Operative Techniques in Otolaryngology 30 (2019) 255–258

Operative Techniques in
Otolaryngology

Open surgical approach to laryngoceles and saccular cysts

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KEYWORDS
Saccular disorders;
Saccular cyst;
Laryngocele;
Open approach

Saccular disorders extending beyond the thyrohyoid membrane are classified as external, or combined, based on to their extension beyond the thyrohyoid membrane and the proportion of the external to the internal component. The workup is the same as for internal saccular disorders and airway safety is of utmost importance. The open/transcervical approach is currently the treatment of choice for cases with relatively large external component. Endoscopic approach was also reported for combined lesions with a relatively smaller external component.

Introduction and relevant anatomy

The background of saccular disorders, relevant endolaryngeal anatomy, clinical presentation and workup, were reviewed in the previous section on the endoscopic approach to saccular disorder.

The thyrohyoid membrane stretches between the superior border of the thyroid cartilage and the upper margin of the posterior surface of the hyoid bone. Its medial part is thicker and termed the median thyrohyoid ligament. Posterolaterally on each side, the thyrohyoid membrane is pierced by the superior laryngeal bundle, comprised of the superior laryngeal vessels and nerve (Figure 1). An external/combined saccular disorder expands beyond the thyrohyoid membrane into the neck, pushing against the inner surface of the strap muscles, and resulting in a compressible neck mass (Figure 2A-B).

As mentioned in the previous section, in the experienced hands, endoscopic approach is also feasible for the treatment of combined saccular disorders with a relatively small external component.[1-3]

In the past, prior to the introduction of advanced endoscopic surgical instruments, an open approach (either by laryngofissure or lateral thyroidotomy) was the definitive treatment of choice for larger internal saccular disorders as well as for recurrent lesions.[3-6] Nowadays, the open approach is reserved mainly for patients presenting with a prominent external component of a saccular disorder. In cases when an internal component of the saccular disorder needs to be addressed as well, a combined approach can be executed.

Open approach for the management of saccular disorders

As mentioned in the previous section on the endoscopic approach to saccular disorders, in cases of respiratory distress, priority should be given for securing the airway. In cases of impending airway, the external component of a large saccular cyst or a laryngopyocele can be emergently decompressed by needle aspiration or incision and drainage in a similar fashion as a neck abscess.[7]

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http://doi.org/10.1016/j.otot.2019.09.006
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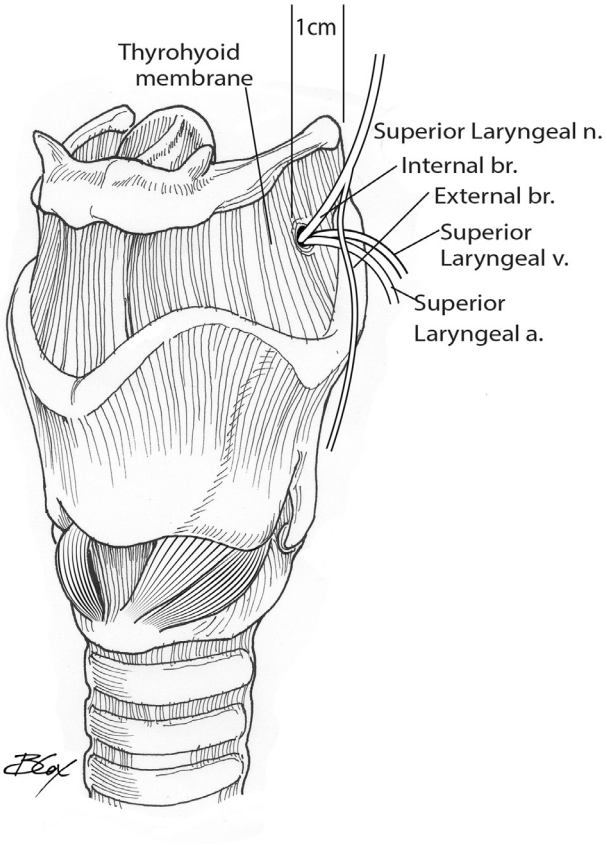

Figure 1 The laryngeal framework and thyrohyoid membrane. Note the superior laryngeal bundle piercing the membrane at its posterolateral aspect.

In addition to a transcervical approach to the external component of a saccular disorder, the endolarynx should be inspected for an occult malignancy. A lateral horizontal neck incision is performed over or just below the mass, at the level of the superior border of the laryngeal framework. The incision is carried down to the subplatysmal plane and flaps are elevated to expose the strap muscles and thyrohyoid membrane. The plane between the mass and the strap muscles should be identified and dissected by a combination of sharp and blunt dissection (Figure 3A). Ideally, the capsule of the lesion should not be violated. In cases of a relatively small external component of the saccular disorder, lateral/medial retraction of the strap muscles is sufficient. For larger lesions, division of the strap muscles will facilitate exposure. The thyroid lamina is exposed. In cases which the sac does not fully herniate through the thyrohyoid membrane, the latter should be further divided to expose its capsule. Attention should be addressed to the identification and preservation of the superior laryngeal bundle, typically posteriorly displaced. Blunt dissection is carried out 360° around the sac's "neck" towards its endolaryngeal component into the paraglottic space. By the conclusion of the dissection, the surgeon is left with a sac herniating from the paraglottic space through a defect in the thyrohyoid membrane (Figure 3B,C). The narrow endolaryngeal "neck" of the sac is then clamped, suture ligated and divided (Figure 3D, E). The wound is inspected for ruling out communication with the laryngeal lumen. The larynx is inspected endoscopically to address an internal component (when necessary), to rule out communication with the neck and to identify laryngeal edema that could prevent a safe extubation. When possible, remnants of the thyrohyoid membrane should be approximated and sutured, as well as the strap muscles if previously divided. Intra and perioperative steroids are administered. In 2 of the cases performed by the author, a small suction drain was left in the wound bed and removed the following day.

Laryngofissure and lateral thyrotomy are advocated by some authors in order to provide superior access to the paraglottic component of the combined saccular lesion. The lateral thyrotomy window can be fashioned in various shapes: a V shaped thyrotomy, rectangular "trap door" flap, resection of the upper third of the thyroid lamina, a vertical incision, etc. A perichond flap can be elevated

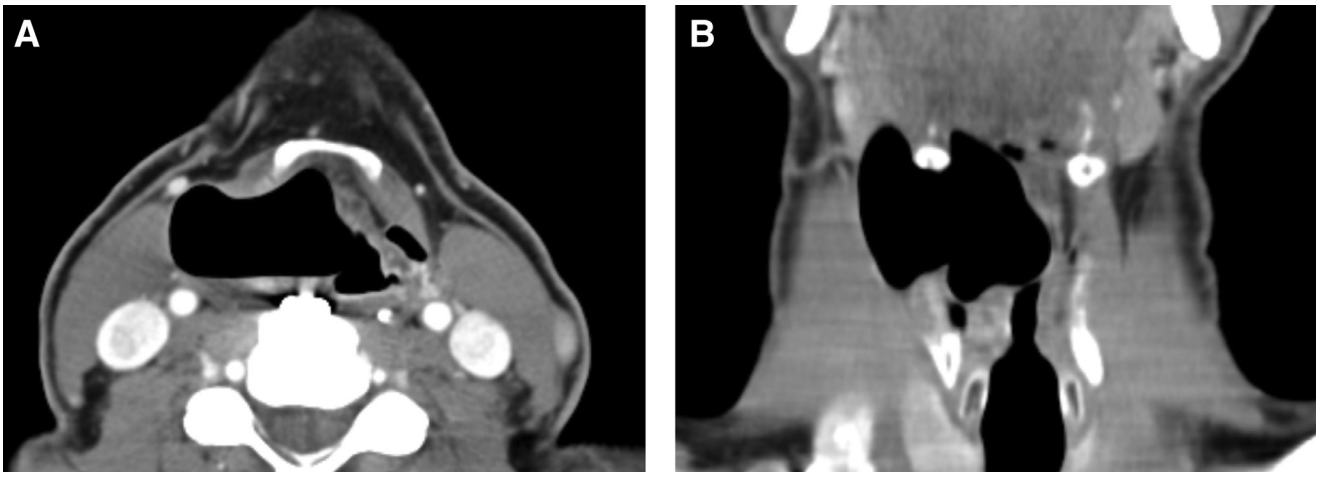

Figure 2 (A) Right combined laryngocele in a 52-year-old male patient. Contrast enhanced axial CT scan at the level of the hyoid bone demonstrates a large air filled structure extending from the endolarynx across the hyoid bone into the neck. (B) Coronal reconstruction further demonstrates the expansion of the laryngocele through the thyrohyoid membrane.

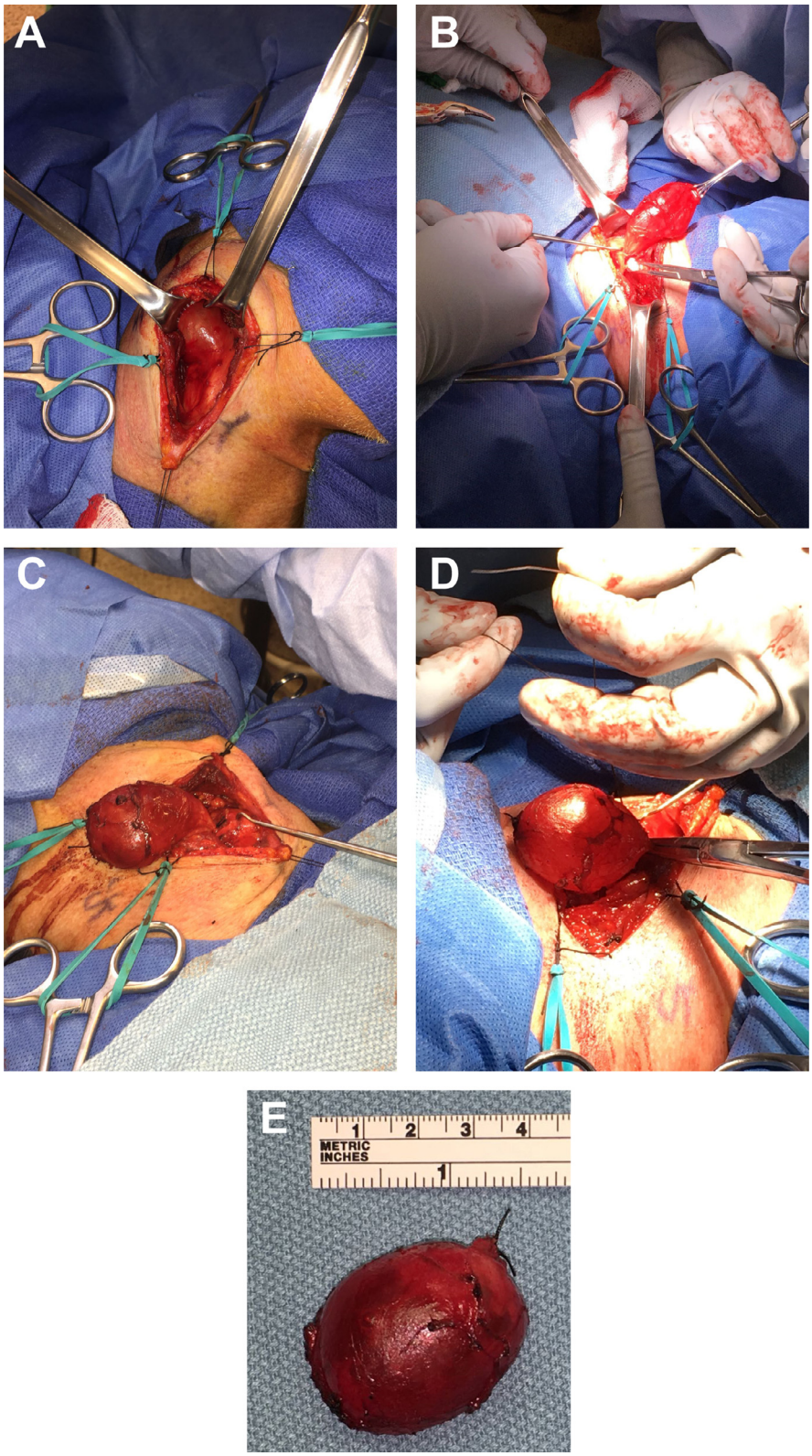

Figure 3 (A) Intraoperative photographs from the patient in Figure 2. The preserved capsule of the laryngocele is exposed following elevation of subplatysmal flaps and division of the strap muscles. (B) The laryngocele is bluntly dissected down to its endolaryngeal "neck." (C) The external component of the laryngocele is suspended on a narrow "neck" leading into the paraglottic space. The thyroid cartilage is retracted inferiorly with a hook in order to facilitate exposure. (D) The narrow "neck" of the laryngocele is gently pulled out from the paraglottic space, clamped and suture ligated. (E) The divided external component of the laryngocele.

of the cartilage and preserved for closure.[6,8-10] In 2 cases performed by the author, we did not find lateral thyrotomy necessary.

Complications and postoperative management

As with the endoscopic approach for saccular disorder, airway compromise is the major postoperative complication. Prior to extubation, laryngeal edema should be ruled out. Perioperative steroids along with antireflux medications are administered. In cases which an infected cystic component was resected, antibiotics should be administered as well. Consideration for keeping the patient intubated should be made in cases of significant laryngeal edema. Temporary tracheotomy is not frequently indicated in elective cases, and mainly reported in cases of patients presenting with acute airway compromise.[6,8] The patient should be frequently evaluated for neck emphysema or air leaking into the suction drain. Bleeding and the formation of neck hematoma is an additional complication, as with other open neck surgeries. Superior laryngeal nerve injury is another potential complication although to the best of our knowledge, in our review of the literature, was not reported. In cases which an internal saccular disorder component was addressed as well, the complications and postoperative management already discussed in the previous section also apply.

Conclusion

The transcervical approach is currently the treatment of choice for saccular disorders with a significant external component. In addition to exposure of the external component, this approach provides access to the paraglottic space as well. The reported morbidity and recurrence rates are low. In cases of combined lesions, a combined approach may be indicated. Occult laryngeal cancer should be ruled out, and airway safety is the major perioperative concern, as with internal saccular disorders.

Disclosures

The author has no funding, financial relationships, or conflicts of interest to disclose.

The author reports no proprietary or commercial interest in any product mentioned or concept discussed in this article.

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