

## NON RECUERRENT LARYNGEAL NERVE: A CASE REPORT

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### Abstract

Identification and preservation of recurrent laryngeal nerve (Inferior laryngeal nerve) is one of the most important step during Thyroid and Parathyroid surgery. Very rarely, Thyroid surgeons may encounter a Non recurrent laryngeal nerve. A preoperative clinical suspicion, in case of an aberrant subclavian artery or situs inversus and a systematic meticulous dissection will help in the identification and preservation of a non recurrent laryngeal nerve. We report a case of 62 year old male with Papillary carcinoma thyroid having an aberrant right Subclavian artery and a Non recurrent Inferior laryngeal nerve.

### Introduction

The identification and preservation of recurrent laryngeal nerve is important during Thyroid and Parathyroid surgery as injury to Recurrent laryngeal nerve on one side can lead to hoarseness and bilateral injury can lead to severe respiratory distress and strider. The recurrent laryngeal nerve anomalies makes it difficult to identify during surgery. A Non recurrent laryngeal nerve is highly vulnerable to injury during surgery. The recurrent laryngeal nerve supplies all extrinsic muscles of the larynx except cricothyroid muscle. These muscles controls the laryngeal movements involved in phonation, breathing and swallowing. Preoperative diagnosis of Non recurrent laryngeal nerve is difficult. A right NRLN is suspected when radiological evaluation shows an aberrant right subclavian artery. A left NRLN is suspected in case of situs inversus. The incidence n RLN on right side is 0.5-0.7 % and on left side is 0.1-0.3 %<sup>1-6</sup>.

### Case report

A 62 year old male presented with a gradually progressive swelling on anterior aspect of neck of three year duration. He was a hypertensive and was on medication for two years<sup>3</sup>. On examination, there was a 4x5 cm firm swelling involving right lobe of the thyroid gland. No significant lymphnodes were palpable. Indirect laryngoscopic examination showed bilateral mobile vocal cords. He was evaluated and Fine Needle Aspiration Cytology was suggestive of Papillary carcinoma Thyroid. CT evaluation showed a heterogeneously enhancing mass with specks of calcification arising from the right lobe of the thyroid gland and 2x1 cm lymph node on right side of the neck. An aberrant right subclavian artery going posterior to the oesophagus was seen in the imaging. Total Thyroidectomy with central compartment clearance and a right side selective neck dissection was done. Right recurrent laryngeal nerve was not found in its usual site. Instead a type 11A Non recurrent laryngeal nerve was found running transversely from carotid sheath towards larynx. It was identified and preserved. Left recurrent laryngeal nerve was present in tracheoesophageal groove and was preserved.



Figure 1: Intra operative picture of NRLN on right side

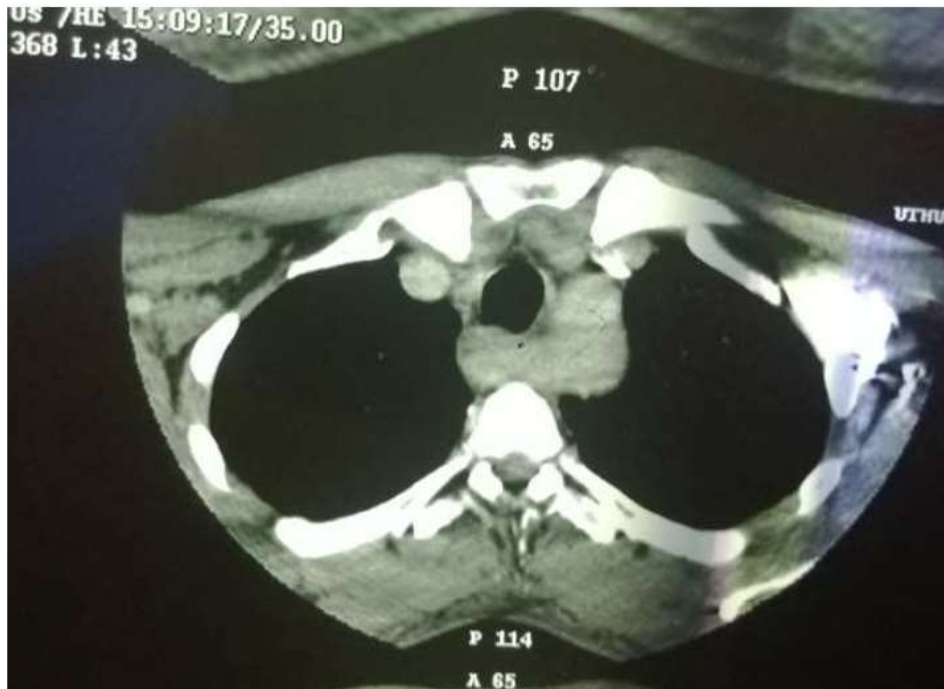


Figure 2: CT scan image showing aberrant right subclavian artery

## Discussion

In 1823, Stedman reported Non recurrent laryngeal nerve on right side while he was doing cadaveric dissection at Royal Academy, Copenhagen<sup>7</sup>. The surgical importance of NRLN was pointed out by Pemberton and Benner in 1932<sup>8</sup>. First case was aberrant right subclavian artery by Hunwald in 1785. Bayford reported first retroesophageal right subclavian artery in a patient with dysphagia in 1974<sup>9</sup>. The right NRLN is a result of abnormal origin of right

subclavian artery from arch of Aorta. The right and left RLN supply the sixth branchial arch in the embryological stage of life. As the embryo elongates and heart descends, the distal part of sixth arch disappears on right side and the RLN ascends up and winds around the right subclavian artery on its upward course towards larynx. But on left side, the sixth arch remains as Ductus arteriosus until birth and as ligamentum arteriosum later. So the left RLN winds around the ligamentum arteriosum and hence it is more longer than right RLN<sup>10,11</sup>.

When right subclavian artery arises from the arch of Aorta as fourth branch, it passes either between trachea and oesophagus or posterior to the oesophagus. In such cases, the right inferior laryngeal nerve passes directly downward and medially from the vagal trunk to the larynx at the level of thyroid gland<sup>10,11</sup>.

### Three types of NRLN have been described:

TYPE I: NRLN arises from the Vagus and runs together with the superior thyroid vessels

TYPE IIA: NRLN follows a transverse path parallel to and over the trunk of inferior thyroid artery.

TYPE IIB : NRLN follows a transverse path parallel to and under the trunk or between the branches of inferior thyroid artery<sup>12</sup>.

An aberrant right subclavian artery on radiological evaluation leads surgeons to be cautious and look for NRLN. A systematic meticulous dissection of any transversely running structure between carotid sheath and thyrohyoid membrane helps to avoid NRLN injury during surgery.

### Conclusion

Although Non recurrent laryngeal nerve is very rare, overlooking the low incidence may lead to a permanent damage to it. A proper preoperative evaluation and meticulous dissection with sound anatomical knowledge can prevent injury to NRLN during Thyroid surgery.

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