

Nonrecurrent Laryngeal Nerve: An Indian Documentation

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ABSTRACT

Purpose of the study: Aimed to highlight a rare anatomical variation of right recurrent laryngeal nerve and a brief review of literature.

Nonrecurrent laryngeal nerve is a rare anatomical variation with an incidence of 0.5 to 0.7% in thyroid surgery. It is difficult to identify this variation preoperatively either by imaging or by signs and symptoms, unless a vascular anomaly is suspected.

This study aims to underline the necessity of recognizing the possibility of non-RLN and also to follow a systematic dissection of recurrent laryngeal nerve during thyroid surgeries, to prevent intraoperative nerve damage.

Keywords: Recurrent laryngeal nerve, Thyroidectomy, Aberrant subclavian artery.

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INTRODUCTION

Identification and preservation of recurrent laryngeal nerve is of paramount importance in thyroid surgery. While the position of left recurrent laryngeal nerve (RLN) is more or less constant, one can encounter a nonrecurrent laryngeal nerve (NRLN) on the right in about (0.5-0.7%) of cases.¹ However, in spite of its association with congenital vascular anomalies, short of extensive preoperative imaging, it is impossible to identify a NRLN.

Therefore, it is imperative that we have a standard surgical practice to identify RLN. This will prevent an inadvertent damage to an eventual NRLN. Here, we report one such case of a right NRLN and a brief review of literature.

CASE REPORT

A 35-year-old woman presented to our department with complaints of right sided thyroid nodule and multiple cervical lymph node swelling on the same side. She had no complaints of dysphagia. Fine needle aspiration cytology was consistent with cystic papillary carcinoma thyroid. She underwent total thyroidectomy with right modified radical neck dissection. During surgery, the fascia between common carotid artery and thyroid gland was separated using blunt

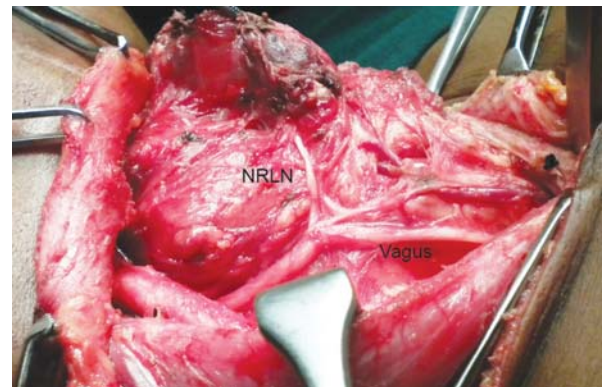
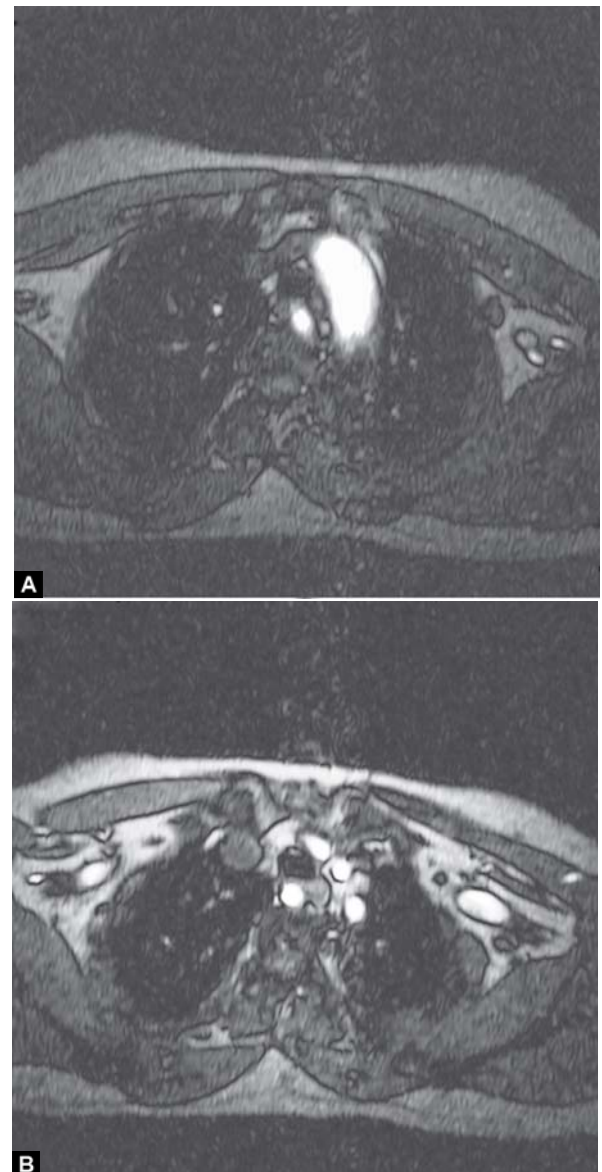


Fig. 1: Type 1B right NRLN arising directly from vagus



Figs 2A and B: MR angiography, showing right aberrant subclavian artery, arising as the fourth branch of aorta and traversing retroesophageal

dissection. The right RLN was not found as expected. We then traced the vagus nerve superiorly. At the level of the isthmus, a type 1B NRLN (Fig. 1) was seen coursing horizontally from cervical trunk of vagus nerve. The left RLN had a normal course. Vocal cord functions were normal after surgery. Postoperative MRA showed a right aberrant subclavian artery, having a direct origin from anteromedial aortic arch and running retroesophageal (Figs 2A and B).

DISCUSSION

Brief History

A NRLN on the right side was first described by Stedman in 1823. In 1935, Berlin reported this anomaly on the left side.²

Incidence

Frequency of occurrence is variable, it is around 0.5 to 0.7%¹ in thyroid surgeries which may differ in general population.

Embryology

RLN is the nerve of the 6th branchial arch, with the descent of the heart the nerve passes beneath the 6th aortic arch and then ascends to the larynx. On the right side, distal portion of the 6th and 5th aortic arch disappears and the nerve moves beneath the 4th aortic arch which becomes the future subclavian artery. Occasionally, the 4th arch disappears and the subclavian arises directly from the aorta (aberrant subclavian artery) in such cases the nerve moves cranially and originates directly from the vagus, on the left side, it is usually associated with situs inversus or a right aortic arch.³

Three types of NRLN have been described as follows:

- *Type IA:* The nerve has a straight course at the level of superior thyroid pedicle.
- *Type IB:* (Most common) the nerve runs transversely at the level of isthmus.
- *Type II:* Nerve has a downward course and loops upwards before reaching trachea esophageal groove.¹

Diagnosis

The surgical importance of a NRLN is its vulnerability during thyroid surgery, no reliable symptoms and signs indicate the possibility of NRLN. An aberrant subclavian artery is almost always associated with NRLN, hence demonstration of such vascular anomaly by CT scan, MR angiography or digital subtraction angiography would be important to suspect a NRLN or even rarely, if the patient has complaints of dysphagia (dysphagia lusoria). In most of the cases reported, these tests were used retrospectively.¹

The RLN has several anatomical variations, hence identification and complete exposure of RLN is considered the safest approach for thyroid and parathyroid surgeries by most authors.⁴

We at our institution have developed the practice of opening the fascia between the carotid artery and thyroid gland using blunt dissection, with the exception of middle thyroid vein, all structures coursing transversely are preserved till the RLN is identified low down in the neck, which is then traced superiorly. Using this operative technique, we were able to identify a right NRLN in one such case.

CONCLUSION

Recurrent laryngeal nerve has several anatomical variations. Nonrecurrent laryngeal nerve is a rare anomaly, overlooking it can be catastrophic. A sound anatomical knowledge and systematic dissection of the RLN will help us to preserve its function during thyroid and parathyroid surgeries.

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