Abstract

Objective: To evaluate the post-operative complications of suspension laryngoscopy (SL), and determine if protection of dentition and oral mucosa and limiting suspension times decreases the overall incidence of oral cavity and pharyngeal complications of SL.

Study Design: Retrospective case series review

Setting: Community-based otolaryngology practice

Subjects and Methods: All cases of suspension laryngoscopy (SL) performed by one surgeon from November 2008 through September 2014 were retrospectively reviewed. A novel technique for dental and mucosal protection was utilized, and suspension times were limited to 30 consecutive minutes. The incidence of postoperative complications was calculated and analyzed with respect to gender, smoking status, dentition, laryngoscopy type, and suspension system.

Results: 213 consecutive SL cases were reviewed including 174 patients (94 male, 80 female). The overall postoperative complication rate was 3.8%. For instance, a 1600 x 1200 pixel photo will usually look fine up to 8" x 10" when printed. If you think that an image might be too small, you can test it out by printing it at 100%. This will give you a good idea of what it will look like in print. If you want to know what it will look like in print, you can test it out by printing it at 100% when previewing your poster.

Conclusion: Until recently, little was known about the complications of SL, and variable rates have been reported. Only 8 out of 213 cases in this series experienced complications, which is significantly less than other reports. Consistent protection of dentition and oral mucosa, and limiting suspension times to 30 minutes are factors unique to our series and bear significance in reducing complications in endolaryngeal surgery.

Methods and Materials

The study was determined to be exempt for review and approval by the Lake Erie College of Osteopathic Medicine (LECOM) Institutional Review Board. All cases of SL performed by the senior author (R.A.F.) from November 2008 through September 2014 were retrospectively reviewed. Statistical analysis was performed on the collected data. A Chi Square test was used to determine statistical significance for incidences using a level of p < 0.05 for significance.

All patients underwent rigid direct laryngoscopy under general anesthesia. Various laryngoscopes and suspension systems were used. If maxillary dentition was present, a dental guard was placed over the teeth and two dampened gauze sponges were used to reinforce the dental guard and provide additional protection to the upper lip and gingival mucosa. In edentulous patients, four dampened gauze sponges were placed over the upper alveolar mucosa and lip for protection. In addition, suspension time was limited to thirty consecutive minutes in every case. During cases where more than thirty minutes of suspension time was necessary, patients were relieved of suspension for several minutes prior to resuming the laryngoscopy.

Results

A total of 213 consecutive SL cases were reviewed in this study involving 174 patients (94 male, 80 female). The average patient age was 58.5 years, and ages ranged from 24 to 89 years. A variety of procedures were performed for both benign and malignant lesions.

The most common postoperative complaint after SL was “sore throat” occurring in 29% of cases, followed by “hoarseness” which occurred in 23%. Forty-seven percent of cases reported no complications after surgery.

Four patients in the series experienced complications related to altered sensation in the tongue postoperatively for an overall incidence of 1.9%. Two patients in the series experienced oral mucosal alterations after SL. There was one dental injury in the series, and one patient experienced a nasal tip burn from the light carrier during SL. Altogether, these eight complications represent a postoperative complication rate of 3.8% in this series.

Discussion

The overall complication rate after SL in this series was 3.8%, which is lower than any reported in the literature to our knowledge. Like other reports, our complications were classified into dental, mucosal, or nerve injuries. The incidence of complications was greater among female patients (5.8%) versus males (2.4%), though this was not significant (p = 0.19). In addition, the incidence of other factors associated with complications were compared such as smoking status, dentition, suspension system, and scope type, and none were shown to be significant.

The overall decrease in incidence of complications in this series compared to other series can be contributed to two primary factors. First, unlike other reports, the consecutive suspension time in this series was limited to thirty minutes in all operative cases. Decreasing time of suspension is thought to thereby limit both stretch and compression of the lingual nerve, which are physiologic factors considered responsible for tongue symptoms after SL. In particular, ischemia has been shown to be a primary characteristic involved in nerve stretch injuries.

A second factor related to our study population that has likely contributed to a relatively low complication rate is using an adequate and consistent method for protecting the dentition, lips, and oral mucosal surfaces. In contrast to our results, other series have observed incidences of oral cavity lesions as high as 51% while using only a standard dental guard for protection.

This series therefore demonstrates that a consistent technique emphasizing limited suspension time and greater protection of the teeth and oral cavity mucosa can limit oral and pharyngeal complications of SL.

Table 2. Incidence of Postoperative Complications after Suspension Laryngoscopy

<table>
<thead>
<tr>
<th>Gender</th>
<th>Total No. of Cases</th>
<th>Patients with Complications</th>
<th>P*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>127</td>
<td>3</td>
<td>2.4</td>
</tr>
<tr>
<td>Female</td>
<td>86</td>
<td>3</td>
<td>5.8</td>
</tr>
</tbody>
</table>

*Chi Square test

Table 1. Characteristics among patients who experienced complications

<table>
<thead>
<tr>
<th>Complication</th>
<th>Gender</th>
<th>Smoking Status</th>
<th>Dentition</th>
<th>Suspension System</th>
<th>Scope Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Left Tongue numbness</td>
<td>Male</td>
<td>Former smoker</td>
<td>Dentulous</td>
<td>Leary</td>
<td>Ossa Off Pilling</td>
</tr>
<tr>
<td>Tongue Ulceration of upper and lower alveolar ridges</td>
<td>Female</td>
<td>Non-smoker</td>
<td>Edentulous</td>
<td>Leary</td>
<td>Ossa Off Pilling</td>
</tr>
<tr>
<td>Left nasal tip burn</td>
<td>Male</td>
<td>Non-smoker</td>
<td>Dentulous</td>
<td>Zeitzels UMG</td>
<td>Zeitzels 84</td>
</tr>
<tr>
<td>Burning sensation of tongue</td>
<td>Female</td>
<td>Non-smoker</td>
<td>Edentulous</td>
<td>Leary</td>
<td>Ossa Off Pilling</td>
</tr>
<tr>
<td>Loose right mandibular tooth</td>
<td>Female</td>
<td>Non-smoker</td>
<td>Edentulous</td>
<td>Leary</td>
<td>Ossa Off Pilling</td>
</tr>
<tr>
<td>Right upper lip tenderness</td>
<td>Female</td>
<td>Smoker</td>
<td>Edentulous</td>
<td>Leary</td>
<td>Dedo</td>
</tr>
</tbody>
</table>

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References