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Visualization of the External Branch of the Superior Laryngeal Nerve During Video-Assisted Thyroidectomy

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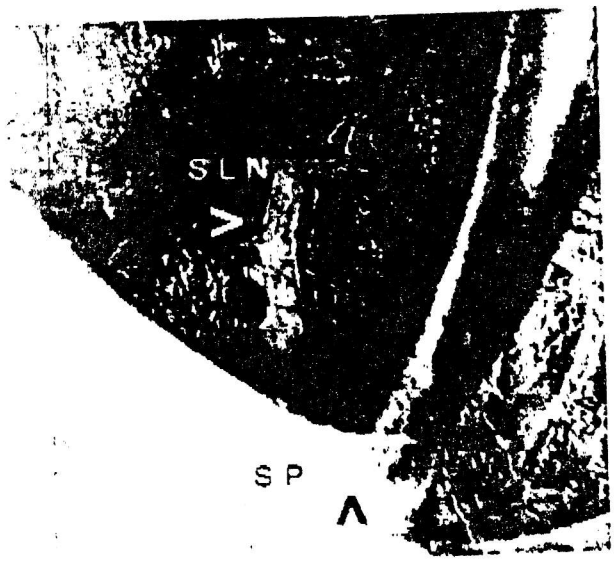

Figure 1. The external branch of the superior laryngeal nerve (SLN) lying on the surface of the cricothyroid muscle before the ligation of the upper pedicle (SP) of the thyroid.

Figure 2. The anastomotic branch (AB) of the external branch of the superior laryngeal nerve with the recurrent laryngeal nerve (RN) before its entrance in the larynx. The endoscope allows a straight, close, and magnified view of the area after the section of the right upper pedicle of the thyroid.

The external branch of the superior laryngeal nerve (ESLN) innervates the cricothyroid muscle, which regulates the tension of the vocals cords. Damage to the ESLN causes changes of the voice like hoarseness, weakness, decreased range of pitch or volume, and fatigue after extensive use. This complication will diminish the preservation of the recurrent laryngeal nerve during the same operation and can be a disaster, especially for singers and professional speakers.

Visualization of the ESLN, which always should be achieved,[1] is not routinely obtained during thyroidectomy because of the small diameter of this branch (0.2 mm), its very variable course, and the anatomic position (the space between the medial surface of the upper pole of the thyroid and the cricothyroid muscle, which is covered by the strap muscles). In about 10% to 15% of cases, the nerve runs within the cricothyroid muscle in its entire course, so it cannot be seen by direct inspection using any technique, but luckily, in this case it is not at risk.

To preserve the ESLN, most surgeons tend to avoid rather than expose the nerve, suggesting selective ligation of the upper pedicle vessels. In fact, the ESLN usually crosses the superior thyroid artery more than 1 cm above the upper edge of the superior thyroid pole (type 1) and successively runs on the surface of the cricothyroid muscle.[2] But this "blind" step will jeopardize the nerve variants type 2a and type 2b (20% to 35%) crossing the upper pedicle less than 1 cm, respectively, above and below the upper edge of the superior thyroid pole.[3]

In minimally invasive video-assisted thyroidectomy, a procedure introduced by Miccoli and colleagues in

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1998,[3] the 30-degree endoscope allows easier identification of the ESLN, giving a magnified view of the "critical space" during selective ligation of the upper pedicle (Fig. 1). During MIVAT we do not routinely search for the ESLN, and in our series consisting of more than 300 operations, we were able to visualize the ESLN in 65% of cases. Among these, the nerve ran entirely medial and separate to the superior thyroid artery in 85% of patients; it crossed the artery or its branches in the remaining patients.

In this particular case of video-assisted left thyroid lobectomy, anastomosis of the ESLN with the recurrent laryngeal nerve was visualized and the upper pedicle was sectioned under direct vision of the nerves (Fig. 2).

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