6-2020

Non-recurrent laryngeal nerve: a case report and review of literature

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CASE REPORT

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Abstract

Right recurrent laryngeal nerve can take a "Non-Recurrent" course and can present as a Non Recurrent Laryngeal nerve which is a rare entity. Such anomalies can lead to difficulty in locating the laryngeal nerve during thyroid surgeries and there are higher chances of it being injured. Therefore, surgeons should be mindful of this entity. We report the case of a 53-year-old lady who underwent thyroid surgery and a right Non Recurrent Laryngeal Nerve was identified intra-operatively.

Keywords: Non-recurrent laryngeal nerve, Recurrent laryngeal nerve, Thyroidectomy.

DOI: https://doi.org/10.5455/JPMA.45424

Introduction

The one thing that is on top of a thyroid surgeon's mind during thyroidectomy is the Recurrent Laryngeal Nerve (RLN). The RLN originates from the Vagus nerve on both sides. On the right side it loops around the Subclavian artery and on the left side it loops around the Aorta to enter the neck on both sides of the trachea. Direct visualization of the RLN is considered imperative for its subsequent protection during thyroid surgery.[1] In 0.7% of the general population the right laryngeal nerve takes a 'Non-Recurrent' course and hence is known as the Non-Recurrent Laryngeal Nerve (NRLN).[2] Such anatomical anomalies can result in difficulty to locate the nerve during thyroid surgery. Therefore it is important for the thyroid surgeon to be mindful of such anatomical variations during surgery. We present one such case to emphasize the importance of this variation during thyroid surgery.

Case Report

A 53-year-old lady presented to the ENT clinic of Aga Khan University Hospital on March 2, 2019 with complaint of swelling on the of right side of the neck that was gradually increasing in size. She had noticed some change in her voice during the preceding one month. It was not associated with any pain or compressive symptoms.

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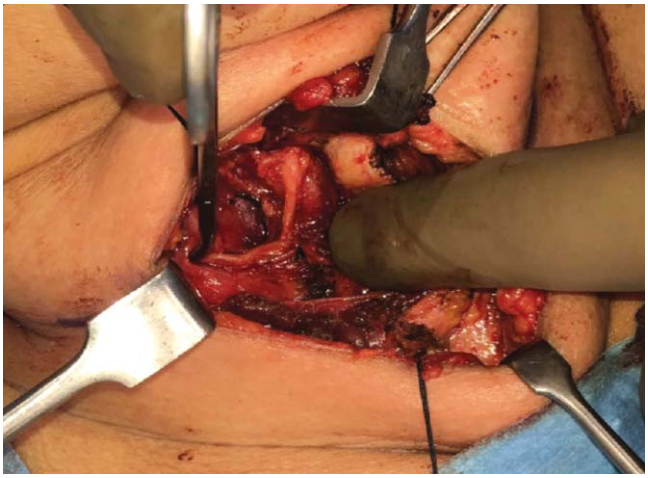

Figure-1: Right non-recurrent laryngeal nerve going to cricothyroid joint.

There were no signs or symptoms of hypo or hyperthyroidism. On examination a 2 x 3 cm swelling on the right side of the neck was revealed which was moving with deglutition. The patient was advised ultrasound. On ultrasound scan, a normal-sized thyroid gland with a small isoechoic to hypoechoic solid-looking nodule could be seen at the lower pole of the right lobe of the thyroid gland measuring 15.7 mm x7.1 mm in diameter. No calcification or increased vascularity was identified. Fine needle aspiration cytology (FNAC) was performed under ultrasound guidance and the nodule turned out to be Benign Follicular Nodule (Category II as per Bethesda's System of reporting Thyroid Cytopathology).[3]

The patient then underwent right thyroid lobectomy under general anaesthesia on March 12, 2019. Intraoperatively, after giving a skin crease incision and separating the strap muscles in midline, right thyroid lobe was identified. The superior pole was dissected and ligated close to the thyroid tissue. Middle thyroid veins were identified and ligated. Careful tissue dissection was done in the plane between the carotid sheath and the trachea on the right side to identify the recurrent laryngeal nerve (RLN). The RLN was not identified in its usual anatomical position. A nerve-like structure was identified entering the trachea at the level of cricothyroid joint (Figure-1). The structure was traced back and found to be arising from the Vagus nerve (Figure-2). We

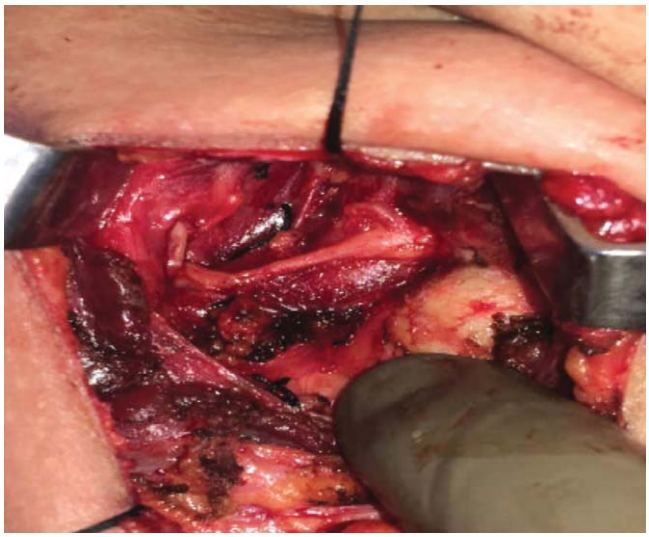

Figure-2: Right non-recurrent laryngeal nerve arising from right vagus nerve.

concluded that our patient had a 'Non-Recurrent Laryngeal Nerve'. Right thyroid lobectomy was completed. During the procedure right inferior parathyroid gland was identified and saved. A 12 Fr Redivac drain was placed and the wound was closed. Postoperatively her voice was fine and the patient tolerated her diet. On postoperative day one total output in the drain was 10ml/24 hours, therefore, the drain was removed and the patient was discharged.

Final histopathology showed Benign Nodular Hyperplasia with Lymphocytic Thyroiditis. The patient was seen after one week for follow-up. No complications were noted. As the patient was doing fine, no further follow-ups was required.

Discussion

NRLN was first reported by Stedman in 1823 during cadaveric dissection.[2] During the dissection he also found that the right subclavian artery was arising directly from the aortic arch on the left and passing posteriorly to the oesophagus to the right side.[4] This arterial anomaly is classically known as 'Arteria Lusoria'.[5]

Most of the patients with a NRLN have it on the right side, whereas a left NRLN is an extremely rare entity with a prevalence of 0.004%[6] and is mostly associated with situs inversus.[7] Five percent of these patients will present with dysphagia (dysphagia lusoria) due to the compression of the oesophagus by the aberrant Subclavian artery.[5]

Apart from causing dysphagia, it is important to keep this rare anatomical variation of the Subclavian artery in mind, especially during oesophageal surgeries, as it can lead to life-threatening vascular injuries.[6] This anomaly can also lead to ischaemia of the upper limb and about 5% of these patients will present with airway compression symptoms.[8] Prevalence of aberrant subclavian artery in right NRLNs is 89.3%.[2] Our patient did not show dysphagia lusoria or any other symptoms and therefore investigations to detect the vascular anomaly were not done.

Studies have shown that an undetected NRLN during surgery increases the risk of iatrogenic nerve injury by as much as six-fold.[9] Some authors have recommended the use of preoperative ultrasonography done by a member of the surgery team to detect the associated vascular anomaly and predict NRLN preoperatively to avoid injury. Preoperative ultrasonography has shown an accuracy of up to 98% in predicting NRLN.[10] Due to a lack of widespread expertise in surgeons for such ultrasonographic examinations such investigations might not be possible as preoperative workup in most settings. But at centres where such expertise exists, the role of preoperative ultrasound to predict NRLN should be further investigated.

Meticulous dissection should be done to locate and identify the recurrent laryngeal nerve. If it is not found in the usual location, NRLN should be suspected. No structure passing medially from the carotid sheath to the trachea should be ligated except the middle thyroid veins until the nerve has been identified.[4]

We are reporting this case to remind thyroid surgeons of this rare anatomical variation so that they may be vigilant while performing thyroidectomies.

Conclusion

We report a case of a 53 years old lady who underwent right thyroid lobectomy and a NRLN was encountered intraoperatively. It is a rare entity which should be kept in mind by surgeons while performing thyroid surgeries. Meticulous dissection helps to locate the RLN and if it is not found in the usual location one should suspect NRLN.

Disclaimer: This manuscript has not been previously presented or published in conference.

Conflict of Interest: This case report has no conflict of interest.

Funding Disclosure: No funding source was used in writing this manuscript.

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