Endoscopic assessment of the larynx before surgery of laryngocele

Essam Behary, Ahmed Abd Elhaleem
Otolaryngology Department, Shebin El-Koom, Menoufiya University, Egypt

Abstract

Objective: To emphasize the role of endoscopy in management of laryngoceles and to review their presentation and management. Study design: A retrospective review of charts, clinical, radiological and histopathological notes of patients with laryngocele treated over a 15 year period was undertaken. Patients and Methods: Retrospective study revealed 9 cases diagnosed to have laryngocele, 7 male (77.7%) and 2 females (22.3%), with an age range from 34 to 64 years (average = 52.8 years). All cases were professional voice users. Four cases (44.4%) had internal laryngocele, 3 cases (33.3%) had external laryngocele and 2 cases (22.2%) had mixed laryngoceles. There were 5 cases (55.6%) on the left side, 2 cases (22.2%) on the right side and 2 cases (22.2%) bilateral. The main presentation was dysphonia in 5 cases (55.6%), neck mass in 3 cases (33.3%) and hemoptysis in 1 case (11.1%). One case (11.1%) had laryngopyocele. Results: Endoscopic assessment with 0° and 90° rigid telescopes were done for all cases at the beginning and at the end of the procedure. Patients with internal laryngocele underwent endoscopic resection, while those with external or combined laryngocele were treated via external approach. Quality of voice was improved and no recurrences were encountered during the follow-up period which ranged from 9 month to 5 years. No evidence of laryngeal cancer was found on the histological examinations but we encounter a case of scleroma. Conclusion: Endoscopic evaluation of the larynx helps in diagnosis of hidden pathology and in resection of internal laryngocele. Laryngoceles can occur not only due to positive intralaryngeal pressure but also due to the presence of hidden pathology in the laryngeal ventricle.

Key words: laryngocele, rigid laryngoscope, dysphonia, neck mass.

Introduction

A wide variety of neck masses are encountered in clinical practice among these are laryngoceles. These are dilatations of the laryngeal saccule within the ventricle of Morgagni. They consist of a membranous sac located between the false vocal cord and the inner aspect of the thyroid cartilage. Laryngoceles sometimes expand medially resulting in swelling of the supraglottic larynx forming internal laryngocele, or they may dilate more laterally and breach the thyrohyoid membrane near the internal branch of the superior laryngeal nerve, causing external neck swelling or external laryngoceles. Mixed laryngoceles exhibit both components. Unilateral laryngoceles are uncommon clinical entities and bilateral laryngoceles are even rarer. The exact incidence of laryngocele is unclear, but its incidence appears to be more in men than women. The clinical presentation and the differential diagnosis of laryngocele is variable. For better assessment endoscopy of the larynx before surgical removal is usually done to exclude hidden pathology.

The external approach for the resection of a laryngocele either by laryngofissure approach or by lateral thyroidotomy has been advocated in some series, as has the endoscopic approach. The consensus appears to favor an external approach for the large and external laryngoceles, whereas the internal component may be excised endoscopically. Our aim was to delineate the value of endoscopy for evaluation and management of laryngoceles and to review the presentation of such a rare entity.

Patients and Methods:

A retrospective study on all cases of laryngocele managed in the Otolaryngology department, Menoufiya University Hospital between 1994 and 2009 was done. We reviewed the patients’ charts, radiological and surgical data. There were a total of 9 treated cases during that period, 7 males (77.8%) and 2 females (22.2%), with age range from 34 to 64 years (Mean= 52.89 ± 8.89). All cases were professional voice users e.g. Argol player, muezzin. All patients had an ultrasound and CT scan for diagnosis. All patients had endoscopic examination of the laryngeal ventricle pre and post excision of the cyst, using 0° and 90° rigid Hopkins telescopes. Endoscopic evaluation was done at the beginning of the procedure in all cases. Any
suspicious lesion around the ventricle was looked for and biopsied. At the end of the procedure, endoscopy was also done to ascertain complete removal of the internal part. Pathology reports were reviewed for final diagnosis.

Statistical analysis: Qualitative data were expressed as number and percentage and analyzed by applying chi square (X²) test. Quantitative data were expressed as mean and standard deviation and were analyzed by applying student t-test. These tests were used as tests of significance at P <0.05 using SPSS.

Results

A retrospective study on 9 cases diagnosed to have laryngocele in the last 15 years, revealed that the main prevalent presentation was dysphonia in 5 cases (55.6%), followed by neck mass in 3 cases (33.3%) and the least presentation was hemoptysis in only 1 case (11.1%). We found 4 cases with chronic chest troubles (2 with chronic bronchitis and 2 with emphysema). Four cases had internal laryngocele, 3 cases external and 2 cases combined. Five cases were on the left side, 2 cases were on the right side and 2 cases were bilateral (Figure 1,2).

Most prevalent clinical picture was dysphonia (55.6%), followed by neck mass (33.3%) then hemoptysis (11.1%). Most of the lesions were unilateral (77.8%), internal laryngocele (44.4%) and on the left side (55.6%) (Table 1).

Table 1: Number and percentage distribution of clinical picture of cases

<table>
<thead>
<tr>
<th>Clinical picture</th>
<th>Number</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>Dysphonia</td>
<td>5</td>
<td>55.6%</td>
</tr>
<tr>
<td>Neck mass</td>
<td>3</td>
<td>33.3%</td>
</tr>
<tr>
<td>Hemoptysis</td>
<td>1</td>
<td>11.1%</td>
</tr>
</tbody>
</table>

Table 2: Number and percentage distribution according to type of surgery

<table>
<thead>
<tr>
<th>Type of surgery</th>
<th>Number</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>External approach</td>
<td>5</td>
<td>55.6%</td>
</tr>
<tr>
<td>Endolaryngeal endoscopic laser assisted</td>
<td>4</td>
<td>44.4%</td>
</tr>
</tbody>
</table>

External approach was used for excision of external and combined laryngocele in 5 cases, while endoscopic approach with the use of laser was used in 4 cases of internal laryngocele (Table 2) (Figure 3). In our series, patients who had an external approach had a tracheotomy in 40% of the cases. Three of the patients treated had airway obstruction after surgery, which necessitated tracheostomy. Decannulation was subsequently performed shortly after the operation in all 3 cases. The bilateral laryngoceles were removed on two separate occasions with 3 to 6 months interval.

Figure 1: Right internal laryngopyocele

Figure 2: Mixed laryngocele

Figure 3: Endoscopic view of internal laryngocoele

Figure 4: Cystic space with thick fibrous wall (H&E)

Figure 5: High power view showing chronic inflammatory infiltrate and marked edema (H&E X 400)

External approach represented 55.6% of the studied group and endolaryngeal endoscopic laser assisted represented 44.4% (Table 2). Endoscopic examination revealed the presence of a polyp in 2 cases, an area of leukoplakia in one case, an elevated lesion in one case, and thickening in 5 cases. Biopsy was taken from all cases.
The histopathological examination proved to be chronic non specific inflammation in 5 cases (55.5%), followed by simple laryngeal polyp in 2 cases (22.2%), scleroma in one case and dysplasia in the last case (11.1%). The most prevalent histopathological picture was chronic non specific inflammation (55.5%) followed by polyp (22.2%) and lastly scleroma and leukoplakia (11.1%) (Figure 4.5). The time of hospitalization was significantly lower among the endoscopic group (2.75 days ± 0.96) than the external approach group (19.2 days ± 1.79) (P<0.01). No recurrence was noted during the follow-up period (range= 9 months to 5 years). The time of hospitalization was significantly lower among endolaryngeal endoscopic laser assisted group than external approach group (P<0.01).

Although there was no case with endolaryngeal endoscopic laser assisted removal, needed a tracheotomy, 40% with external approach had a tracheotomy (p > 0.05). There is a trend that with using external approach the prevalence of tracheotomy increase but it is not significant in comparison with endolaryngeal endoscopic laser assisted (P>0.05), this may be due to small sample size if the sample size increase the difference may appear (Table 3).

All cases were professional voice users. The bilateral laryngoceles were removed on two separate occasions with a 3 to 6 months interval. Three patients had emergency airway obstruction after surgery, which necessitated tracheostomy. In these three cases, decannulation was subsequently performed shortly after surgery. The follow-up period which ranged from 9 months to 5 years, showed no recurrence of the lesions.

**Discussion**

Laryngocele is a rare disease defined as a symptomatic dilatation of the laryngeal sacculle, which rise higher than the upper border of the thyroid cartilage. Laryngoceles are unilateral in 85% of cases and present most commonly with hoarseness and a visible or palpable lump in the neck. There are currently two theories regarding the etiological factors for laryngocele. MacFie and Holinger, 1966, stated that prolonged periods of increased pressure within the laryngeal lumen could result in gradual dilation of the sacculle and this is in agreement to our study as all cases in our study is voice abuser. Amin and Maran, 1988, pointed out the presence of acquired factors such as local laryngeal disease (i.e. carcinoma) that could cause an increased intraventricular pressure as a result of a valvular effect restricting the exit of air from the sac. The latter hypothesis is supported by the frequent association of laryngocele with squamous cell carcinoma of the larynx as high as (28.8%)2-3. In our study we found an unexpected case of scleroma affecting the supraglottis and causing the laryngocele. This might be added to the recommendation of endoscopy to be mandatory in evaluating all cases of laryngocele.

The diagnosis of laryngocele can be based purely on clinical features or assisted by imaging. Computed tomography scanning provides a definitive diagnosis of a laryngocele. In our study we have 9 cases in 15 years since 1994 with higher incidence in male than female (7 male (77.7%) and 2 female (22.3%). The age ranged from 34 year to 61 year with a mean of (52.8 y),With a peak in the 5th decade, laryngocele was unilateral in (77.8%) of our cases and bilateral in (22.2%), on the left side in (55.6%) and right side in (22.2%). The main presentation in our cases was dysphonia and neck lump with its characteristic features. Other authors have reported findings similar to our own results and founded laryngoceles to be unilateral in 85% of cases and to present most commonly with hoarseness and a visible or palpable lump in the neck.

Different surgical approaches to laryngoceles have been reported. Aspiration of the cyst and injection of sclerosing agents are of little benefit in large cysts and may simply occlude the neck, leaving the sac intact to progress to a laryngomucocoele. Excision of the laryngocele can be performed externally or endoscopically. Several reports have advocated the use of the external approach.
only\textsuperscript{8–10}. Recently other authors have been in favor of the endoscopic excision of the laryngocele with or without the use of laser\textsuperscript{11–13}. In our study the internal component was approached endoscopically and laser was used for excision of the sac. The external and combined laryngocele were approached externally through lateral thyroidotomy. This approach has the advantage of easy access to the laryngocele with a low recurrence rate, but with associated morbidity and the need for tracheotomy cover in most cases and a prolonged hospital stay. Advances in the endoscopic techniques have led to a shift toward endoscopic management, especially for excision of the internal component of the laryngocele\textsuperscript{8,13,14}. This approach provides evaluation of hidden pathology, good functional recovery and early discharge from hospital. The combined laryngocele still presents a surgical dilemma. Only one report, by Szwarc and Kashima, 1997, has described such a case treated by endoscopic laser resection, explaining how the technique avoids potential damage to the superior laryngeal vessels\textsuperscript{12}. Endoscopic evaluation of the larynx help in diagnosis of hidden pathology and in resection of internal laryngocele. This can provide a reliable and cost-effective method to minimize hospitalization.

Endoscopic evaluation of the larynx help in diagnosis of hidden pathology and in resection of internal laryngocele, this provides a reliable and cost-effective method that minimizes hospitalization and the need for tracheostomy. We believe that advances in the applications of laser in microlaryngosurgery will alter the traditional management of all types of laryngoceles.

### References