Case Report

Non-recurrent inferior laryngeal nerve: a case report

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ABSTRACT

The incidence of Non-recurrent laryngeal nerve (NRLN) is reported to be 0.6%-0.8% on the right side and in 0.004% on the left side. Damage to this nerve during thyroidectomy may lead to vocal cord complications and should therefore be prevented. A middle-aged woman with a nodular goiter who underwent subtotal thyroidectomy for multinodular colloid goiter. We encountered a non-recurrent laryngeal nerve on the right side in a patient during surgery. We were not able to find the inferior laryngeal nerve in its usual position using the customary anatomical landmarks. Instead, it was emerging directly from the right vagus nerve at a right angle and entering the larynx as a unique non-bifurcating nerve. Nonrecurrent inferior laryngeal nerve incidence is very rare, but when present, increases the risk of damage during thyroidectomy. Hence, it is very important to be aware of the anatomical variations of the inguinal lymph node (ILN) and the use of safe meticulous dissection while looking for the nerve during thyroidectomy. The use of Intra-operative neuro-monitoring (IONM) if available in thyroid surgery allows the surgeon to recognize and differentiate branches of the inferior laryngeal nerve (ILN) from sympathetic anastomoses, as well as NRLN during surgery.

Keywords: Intra-operative neuro-monitoring, Non-recurrent inferior laryngeal nerve

INTRODUCTION

The inferior laryngeal nerve is traditionally named recurrent due to the fact that it loops around the subclavian artery on the right side and the arch of aorta on the left side.¹ The inferior laryngeal nerve (ILN) innervates the intrinsic muscles of the larynx except the cricothyroid. It also innervates the mucosa of the laryngeal region inferior to the vocal cords. Being an essential structure to laryngeal functions, injury to this nerve may thus result in paralysis of the vocal cord on the same side leading to permanent hoarseness.² If the lesion is bilateral aphonia and life-threatening dyspnea may ensue as a result of medial placement of the paralytic vocal cords, which can obstruct the airway.² Given the intimate relation with the thyroid gland, ILN identification and preservation are vital steps in thyroid surgery. The non-recurrent laryngeal nerve (NRLN) is an anatomic variation and its intraoperative identification and preservation can be a challenge even for the most experienced surgeon. The non-recurrent ILN is related to the absence of brachiocephalic trunk and the presence of an anomaly called arteria lusoria on the right side.³ It only appears on the left side only if associated with situs inversus.⁴

CASE REPORT

A middle-aged woman presented with a nodule on the left lobe of thyroid to the department of general surgery. She was in euthyroid state and had no pressure symptoms. Clinical examination revealed a firm smooth nodule with size of 3 cm in diameter on the left lobe of thyroid.
Ultrasonography of neck showed multiple nodules involving both lobes of thyroid gland largest measuring 30×24×10 mm on the left lobe. Indirect laryngoscopy showed normal vocal cord movements. Fine needle aspiration cytology (FNAC) showed colloid goitre and she was posted for thyroidectomy. During surgery, the right recurrent laryngeal nerve (RLN) was not noted in the normal position. On further dissecting upwards it was seen emanating from the right vagus nerve almost at a right angle, entering the larynx 3 cm after its origin (Figure 1). The nerve did not show a recurrent course. The nerve on the left side had a normal configuration coming upwards in the tracheoesophageal groove in a recurrent fashion from the left vagus nerve. Patient had type 2A NRILN. Peri-operative period was uneventful and postoperative IDL was normal.

**DISCUSSION**

The reported incidence of NRLN on the right side is 0.6 to 0.8% and on the left side is 0.004%. ILN is the nerve of the 6th branchial arch which, with the descent of the heart loops around 6th aortic arch and ascends to the larynx in the tracheoesophageal groove. On the right side, normally the distal portion of the 6th and 5th aortic arches disappears and the nerve moves up beneath the 4th aortic arch (Figure 2), which becomes the future right subclavian artery. Occasionally, the 4th arch disappears, and the subclavian artery arises directly from the aorta distal to the origin of the left subclavian artery (aberrant subclavian artery or arteria lusoria), Figure 2 and 3.

In these cases, the nerve moves cranially and originates directly from the vagus and enters the larynx without forming a loop. Even though this vascular change is usually asymptomatic, about 5% of these patients report...
Nonrecurrent inferior laryngeal nerve incidence is very rare, but when present, increases the risk of damage during thyroidectomy. Hence, it is very important to be aware of the anatomical variations of the ILN and the use of diligent dissection while looking for the nerve during thyroidectomy. Preoperative radiological diagnosis of arteria lusoria or dysphagia lusoria may suggest its presence. The use of Intra-operative neuro-monitoring (IONM) if available in thyroid surgery allows the surgeon to recognize and differentiate branches of the ILN from sympathetic anastomoses, as well as NRLN during surgery.

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