Airway Management in Ludwig’s Angina: An Otolaryngologic Perspective

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INTRODUCTION

• Ludwig’s angina was originally described by Wilhelm Friedrich von Ludwig in 1836. The term angina was used to describe the sensation of choking and suffocation patients often suffer from with this infection.

• Ludwig’s angina is defined as a severe and rapidly spreading cellulitis involving the following spaces:
  - submandibular space
    - Superior border: mylohyoid muscle & inferior border of mandible
    - Anterior border: anterior belly of digastric muscle
    - Posterior border: posterior belly of digastric muscle
    - Inferior border: mylohyoid muscle
    - Superficial border: platysma muscle & investing layer of deep cervical fascia
  - sublingual space
    - Superior border: oral mucosa
    - Inferior border: mylohyoid muscle
  - submental space
    - Superior border: deep cervical fascia, platysma muscle, superficial cervical fascia
    - Deep border: mylohyoid muscle
    - Lateral borders: anterior bellies of the digastric muscles

• The precipitating cause of infection is odontogenic in 85% of cases (Wasson). Other causes include trauma, peritonsillar abscess, parapharyngeal abscess, epiglottitis, and sialadenitis.

• Common presenting symptoms of Ludwig’s angina include:
  - odynophagia
  - dysphagia
  - drooling
  - toothache
  - fever
  - induration of the entire floor of mouth with tongue elevation
  - tender induration and erythema of the anterior neck

• Tachypnea, stertor, increased work of breathing, and respiratory distress are late, and worrisome findings. Progression through the above symptoms is rapid and complete airway obstruction and death can occur within hours of presentation.

• Due to the rapid progression and life-threatening nature of airway obstruction, the overriding priority when evaluating a patient suspected to have Ludwig’s angina is that of airway management.

METHODS AND MATERIALS

A retrospective chart review was undertaken over a six year period at our institution. Admission diagnoses of Ludwig’s angina and deep neck infections were used to identify patients to be included in the study. Each chart was reviewed for confirmation of the diagnosis and twenty-two patients were identified as having a diagnosis of Ludwig’s angina. Demographic information, airway management strategy, length of hospital stay, surgeries performed, and complications were gathered from the patient charts.

RESULTS

Of the 22 patients in this study, 7 (32%) received an awake tracheostomy, 4 (18%) were fiberoptically intubated and then a tracheostomy performed, 5 (23%) were fiberoptically intubated, and 6 (27%) were observed without airway intervention. Therefore 11 (50%) of the patients in this sample received a tracheostomy for airway control. Average length of stay for patients receiving a tracheostomy was 8.8 days versus 6.0 days for fiberoptically intubated patients and 3.3 days for patients who were observed (Figure 1). One patient who underwent tracheostomy was unable to be decannulated secondary to obstructive sleep apnea and tracheomalacia. None of the patients in the observation group underwent additional procedures during their hospital stay. All patients in a group in which airway intervention was performed underwent incision and drainage (I&D) and/or dental extractions. Two patients in the awake tracheostomy group required multiple I&D’s.

DISCUSSION

• A logical approach to the management of Ludwig’s angina must be in place for optimal outcomes (please see suggested algorithm in Figure 2).

• In early Ludwig’s angina, observation in a monitored environment is safe and appropriate.

• Because Ludwig’s angina can be rapidly progressing, a plan to establish a safe airway must be in place throughout the hospital course of conservatively treated patients.

• As the majority of patients will require invasive airway management, protocols should be established with anesthesia to facilitate rapid and safe airway management.

CONCLUSIONS

• There are clearly a small subset of patients with Ludwig’s angina in whom observation is a safe and appropriate treatment algorithm (Marple).

• Our experience reflects that those who present early in the course of the infection can safely be treated in a monitored setting.

• In our series, the majority of patients (16/22) required invasive airway management.

• The form of management depended upon the preference of the attending surgeon and the comfort level of the anesthesiologist with fiberoptic airway intubation.

• Half of our patients required a tracheostomy as the final form of airway control.

• Therefore, the possibility and preparation for tracheostomy should be considered when evaluating any patient with suspected Ludwig’s angina.

• Tracheostomy as the final form of airway control was associated with a longer hospitalization.

• In our series, airway management with observation and awake fiberoptic intubation, when appropriate, can result in a shorter hospitalization.

REFERENCES