

Post-thyroidectomy Transcutaneous Laryngeal Ultrasound Analysis of Vocal Cords by Endocrine Surgeons

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ABSTRACT

Recurrent laryngeal nerve (RLN) injury is one of the feared complications of thyroid surgery due to concerns in voice change with varying degrees of hoarseness and sometimes associated breathing difficulty depending on the extent of damage. Various precautions along with intraoperative adjuncts are being used in order to identify and preserve the function of RLNs during thyroid surgery. Pre-, intra- and postoperative monitoring of RLN is necessary for a safe thyroid surgery. Transcutaneous laryngeal ultrasound (TLUSG) is an excellent noninvasive tool for assessing the vocal cord function after thyroidectomy. Ultrasound examination of vocal cords can be used for comprehensive monitoring of RLN and enhancing postoperative care in thyroid surgery by endocrine surgeons. We discuss in this article how we perform ultrasound for postoperative evaluation of vocal cords.

Keywords: Endocrine, Endocrine surgery, Thyroidectomy.

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INTRODUCTION

Recurrent laryngeal nerve (RLN) injury is one of the feared complications of thyroid surgery due to concerns in voice change with varying degrees of hoarseness and sometimes associated breathing difficulty depending on the extent of damage. Various precautions along with intraoperative adjuncts are being used in order to identify and preserve the function of RLNs during thyroid surgery. Pre-, intra-, and postoperative monitoring of RLN is necessary for a safe thyroid surgery. Transcutaneous laryngeal ultrasound (TLUSG) is an excellent noninvasive tool for assessing the vocal cord function after thyroidectomy.¹⁻⁴ Ultrasound examination of vocal cords can be used for comprehensive monitoring of RLN and enhancing postoperative care in thyroid surgery by endocrine surgeons.⁵ We discuss in this article how we perform ultrasound for postoperative evaluation of vocal cords.

PROCEDURE

Endocrine surgeon performs ultrasound for the assessment of vocal cords postoperatively during the first visit in the outpatient department. The patient and relatives are counseled about the procedure. The postoperative vocal cord assessment is made by TLUS by endocrine surgeon facing the head end of the patient using 8- to 10-MHz probe. With subjects lying on back sandbag under the shoulder, neck slightly extended, vocal cords are assessed in axial (mid-transverse) view (Fig. 1). Vocal cord movement and symmetry during adduction and abduction are observed in B-mode. Probe is placed on thyroid cartilage prominence and angulated in order to visualize three landmarks, viz, most anterior portion of thyroid prominence, right and left arytenoids forming three corners of triangle. Hypochoic vocal folds extending from thyroid prominence to vocal processes of arytenoid on each side are visualized forming two hemi-triangles. Symmetry in the movement of vocal cords is assessed (Fig. 2) during quiet breathing (passive) and phonation and Valsalva maneuver as applicable. Video snips of vocal fold movements of each case are recorded for further analysis and for future study purposes. Cases with decreased or asymmetric

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vocal cord mobility and non-assessable by ultrasound are subjected to video laryngoscopy (VDL) for further assessment.

LANDMARKS

Various authors used different anatomical landmarks such as the false vocal folds, the true vocal folds and/or the arytenoids,^{3,6-8} different acquisition planes⁹ (axial or lateral view), and different testing conditions¹⁰ (free breathing, phonation, Valsalva maneuver). Many groups^{8,11,12} consider arytenoid cartilages as reliable landmarks to assess the vocal fold motion. A software indicating three landmarks on an axial B-mode plane: the two arytenoids and the most anterior and medial part of the thyroid cartilage, during free breathing¹³ was used for the calculation of automated symmetry and mobility indices to diagnose RLN palsy by Lazard et al.¹⁴ We used the thyroid prominence and bilateral arytenoids.

PROS

Transcutaneous ultrasound analysis of vocal cords by endocrine surgeon aids in postoperative monitoring of RLN to provide



Fig. 1: Position of the patient and position of probe

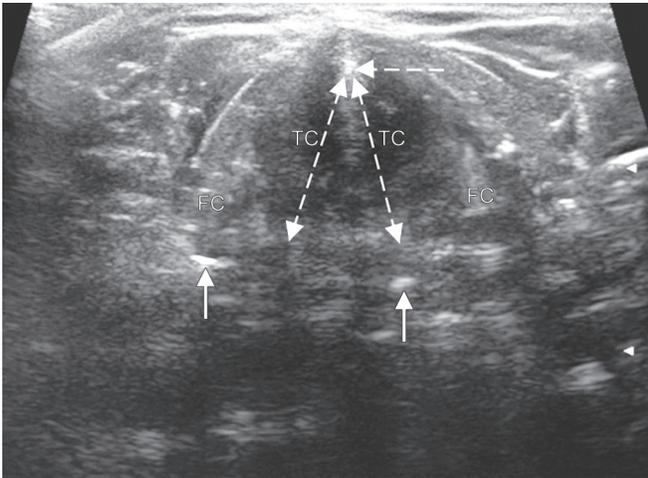


Fig. 2: Sonographic landmarks on transverse view of one of our patients post-thyroidectomy—thyroid prominence and vocal processes of bilateral arytenoids. Upward arrow—vocal process of arytenoid; horizontal arrow—thyroid prominence. TC: true vocal cord; FC: false vocal cord (two hemi-triangles are visualized with asymmetry in a case of RLN palsy post-thyroidectomy)

comprehensive care. TLUSG can be used as a teaching aid for RLN assessment in endocrine surgery teaching program. It is a noninvasive tool that is easy to learn and master, and USG-missed vocal palsy may not be clinically significant to impair the quality of life.

CONS

Observer bias and various patient factors with false negatives are a concern. Non-visualization of cords may hamper the utility in certain cases mostly in males and the elderly. Use of additional views and other adjuncts may be required in such cases.

CONCLUSION

As routine postoperative evaluation of vocal cords by laryngoscopy is not recommended, exact incidence of postoperative vocal

palsy is not known. Surgeon-performed ultrasound (SUS) can be an alternative modality to identify the hidden postoperative vocal palsy and to identify false positives and false negatives with Intraoperative Neuromonitoring (IONM). when utilized for RLN monitoring during thyroid surgery. Adequate visualization of vocal cords on transverse view alone is feasible in most patients; however, it may be difficult in the elderly and male patients.

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