroidectomy. Total Hemithyroidectomy constituted a significant portion of surgeries.
4. FNAC results predominantly fell under Category 2 (benign), comprising 73.33% of cases, indicating a prevalence of benign conditions in the sample.
5. The distribution of EBSLN varied, with differing percentages across categories for left and right EBSLN with type 1 being the most common type.
6. Voice quality significantly improved over time post-operation, with 90% reporting good voice on day 1, increasing to 96.67% at 1 month, and reaching 100% at 3 months. Laryngoscopy on day 1 revealed mostly normal findings.

CONCLUSION

1. Type 1 was the commonest type in our study as per Cernia classification.
2. Deep knowledge of the surgical anatomy of the region of the superior thyroid pole and the EBSLN is of utmost importance. Careful dissection in the area of the superior pole of the thyroid gland and individual exposure and independent ligation of the branches of the superior thyroid artery very close to the capsule of the upper thyroid pole are essential to avoid EBSLN injury.
3. Exploration and identification of EBSLN may be helpful in preservation of nerve.

Limitations

Small sample size hence findings cannot be generalized.

ANNEXURE VI MASTER CHART

SR.NO	NAME	UIN	AGE	SEX	USG/CECT	FNAC(BETHESDA CATEGORY)	TFT	DIAGNOSIS	SURGERY	LT EBSLN	RT EBSLN	HPE	VOICE D1	DL SCOPY D1	VOICE 1MNT	VOICE 3MNTS
1	SUDHA CHAVAN	[illegible]	79	M	RIGHT COLLOID CYST	2	NORMAL	LEFT NODULAR GOITER	LEFT HEMITHYROIDECTOMY	2A		ANAPLASTIC CA	GOOD	NORMAL	GOOD	GOOD
2	SAKHUBAI PHULE	[illegible]	78	F	COLLOID GOITER	2	NORMAL	LEFT NODULAR GOITER	LEFT HEMITHYROIDECTOMY	2B		COLLOID NODULE	GOOD	NORMAL	GOOD	GOOD
3	SUNITA RAUT	[illegible]	49	F	COLLOID NODULE	2	NORMAL	RIGHT NODULAR GOITER	RIGHT HEMITHYROIDECTOMY		1	COLLOID NODULE	GOOD	NORMAL	GOOD	GOOD
4	SHAISTA PRAVIN	[illegible]	34	F	THYROIDITIS	2	NORMAL	MNG	TOTAL	2B	2B	NODULAR GOITER	GOOD	NORMAL	GOOD	GOOD
5	PRATIBHA DATTARAY	[illegible]	30	F	COLLOID GOITER	2	NORMAL	RIGHT COLLOID GOITER	RIGHT HEMITHYROIDECTOMY		2A	COLLOID NODULE	GOOD	NORMAL	GOOD	GOOD
6	ZOHRA HUSAIN	[illegible]	57	F	MNG WITH RETROSTERNAL	2	NORMAL	MULTINODULAR GOITER	TOTAL		1	MNG	GOOD	NORMAL	GOOD	GOOD
7	NILUBAI TRIYMBAK	[illegible]	51	F	FOLLICULAR ADENOMA	2	NORMAL	FOLLICULAR ADENOMA	LEFT HEMITHYROIDECTOMY	1		FOLLICULAR ADENOMA	GOOD	NORMAL	GOOD	GOOD
8	LAXMI HIWALE	[illegible]	40	F	GOITER WITH CYST	1	NORMAL	COLLOID CYST	TOTAL	1	1	COLLOID NODULE	GOOD	NORMAL	GOOD	GOOD
9	RUSHI NEHE	[illegible]	22	F	MNG	3	NORMAL	MNG	TOTAL	2A	2A	MEDULLARY CARCINOMA	HOARSE	NORMAL	GOOD	GOOD
10	AYAZ SHAIKH	[illegible]	62	M	TIRADS 4	4	NORMAL	RIGHT THYROID SWELLING	RIGHT HEMITHYROIDECTOMY		1	COLLOID GOITRE	GOOD	NORMAL	GOOD	GOOD
11	INDRABAI GUJAR	[illegible]	62	F	MNG	2	NORMAL	RETROSTERNAL GOITER	TOTAL	1	1	PAPILLARY VARIANT OF FOLLICULAR CA	GOOD	NORMAL	GOOD	GOOD
12	RUKHAMINBAI	[illegible]	78	F	BENIGN THYROID NODULE	3	NORMAL	RIGHT THYROID NODULE	RIGHT HEMITHYROIDECTOMY		2B	FOLLICULAR ADENOMA	GOOD	NORMAL	GOOD	GOOD
13	USHABAI BALU	[illegible]	37	F	LEFT THYROID NODULE	2	NORMAL	LEFT THYROID NODULE	LEFT HEMITHYROIDECTOMY	1		COLLOID NODULE	GOOD	NORMAL	GOOD	GOOD
14	YASHODABAI ROMA	[illegible]	69	F	BENIGN THYROID NODULE	2	NORMAL	LEFT THYROID NODULE	LEFT HEMITHYROIDECTOMY	2A		FOLLICULAR ADENOMA	HOARSE	NORMAL	GOOD	GOOD
15	ASHA RAUT	[illegible]	50	F	MNG	2	NORMAL	MNG	LEFT HEMITHYROIDECTOMY	2B		MNG WITH FOLLICULAR ADENOMA	GOOD	NORMAL	GOOD	GOOD
16	SHAIKH SAGAR	[illegible]	26	M	RIGHT CYSTIC NODULE	2	NORMAL	RIGHT THYROID NODULE	RIGHT HEMITHYROIDECTOMY		1	FOLLICULAR ADENOMA	GOOD	NORMAL	GOOD	GOOD
17	JYOTI DINESH	[illegible]	39	F	RIGHT COLLOID NODULE	1	NORMAL	RIGHT COLLOID NODULE	RIGHT HEMITHYROIDECTOMY		1	COLLOID GOITRE	GOOD	NORMAL	GOOD	GOOD
18	SANABEGUM SYED	[illegible]	26	F	RIGHT SOLID CYSTIC LESION	2	NORMAL	RIGHT CYSTIC NODULE	RIGHT HEMITHYROIDECTOMY		2A	MNG	GOOD	NORMAL	GOOD	GOOD

19	ARCHANA SUNIL	[illegible]	30	F	RIGHT COLLOID NODULE	2	NORMAL	RIGHT COLLOID NODULE	RIGHT HEMITHYROIDECTOMY		1	COLLOID GOITER	GOOD	NORMAL	GOOD	GOOD
20	VIJAYA PATIL	[illegible]	57	F	THYROIDITIS	2	NORMAL	THYROIDITIS	TOTAL			RIEDELS THYROIDITIS	HOARSE	B/L PALSY	HORSE	GOOD
21	NANDAGAJANAN	[illegible]	25	F	TIRADS 5	5	NORMAL	RIGHT THYROID SWELLING	RIGHT HEMITHYROIDECTOMY		2A	FOLLICULAR ADENOMA	GOOD	NORMAL	GOOD	GOOD
22	MOHD BABU	[illegible]	25	M	FOLLICULAR ADENOMA	2	NORMAL	LEFT THYROID NODULE	LEFT HEMITHYROIDECTOMY	1		FOLLICULAR CARCINOMA	HOARSE	NORMAL	GOOD	GOOD
23	LAXMIBAI AMBADAS	[illegible]	77	F	RIGHT COLLOID CYST	1	NORMAL	RIGHT COLLOID CYST	RIGHT HEMITHYROIDECTOMY		2B	COLLOID GOITER WITH CYSTIC DEGENERATION	GOOD	NORMAL	GOOD	GOOD
24	SURBHA RAOSAHEB	[illegible]	60	F	MNG WITH COLLOID CYST	2	NORMAL	BENIGN THYROID NODULE	TOTAL			MNG	GOOD	NORMAL	GOOD	GOOD
25	BHAUSAHEB SAVAI	[illegible]	73	M	LEFT COLLOID NODULE	1	NORMAL	COLLOID GOITER	LEFT HEMITHYROIDECTOMY	1		COLLOID NODULE	GOOD	NORMAL	GOOD	GOOD
26	SIDDHARTH G.	[illegible]	39	M	LEFT COLLOID NODULE	2	NORMAL	LEFT COLLOID NODULE	LEFT HEMITHYROIDECTOMY	1		COLLOID NODULAR GOITER	GOOD	NORMAL	GOOD	GOOD
27	SHANKAR NAMDEV	[illegible]	70	M	RIGHT COLLOID GOITER	2	NORMAL	RIGHT COLLOID GOITER	RIGHT HEMITHYROIDECTOMY		1	COLLOID NODULE	GOOD	NORMAL	GOOD	GOOD
28	NAJRA BEGUM	[illegible]	75	F	LEFT COLLOID GOITER	2	NORMAL	LEFT COLLOID NODULE	LEFT HEMITHYROIDECTOMY	2A		COLLOID GOITER	GOOD	NORMAL	GOOD	GOOD
29	MANOJ PARDESHI	[illegible]	57	F	LEFT COLLOID NODULE	2	NORMAL	LEFT COLLOID GOITER	LEFT HEMITHYROIDECTOMY	1		COLLOID GOITER	GOOD	NORMAL	GOOD	GOOD
30	SUNITA BALAJI	[illegible]	27	F	RIGHT COLLOID CYST	2	NORMAL	RIGHT COLLOID CYST	RIGHT HEMITHYROIDECTOMY		2B	COLLOID CYST	GOOD	NORMAL	GOOD	GOOD
31	GAUTAM DEUJBA	[illegible]	61	M	LEFT THYROID NODULE	1	NORMAL	LEFT THYROID NODULE	LEFT HEMITHYROIDECTOMY	1		COLLOID NODULAR GOITER	GOOD	NORMAL	GOOD	GOOD
32	PARVATIBAI PAWAR	[illegible]	55	F	RIGHT COLLOID GOITER	1	NORMAL	BENIGN THYROID DISEASE	RIGHT HEMITHYROIDECTOMY		1	RIGHT COLLOID GOITER	GOOD	NORMAL	GOOD	GOOD
33	MANGAL SHAMAHER	[illegible]	44	F	THYROIDITIS WITH MNG	2	NORMAL	THYROIDITIS WITH MNG	TOTAL	2A	2A	MNG	GOOD	NORMAL	GOOD	GOOD
34	SURAIYABI SHAIKH	[illegible]	40	F	FOLLICULAR CARCINOMA	3	NORMAL	FOLLICULAR CARCINOMA	TOTAL	1	1	FOLLICULAR CARCINOMA WITH THYROIDITIS	GOOD	NORMAL	GOOD	GOOD
35	SHAMA B SHAIKH	[illegible]	55	F	COLLOID NODULE WITH MNG	2	NORMAL	MNG	TOTAL	1	1	MNG	GOOD	NORMAL	GOOD	GOOD
36	SAKHUBAI PRAKASH	[illegible]	61	F	MULTIPLE NODULES B/L	4	NORMAL	B/L FOLLICULAR NEOPLASM	TOTAL	2B	2B	FOLLICULAR CA	GOOD	NORMAL	GOOD	GOOD
37	SHASHI KALARAUT	[illegible]	43	F	RIGHT COLLOID CYST	2	NORMAL	RIGHT COLLOID GOITER	RIGHT HEMITHYROIDECTOMY		1	COLLOID GOITER	GOOD	NORMAL	GOOD	GOOD
38	NIVRUTI KHOSRE	[illegible]	61	M	THYROID NODULE	2	NORMAL	BENIGN THYROID NODULE	RIGHT HEMITHYROIDECTOMY		2A	COLLOID GOITER	GOOD	NORMAL	GOOD	GOOD
39	SALUBAI PAWAR	[illegible]	50	F	LEFT THYROID NODULE	2	NORMAL	LEFT THYROID NODULE	LEFT HEMITHYROIDECTOMY	1		COLLOID NODULE	GOOD	NORMAL	GOOD	GOOD
40	BHARAT ATAMRAM	[illegible]	27	M	FOLLICULAR ADENOMA	2	NORMAL	RIGHT FOLLICULAR ADENOMA	RIGHT HEMITHYROIDECTOMY		2B	FOLLICULAR ADENOMA	GOOD	NORMAL	GOOD	GOOD
41	SURESH RAM	[illegible]	54	M	LEFT COLLOID NODULE	2	NORMAL	LEFT COLLOID NODULE	LEFT HEMITHYROIDECTOMY	1		LEFT COLLOID GOITER	GOOD	NORMAL	GOOD	GOOD
42	MINABAI TAWAR	[illegible]	55	F	LEFT SOLID CYSTIC NODULE	2	NORMAL	LEFT FOLLICULAR ADENOMA	LEFT HEMITHYROIDECTOMY	1		FOLLICULAR ADENOMA	GOOD	NORMAL	GOOD	GOOD
43	SWATI GANESH	[illegible]	26	F	NODULAR THYROIDITIS	2	NORMAL	RIGHT THYROID DISEASE	RIGHT HEMITHYROIDECTOMY		2A	RIEDELS THYROIDITIS	GOOD	NORMAL	GOOD	GOOD
44	NASRIN SHAIKH	[illegible]	27	F	LEFT SOLID CYSTIC NODULE	2	NORMAL	LEFT THYROID NODULE	LEFT HEMITHYROIDECTOMY	1		COLLOID CYST	GOOD	NORMAL	GOOD	GOOD
45	ARCHANA VISHNU	[illegible]	22	F	FOLLICULAR ADENOMA	3	NORMAL	RIGHT FOLLICULAR ADENOMA	RIGHT HEMITHYROIDECTOMY		1	FOLLICULAR CARCINOMA	GOOD	NORMAL	GOOD	GOOD
46	SAVITRABAI BHAGAT	[illegible]	60	F	MNG	2	NORMAL	MNG	TOTAL	2A	2A	MNG	GOOD	NORMAL	GOOD	GOOD
47	HARISHCHANDRA KATHAR	[illegible]	77	M	RIGHT COLLOID CYST	1	NORMAL	COLLOID CYST	RIGHT HEMITHYROIDECTOMY		1	COLLOID CYST	GOOD	NORMAL	GOOD	GOOD
48	MEENAKSHI DARSHIT	[illegible]	46	F	THYROID NODULE	2	NORMAL	BENIGN THYROID NODULE	LEFT HEMITHYROIDECTOMY	1		COLLOID GOITER	GOOD	NORMAL	GOOD	GOOD
49	MANKARNA NARAYAN	[illegible]	55	F	MNG	2	NORMAL	MNG	TOTAL	2B	2B	MNG	GOOD	NORMAL	GOOD	GOOD
50	ASHOK MADHAVRAO	[illegible]	72	M	LEFT NODULAR GOITER	2	NORMAL	LEFT NODULAR GOITER	LEFT HEMITHYROIDECTOMY	2A		NODULAR GOITER WITH CYSTIC CHANGES	GOOD	NORMAL	GOOD	GOOD
51	SRAVANTHI NARASAPURE	[illegible]	22	F	RIGHT COLLOID GOITER	2	NORMAL	RIGHT COLLOID GOITER	RIGHT HEMITHYROIDECTOMY		1	RIGHT COLLOID GOITER	GOOD	NORMAL	GOOD	GOOD
52	SHAISTA ALI	[illegible]	34	F	MNG	2	NORMAL	MNG	TOTAL	1	1	MNG	GOOD	NORMAL	GOOD	GOOD
53	SANGITABAI MOKASE	[illegible]	27	F	FOLLICULAR ADENOMA	2	NORMAL	LEFT FOLLICULAR ADENOMA	LEFT HEMITHYROIDECTOMY	2B		FOLLICULAR ADENOMA	GOOD	NORMAL	GOOD	GOOD
54	MEHRAJ ALI AHEMADALI	[illegible]	26	M	RIGHT COLLOID GOITER	2	NORMAL	RIGHT COLLOID GOITER	RIGHT HEMITHYROIDECTOMY		1	COLLOID GOITER	GOOD	NORMAL	GOOD	GOOD
55	PRAVIN BHAT	[illegible]	36	M	RIGHT PAPILLARY CA	4	NORMAL	RIGHT PAPILLARY CA	TOTAL	1	1	PAPILLARY CA	HOARSE	LEFT PALSY	HOARSE	GOOD
56	MAYA SHAKARG	[illegible]	26	F	LEFT COLLOID CYST	2	NORMAL	LEFT COLLOID CYST	LEFT HEMITHYROIDECTOMY	2A		COLLOID GOITER	GOOD	NORMAL	GOOD	GOOD
57	PANDHARULA NAGTILAK	[illegible]	70	F	MNG	2	NORMAL	MNG	TOTAL	1	1	MNG	HOARSE	NORMAL	GOOD	GOOD
58	ALKA SHELKE	[illegible]	31	F	LEFT COLLOID GOITER	1	NORMAL	LEFT COLLOID GOITER	LEFT HEMITHYROIDECTOMY	1		COLLOID GOITER	GOOD	NORMAL	GOOD	GOOD
59	JAISHRI TATERAO	[illegible]	27	F	THYROIDITIS	2	NORMAL	THYROIDITIS	TOTAL	1	1	RIEDELS THYROIDITIS	GOOD OO	NORMAL	GOOD	GOOD
60	SUNITA RAUTRAM	[illegible]	27	F	LEFT COLLOID CYST	2	NORMAL	LEFT COLLOID CYST	LEFT HEMITHYROIDECTOMY	2A		COLLOID CYST	GOOD	NORMAL	GOOD	GOOD

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