



Case report

INTERNAL-EXTERNAL LARYNGOCELE TREATED WITH EXCLUSIVELY TLM: HOW I DO IT.

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ABSTRACT

Laryngocele is a rare pathology with different grades of extension. Minimally invasive surgery, such as Transoral Laser Microsurgery, is also widely used for combined laryngocele (with internal and external components). In this paper, we show the step-by-step procedure for the treatment of a combined laryngocele with Transoral Laser Microsurgery. This technique allows us to obtain good clinical results: complete removal of the disease, short hospitalization, low morbidity, and rapid recovery. At clinical evaluation after three months, the patient showed no recurrence of the disease.

INTRODUCTION

A laryngocele is an abnormally dilated laryngeal saccular cavity that may be filled with air (classic laryngocele), mucus (laryngomucocele), or purulent secretions (laryngopyocele). Laryngoceles are classified as internal, which is confined to the endolarynx, external, which extends beyond the borders of the laryngeal cartilages, and combined, which has an internal and external component (1). It may be the result of a repeated increase in pressure in the upper respiratory tract, as may occur in glass workers or players of wind instruments; in rare cases is associated with occult squamocellular glottic carcinoma (2).

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Laryngocele is a rare condition. According to recent data, the incidence of the disease is 151 per 2.5 million people per year (1). The highest incidence is observed in the sixth decade of life, with a predominance in the male sex (males: females = 3:1). Nearly half of the laryngoceles are discovered incidentally, such as during head and neck examinations or CT and MRI examinations for other purposes (3).

Treatment of laryngoceles requires surgery (4). There are several types of surgery, mainly open or transoral. The choice of surgical technique depends on the location and extent of the disease (5), but also the surgeon's experience. Internal laryngoceles are usually treated with transoral procedures only, while external and combined laryngoceles may be treated with a combination of transoral and open transcervical approaches (6). Nowadays, Transoral Laser Microsurgery (TLM) is widely used with good results in external or combined laryngoceles, avoiding open surgery. This approach allows for a reduction of surgical and hospitalization time and surgical complications (7). The aim of this study is to show step by step how to manage a combined internal-external laryngocele with exclusively TLM.

MATERIALS AND METHODS

Before surgery, the patient underwent CT and MRI scans of the neck and fiberoptic endoscopic examination of the internal anatomy of the larynx. These findings provided a reliable assessment of the size of the laryngocele and its relationship to surrounding structures. Appropriate surgical planning can be made only after adequate clinical and radiological examination.

Written informed consent was obtained from the patient, and the surgical procedure was discussed in detail with the patient to inform her of the risks and benefits of the chosen technique. The surgical procedure is performed under general anaesthesia. Removal of the internal and external components of the laryngocele is performed under a surgical microscope and with CO₂ laser (9).

RESULTS

The patient was discharged the day after the procedure, without any particular problems. Since awakening after surgery, the patient breathed and spoke without difficulty. The voice remained unchanged. Food intake was also resumed regularly without any restrictions.

The patient underwent endoscopic follow-up 1 month and 3 months postoperatively. At the last checkup, a regular surgical result with complete mucosal healing at the laryngeal level was observed. Macroscopically, there were no signs of disease recurrence. In addition, the patient reported no symptoms related to the pathology; specifically, she reported no dyspnea, dysphonia, or dysphagia.

DISCUSSION

The treatment of laryngocele has evolved in recent years. Originally, almost all cases of laryngocele were treated through an open approach with various surgical procedures: transthyrohyoid membrane approach, thyrotomy with resection of the upper third of the thyroid cartilage, and V-shaped thyrotomy (8). Nowadays, the transoral approach is most commonly used because of its numerous advantages. Many authors have demonstrated successful transoral treatment of laryngocele in both internal and combined laryngocele. With increasing use of CO₂ laser (9), TLM is a less invasive technique that can be performed in less time compared with the open technique. Devesa et al (9) performed a retrospective study in which three patients with combined laryngoceles were treated with an endoscopic approach, with no complications and good clinical outcomes. Ciabatti et al (10) have shown that resection with CO₂ laser (9) is currently the preferred technique because it is precise, efficient, and safe compared with an open approach. In addition, the hospitalization of patients treated with the endoscopic procedure lasts only a few days, and patients make a full recovery more quickly. Moreover, there are no relevant effects on swallowing and speech in patients who have undergone endoscopic treatment of laryngocele (11). Patients can speak, drink and eat within a few hours of the procedure, without the need for medications or precautions.

Another surgical procedure that is gaining popularity for combined laryngoceles is transoral robotic surgery (TORS).

As an endoscopic procedure, this surgical technique offers all of the above advantages. In addition, the outer portion of the laryngocele can be better visualized because of its range of motion. However, it should be kept in mind that the choice of surgical technique depends primarily on the particular patient, the type of lesion, and also on the surgeon's skills and preferences.

In summary, the literature shows that the treatment of laryngocele has progressed since its initial description, from an open to an endoscopic approach. Recently, the robotic surgical approach has gained popularity. Nevertheless, the transoral approach with TLM is the first choice for internal laryngocele and selected combined laryngocele.

Surgical technique

In the following, we describe an exclusive TLM approach using CO₂ laser to treat an internal-external laryngocele. The patient underwent general anaesthesia, and a small-diameter reinforced tube was used. After exposure of the larynx with a rigid laryngoscope, the surgical microscope was positioned. The laryngocele was clearly visible through the right ventricular fold.

Step 1: Visualization of the larynx. The bulging at the level of the right ventricular fold, clearly visible, indicates the internal component of the laryngocele (Fig. 1);

Step 2: Incision of the upper part of the ventricular fold is performed with CO₂ laser until the capsule of the laryngocele is reached. A small cottonoid is placed to protect the tube (Fig. 2);

Step 3: The laryngocele is then cut, and its glue content is suctioned (Fig. 3);

Step 4: Once empty, the borders of the laryngocele are more clearly visible. At this point, the surgeon begins the detachment of the lateral wall of the capsule by gently pulling it medially (Fig. 4). This step is crucial to allow adequate mobilization, traction, and dissection to completely remove both the internal and external components of the laryngocele;

Step 5: If the external portion of the laryngocele is very deep, it might be useful to adopt a piecemeal dissection technique (Fig. 5);

Step 6: Once the excision is completed, the bottom of the ventricle is clearly visible. In this case, the surgeon preferred to preserve the more medial portion of the ventricular fold to allow better recovery (Fig. 6);

Step 7: Endoscopic inspection (Fig. 7) with an angled rigid 70° endoscope was performed to verify the complete removal of the laryngocele. Control was made 1 month after surgery. Recovery was nearly complete, with no evidence of residual lesion (Fig. 8).

Summary

Laryngocele is a very rare condition that can be life-threatening because it can lead to acute airway obstruction.

Many cases of laryngocele are detected incidentally.

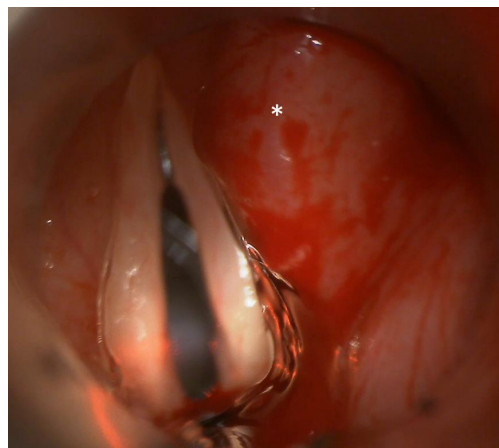


Fig. 1. Visualization of the larynx.

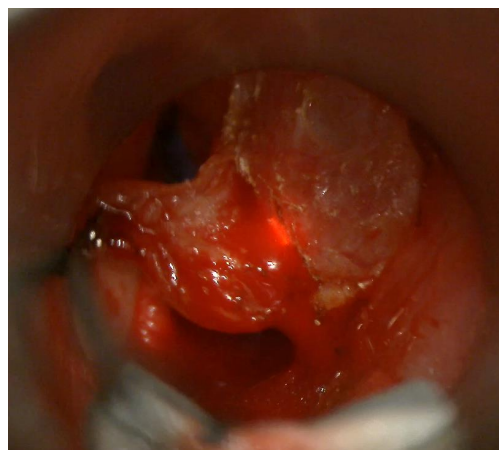


Fig. 2. Incision of the upper part of the ventricular fold is performed.

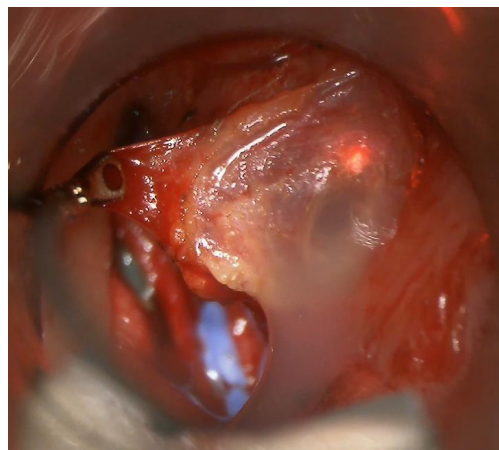


Fig. 3. Cut of the laryngocele.

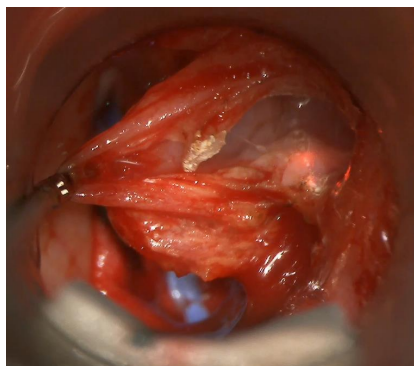


Fig. 4. Detachment of the lateral wall of the capsule.

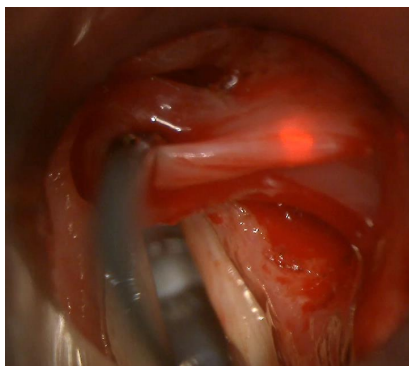


Fig. 5. dissection technique.

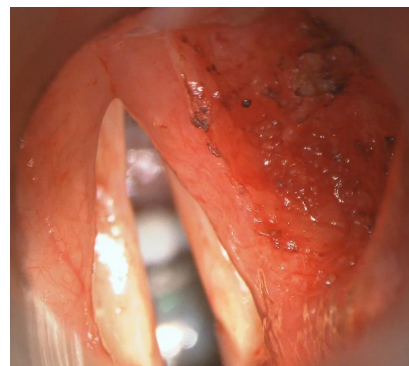


Fig. 6. the bottom of the ventricle upon completion of the excision.

Treatment of laryngoceles requires surgery and has evolved in recent years.

Internal laryngoceles are treated with an exclusively transoral approach, whereas combined internal and external laryngoceles are often treated with a combined transoral and open cervicotomic approach.

Surgery is performed under general anaesthesia.

Radiological examination must be performed before surgery to select the best surgical procedure.

The transoral approach with CO₂ laser for combined laryngoceles has fewer complications and morbidities and allows for a faster recovery and shorter hospital stay while maintaining satisfactory clinical outcomes.

There are no relevant effects on swallowing and speech in transorally treated patients.

TORS is becoming increasingly popular for combined laryngoceles.

The choice of surgical technique also depends on the surgeon's skills and preferences.

Author contributions

CL wrote the paper; VA edited the images; GM, performed the surgical procedure; RN, LB, GF and LS corrected the paper and supervised the whole work.

Conflict of interest

The authors have no financial relationship to disclose.

Ethical approval

All procedures performed in studies involving human participants conformed to the ethical standards of the Institutional and/or National Research Commission and the 1964 Declaration of Helsinki and its subsequent amendments or comparable ethical standards. The Clinical Trials Ethics Committee of the Provinces of Verona and Rovigo exempted this study from its approval. All authors read and approved the manuscript.

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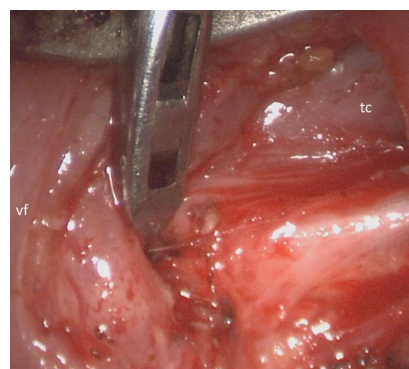


Fig. 7. Endoscopic inspection.



Fig. 8. Fiberoptic examination at 1 month post-surgery.

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