Is Partial Laryngectomy Safe Forever?

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ABSTRACT

Objective: Over past decades, function-preserving surgery has been found oncologically effective for specific types of laryngeal cancer. Safe short-term swallowing function has been reported, but swallow safety during long-term survival has received less attention. The purpose of this report is to bring consideration to potential consequences of late dysphagia and chronic aspiration after partial laryngectomy.

Method: A retrospective case series was performed. The head and neck cancer database from Yale-New Haven Hospital identified 3 patients requiring completion laryngectomy due to chronic aspiration 11-15 years after oncologically successful partial laryngectomy.

Results: Primary treatment was open supraglottic laryngectomy with adjuvant radiation therapy (n=2) and vertical hemilaryngectomy (n=1). Swallow function was preserved for >10 years postoperatively. Due to late dysphagia and chronic aspiration, two patients required completion laryngectomy 11 and 15 years postoperatively and the third patient will require his 14 years postoperatively, despite locoregional control.

Conclusion: Successful swallowing after function-preserving laryngeal surgery may not last forever. All patients presented with aspiration 11-15 years after partial laryngectomy who required definitive completion laryngectomy. This observation may affect preoperative counseling and consideration for longer post-operative follow-up. The data encourage a larger sample size.

INTRODUCTION

Over past decades, function-preserving surgery has been found oncologically effective for specific types of laryngeal cancer. Long-term locoregional control has been reported in the literature for T1, T2, and selected T3 laryngeal cancers. 1, 2 Furthermore, function-preserving laryngeal surgery in properly selected patients has allowed for life-long preservation of phonation. 3 The benefits of this treatment approach are that it combines oncologic control with positive psychosocial outcomes for patients.

Function-preserving surgery also has risks. Initially, there was concern that alteration and removal of the supraglottic anatomy would cause dysphagia and aspiration. In open supraglottic laryngectomy and vertical hemilaryngectomy, the infrathyroid muscles are detached and sections of the laryngeal cartilage and healthy mucosa are removed for the sake of tumor resection. Even with meticulous preservation of the superior laryngeal nerve, this alters the anatomic movements needed to complete the swallow function. 4, 5 While the development of endoscop ic laser techniques for supraglottic laryngectomy has obviated the need for external dissection in many cases these techniques still functionally alter the endolaryngeal soft tissues.

Concern for dysphagia and aspiration after these procedures prompted investigation into functional outcomes. Safe swallow function has been reported over relatively short term post-operative periods. 6 However, less attention has been paid to evaluating these concerns in the longer term. The purpose of this case series is to highlight the potential consequences of late dysphagia and chronic aspiration after function-preserving partial laryngectomy.

METHODS AND MATERIALS

A retrospective case series was performed. The head and neck cancer database from Yale-New Haven Hospital was used to identify 3 patients requiring completion laryngectomy due to chronic aspiration 11-15 years after oncologically successful partial laryngectomy. Demographics, presentation, treatment, and course are included.

Primary treatment was open supraglottic laryngectomy with adjuvant radiation therapy (n=2) and vertical hemilaryngectomy (n=1).

Swallow function was preserved for >10 years postoperatively. Due to late dysphagia and chronic aspiration, two patients required completion laryngectomy 11 and 15 years postoperatively and the third patient will require his 14 years postoperatively, despite locoregional control.

CONCLUSION

Information gleaned from this small case series is useful to the head and neck surgeon. It may be prudent to preoperatively counsel patients regarding the possibility of late onset dysphagia and aspiration after function-preserving partial laryngectomy. These patients should also be followed for more than 5 years after being disease-free to survey for the development of late-onset dysphagia.

REFERENCES


RESULTS

She was treated with an open supraglottic laryngectomy and resection included the epiglottis, right false cord, right aryepiglottic fold, and a portion of the right arytenoid cartilage. She received adjuvant radiotherapy to 59.4 Gy.

Three years post-operatively she began to notice mild dysphagia to liquids. Modified barium swallow showed aspiration (Fig. 2). She had no symptoms of pneumonia. She began using supraglottic swallow techniques with good symptom relief.

Eight years post-operatively she developed recurrent dysphagia. She had episodes of frank choking and lost 11 pounds over a 6 month period. A year later she had an episode of aspiration pneumonia requiring IV antibiotics.

Now 14 year post-op, she reports episodes of fever and cough at home treated by her PMD with oral antibiotics. MBS demonstrates aspiration of thick liquids, inconsistently resolving with supraglottic swallow. She defers gastrostomy tube and completion laryngectomy despite recommendations.

Case 3
Patient 3 is a 77 year old man with a history of left base of tongue squamous cell carcinoma treated successfully with left functional neck dissection, iodium seed implantation to the tongue base, and external beam radiation therapy to a total of 60 Gy who presented 10 years later with T2N0 glottic squamous cell cancer. He was treated with a right vertical hemilaryngectomy.

Seven years post-op he was developed severe acute bronchitis and a year had steady weight loss and dysphagia. FEES demonstrated pharyngeal dysphagia and laryngeal penetration of liquids.

Despite dietary changes and aspiration precautions, he was hospitalized three times for respiratory difficulty over the next 6 months and was found to be aspirating contrast on MBS. A gastrostomy tube was placed and he was made NPO.

Nevertheless, he continued to suffer from aspiration and required completion laryngectomy 11 years post-op.

Table 1. Summary of Patients.

<table>
<thead>
<tr>
<th>Case</th>
<th>Primary</th>
<th>Treatment</th>
<th>Radiation</th>
<th>Aspiration</th>
<th>G-Tube</th>
<th>Laryngectomy</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>T2N1 SCCa of L epitholit</td>
<td>Open supraglottic laryngectomy bilateral MRND</td>
<td>Yes, to 60 Gy</td>
<td>12 years post-op</td>
<td>Yes</td>
<td>Yes, 15 years post-op</td>
</tr>
<tr>
<td>2</td>
<td>T2N0 SCCa of R false cord</td>
<td>Open supraglottic laryngectomy bilateral MRND</td>
<td>Yes, to 59.4 Gy</td>
<td>8 years post-op</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>3</td>
<td>T2N0 SCCa of R true cord</td>
<td>Vertical hemilaryngectomy</td>
<td>Yes, to 60 Gy for a previous aspiration</td>
<td>8 years post-op</td>
<td>Yes</td>
<td>Yes, 11 years post-op</td>
</tr>
</tbody>
</table>

DISCUSSION

The occurrence of aspiration has been extensively studied in healthy adults. 7, 8 Aspiration has been identified in cohorts of healthy adults and when followed over time remains stable without pulmonary complications. 9 Healthy individuals may be at low risk for pulmonary complications, but this may not be true for representative patients with laryngeal cancer.

These patients may be to be long-standing smokers and older in age. Chronic tobacco exposure induces changes in the mucociliary transport of the tracheobronchial tree. Histopathology of the bronchial mucosa of smokers have displayed chronic ultrastructural ciliary changes. 10 Worse outcomes of deglutition and aspiration after supraglottic laryngectomy were associated with increased tobacco use. 11 Increased age is associated with decreasing laryngeal mucociliary transport function. 12 Possibly these changes lead to decreased tolerance of aspiration as compared to the healthy adult.

Studies show adequate functional outcomes in short-term after supraglottic laryngectomy. 13 Our cohort of patients remained free of dysphagia for many years post-operatively but over time developed dysphagia, aspiration, and recurrent pneumonia.

The late onset dysphagia in this series is likely multifactorial. All patient received radiotherapy. Radiotherapy as a primary modality can have devastating long-term effects. In a retrospective series patients treated primarily with radiotherapy for head and neck cancer developed late-onset dysphagia and aspiration 5 years or more after completion. 13 In our series, two patients received adjuvant radiotherapy to standard doses of ~60 Gy and a third received radiotherapy 10 years prior for an initial tongue base primary lesion.

CONCLUSIONS

Information gleaned from this small case series is useful to the head and neck surgeon. It may be prudent to preoperatively counsel patients regarding the possibility of late onset dysphagia and aspiration after function-preserving partial laryngectomy. These patients should also be followed for more than 5 years after being disease-free to survey for the development of late-onset dysphagia.