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Original Research Article

A study on the recurrent laryngeal nerve injuries in thyroid surgeries at PESIMSR, Kuppam

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ABSTRACT

Background: Thyroid surgeries are routinely performed by general surgeons all over India. Although the incidence of recurrent laryngeal nerve (RLN) injury is uncommon, it still carries a significant impact on patient's quality of life post operatively. Hence this study was done to identify and discuss incidence and various factors involved in RLN injury.
Methods: This is a prospective observational study carried out at a rural health care setup at PES Institute of Medical Sciences and Research (PESIMSR), Kuppam. A total of 60 patients who qualified the inclusion and exclusion criteria were studied from December 2016 to June 2018. All the patient data including relevant history, clinical findings, intra operative findings and post-operative follow up were recorded and the results were tabulated. Institutional ethics committee clearance was obtained before the start of the study.
Results: Out of 60 patients 51 were females and 9 were males. 30 patients had unilateral involvement and the other 30 patients had bilateral involvement of thyroid lobes on clinical and ultrasound examination. On fine needle aspiration cytology (FNAC), 57 were benign, 2 were malignant and 1 was Hashimoto's thyroiditis. Surgeries were done according to standard protocol. Intra operatively RLN was identified in 56 patients. In 3 of them there was a structural anomaly. Postoperative hoarseness of voice was seen in 8 patients, however long term vocal cord palsy was seen in 3 patients.
Conclusions: This study shows the importance of intra-operative nerve identification, incidence of RLN injury and role of postoperative rehabilitation.

Keywords: Intra-operative nerve identification, Multinodular goitre, RLN injuries, Vocal cord palsy

INTRODUCTION

Thyroid surgery has always been and will always be the most common endocrine surgical operation.[1] An accurately performed surgery on the thyroid gland requires both experience and technical ability. The thyroid surgery is considered by many to be at the zenith of endocrine operations; the surgeon who performs a good thyroidectomy can, with little additional training, handle most of the other operations within this field, because the technique required is much the same.[2] Today most of the complications of thyroid and parathyroid surgery are related to either metabolic derangements or injury to the recurrent laryngeal nerves. This is mainly due to anatomical variations in the course of recurrent laryngeal nerve and positions of parathyroids.[3-11] Other complications include injury to superior laryngeal nerve (SLN), infection, airway compromise, bleeding and rarely thyroid storm.

Complications concerning the RLN cause considerable morbidity and occur in 0% to 5% of the patients.[12]

Patients who develop complications such as permanent hypocalcaemia and recurrent laryngeal nerve injury have a decreased quality of life and increased cost of healthcare and often require lifelong replacement therapy with thyroxin or further surgical surgeries and rehabilitation.[13]

This study was planned to assess the incidence of various postoperative complications following different thyroid surgeries and the role of adequate preoperative patient preparation, careful, meticulous surgical technique and early recognition of postoperative complications with the prompt institution of treatment in reducing morbidity and providing the patient with the best chance of a satisfactory outcome. The aim of the present study was to evaluate the recurrent laryngeal nerve injuries in patients undergoing thyroid surgeries at PESIMSR.

METHODS

The present study includes patients admitted and treated in the Department of General Surgery at PESIMSR, Kuppam, Andhra Pradesh, India from December 2016 to June 2018.

All patients who underwent thyroid surgery in PESIMSR and were willing to participate in the study during the study period were included. Those not on regular follow up, with history of prior neck surgeries/neck irradiation and with pre op impaired vocal cord function on indirect laryngoscope were excluded from the study.

The details of clinical history were recorded; patients were monitored from the time of admission, up till the time of discharge from the hospital and were later followed up in OPD at 1 month after discharge. Those cases with complications were further followed up to 6 months at an interval of 2 months.

All the data gathered was tabulated and results assessed using SPSS software. Institutional committee approval and written informed consent were obtained for all cases.

RESULTS

The total numbers of cases included in this study were 60. The youngest age in the present series was 16 years and the oldest was 67 years (Figure 1). The peak age group of individuals undergoing thyroid surgery was between 21 and 50 years accounting for 83.3% of patients. The mean age was 36.06 years. Male patients were 9 and female patients were 51 (Figure 2).

Majority of patients (32 patients; 53.33%) had thyroid swellings with sizes ranging between 2-5 cm. Only 11 patients had thyroid swellings less than 2 cm in size.

Fifty percent (30 patients) had diffuse enlargement of thyroid gland, where as 20% of patients (12) had enlargement of left lobe and 30% of patients (18) had enlargement of right lobe. Three patients (5%) had clinically palpable lymph nodes (Figure 3).

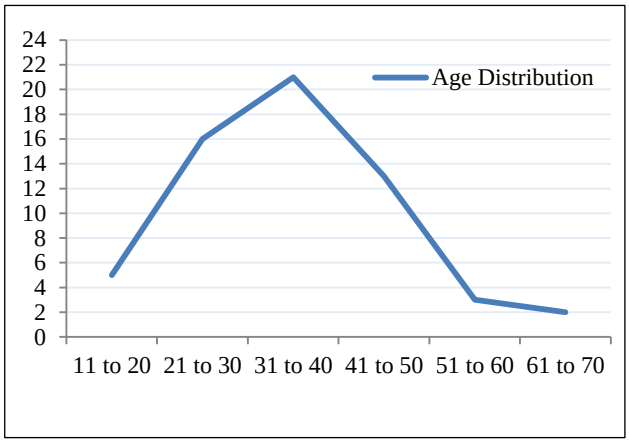

Figure 1: Age distribution.

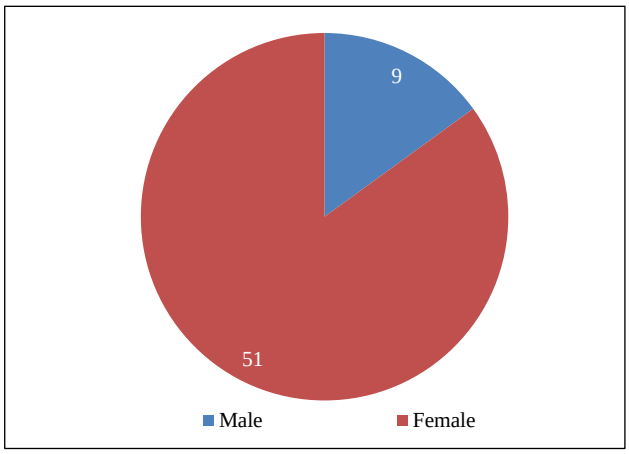

Figure 2: Sex distribution.

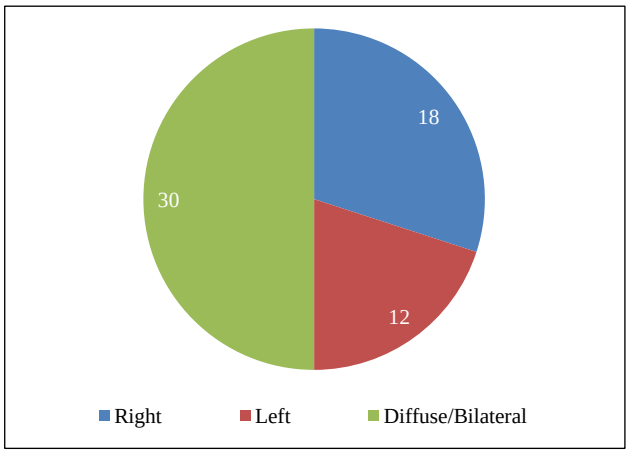

Figure 3: Distribution of involvement of lesions in thyroid gland.

Intra-operatively recurrent laryngeal nerve was identified in 56 patients (93.3%) of which RLN anomaly were seen in 3 patients (5%). RLN was not identified in 4 patients

(6.67%) and anomalies in these patients were not known (Table 1).

Post-operative hoarseness of voice was seen in 8 patients (13.33%). Post-operative Indirect Laryngoscopy (IDL) showed cord position which was median in 3(5%) patients and para-median in case of 57(95%) patients. Recurrent laryngeal nerve palsy was identified in 3(5%) patients post-operatively and all were transient (5%) and unilateral (right side in two cases) (Figure 4).

Table 1: Recurrent laryngeal nerve course intra-operatively.

Recurrent laryngeal nerve		Total	RLN anamoly			Total
Identified	**Not identified**		**Yes**	**No**	**Not known**	
56	4	60	3	53	4	60
93.3	6.67	100	5	88.33	6.67	100

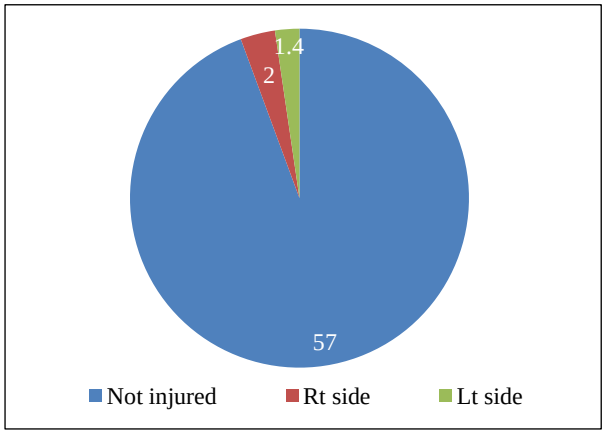

Figure 4: RLN injury in present study.

DISCUSSION

The thyroid gland being located in neck is related to many important vital structures such as carotid vessels, jugular veins, RLN, SLN, trachea, esophagus and thoracic duct, hence surgery on thyroid gland is a test to the dexterity, skill and finesse of any surgeon. The incidence of postoperative transient RLN palsy varies from 0.9 to 17% in various study groups (Table 2). The incidence of present study is 5% which is comparable to a study by Chiang et al (5.1%).[14]

Postoperatively 8 patients had hoarseness of voice in which 3 were with abnormal vocal cord position and all of them were treated with nebulisation as per standard protocol. 5 patients regained their voice within 24 hours and 3 patients with abnormal vocal cords position had persistent hoarseness of voice. Postoperative IDL in the above 3 patients showed vocal cords in median position (right side 2 patients and left 1). All the 3 patients were treated with steroids and neurotrophic vitamins.[15] After 2 months these 3 patients regained normal voice repeat IDL showed normal position of vocal cords. Risk factors for RLN injury:[16,17]

- More extended thyroid resections,
- In patients with malignant thyroid disease,
- In patients in whom the recurrent laryngeal nerves could not be identified,
- In re-operations due to recurrent thyroid disease.

At present, there are mainly three strategies that can reduce the risk of RLN injury.[18]

Table 2: Comparison of RLN palsy with other studies.

Author	Year	No. of cases	RLN PALSY	
			Transient (%)	**Permanent (%)**
Bora et al[4]	1999	142	2.1	0
Thompson et al[5]	1973	411	-	0.7
Netterville et al[6]	1990	2110	-	0.7
Sancho et al[7]	2004-06	188	17	0.5
Hermann et al[8]	1991	7566	2.9	0.5
Hermann et al[9]	2002	294	2	0.7
Goncalves et al[10]	1996-2000	1020	1.4	0.4
Steurer et al[11]	2002	1080	3.4	0.3
Chiang et al[2]	2005	521	5.1	0.9
Rosato et al[12]	2004	14,934	2	1
Present study	2016-18	60	5	-

The first and most frequently used method is visual control by complete dissection of the full extra-laryngeal trajectory of the recurrent laryngeal nerve.

Intra-operative electrical nerve stimulation of the surgical field in addition to visual control can be used to delineate the presence, function, and possibly the course of the

recurrent laryngeal nerves by observing contractions of the crico-pharyngeus muscle.

Uninterrupted monitoring of laryngeal electro-myographic activity through electrodes placed against the posterior crico-arytenoid muscles can be used. It reveals changes in mechanical activation by manipulation of the recurrent laryngeal nerves during dissection.

Either way, detailed knowledge of the anatomy is of paramount importance to avoid damage to the recurrent laryngeal nerve.

Postoperative hoarseness may be caused by several mechanisms. If it occurs in the first 2 to 5 days postoperatively, it is most likely caused by edema in the operating field as a self-limited, innocent process. Long-term hoarseness (<6 months) may occur if the recurrent nerve has been kept intact, whereas stretching it too forcefully has damaged its axons.

In the case of bilateral vocal cord paralysis, initial treatment involves obtaining an adequate airway. If endotracheal intubation is not possible, an emergency tracheostomy may be required. If the surgeon is certain the recurrent laryngeal nerves are both well preserved, a trial of extubation after several days can be performed. One should extubate in a controlled setting as a re-intubation might be required. Intravenous steroids may be beneficial at times. If nerve function has not recovered after the second extubation trial, tracheotomy is certainly warranted.

CONCLUSION

A surgeon should have a sound knowledge about the RLN anatomy, it's variations as well as it's anomalies as a RLN palsy can carry a significant morbidity and has a significant impact on patient's quality of life. Careful identification of RLN during surgery will prevent its injury and close post op monitoring will help in managing the complications which ensures a better outcome.

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