Airway collapse after attempt of intubation in a patient with pharyngeal mucosal space abscess: a case report

Napadon Tangjaturonrasme
Department of Otolaryngology, Faculty of Medicine, Chulalongkorn University, Bangkok 10330, Thailand

Background: Pharyngeal mucosal space abscess is a very rare deep neck infection. Due to the anatomical relationship with the pharyngeal airway, patient may have some signs and symptoms of upper airway obstruction. Decision in airway management is important to reduce morbidity and be able to drain the abscess.

Objective: To report a potential devastating airway complication in a patient with pharyngeal mucosal space abscess during intubation.

Method: A patient with pharyngeal mucosal space abscess was treated and served as basis of this report.

Results: After several attempts of oral intubation, the abscess was ruptured and caused acute upper airway obstruction. Surgical cricothyroidotomy was made, and converted to tracheotomy later to secure the airway. Abscess finally drained through vertical incision on the pharyngeal lumen without further complication.

Conclusion: Serial aspirations should be considered in case of pharyngeal mucosal abscess to eliminate risk of ruptured abscess and airway collapse from intubation procedure. In case of successful intubation, small vertical incision on the pharyngeal wall might make adequate drainage without any scar post-operatively.

Keywords: Cricothyroidotomy, intubation, pharyngeal mucosal space abscess, tonsillitis.

Deep neck infection is still a problem despite usage of antibiotics. Risk factors include diabetes, poor oral hygiene, and patients who receive immuno-suppressive medications [1].

The author presents a patient with abscess of the pharyngeal mucosal space. This case is very rare, and physical findings can mimic abscess in parapharyngeal space, which requires different management. In fact, this patient could have developed airway collapse, which requires surgical airway management.

Case presentation
A Thai 70-year-old male patient, known case of diabetes, hypertension, and dyslipidemia, presented with sore throat and low-grade fever. Symptoms persisted, and he became worse on the right side and developed high grade fever. He was diagnosed with acute exudative tonsillitis, and treatment with Ceftriaxone® intravenously was started. After two days, symptoms became worse. High fever, severe sore throat, muffled voiced and odynophagia developed. Physical examination revealed swelling of the right tonsil and the uvula slightly deviate to the left, bulging at the right lateral pharyngeal wall from the level of soft palate down to the level of the epiglottis (see Fig. 1). True vocal cords were poorly identified due to swelling of the lateral pharyngeal wall. The patient remained conscious without trismus and others sign of airway obstruction.

A plain film AP/lateral neck showed a deviated pharyngeal air column to the left at the supraglottic level with normal prevertebral soft tissue thickening (Fig. 2). Computer tomography (CT) of the oral cavity and neck with contrast administration revealed a hypodensity mass with ring enhancement just beneath the right lateral pharyngeal mucosa. This was
compatible with abscess. It extended from the lower pole of the right tonsil and down to inner surface of epiglottis. Abscess was confined medially to hyoid bone (Fig. 3). The fatty tissue in the parapharyngeal space showed signs of inflammation and was displaced laterally without any evidence of abscess formation (Fig. 4). A right pharyngeal mucosal space abscess was diagnosed.

We planned intraoral incision and drainage under general anesthesia. Fiber optic-guided nasotracheal tube intubation failed due to massive swelling of the pharyngeal wall, which obscured vision of the larynx. In rapid sequence induction, endotracheal tubes (no. 7 and 6) could not be inserted. After many attempts of oral intubation, the abscess ruptured and pus drained into the pharyngeal lumen. Vital signs became unstable with bradycardia to 50/min and blood oxygen saturation ($\text{SpO}_2$) gradually dropped to 60-70%, and could not be corrected with oxygen mask ventilation. Emergency cricothyroidotomy was performed successfully, and an endotracheal tube (no. 6) was inserted through the incision. After re-oxygenation, $\text{SpO}_2$ climbed to 95-97%, and the pulse rate was within the normal range. Tracheotomy was performed, and the cricothyroidotomy incision was repaired. A Davis mouth gag was inserted and 2 cm-vertical incision along the right lateral pharyngeal wall was performed to drain the abscess. Yellowish, foul smelling pus (approximately 10 mL) was seen. Any drain (penrose, gauze) was not inserted.

![Fig. 1 Deviation of uvula (indicated by arrows), inflame right tonsil (indicated by black arrow heads), and swelling pharyngeal right pharyngeal wall (indicated by a curve dash line).](image1)

![Fig. 2 Deviation of air column to the left (indicated by arrows).](image2)
The patient recovered well after the operation. He was fully conscious with markedly decreased swelling of the right lateral pharyngeal wall and right tonsil. Pus cultured revealed *Streptococcus viridians* in aerobic culture and *Porphyromonas-Prevotella* group in anaerobic culture. Tracheotomy could be removed five days after operation, and the patient was discharged on oral antibiotics (Ampicillin/Clavulanate, 1 gm per oral twice a day) for 14 days.

**Discussion**

The pharyngeal mucosal space runs in a vertical plane from the skull base down to level of the hyoid bone [2-4]. Abscess in this space usually stays deep to the pharyngeal mucosa, and is bound laterally by buccopharyngeal fascia (see Fig. 5), which is a medial boundary of the parapharyngeal space. It is bordered posteriorly by the retropharyngeal space (see Fig. 6). Thus, the pharyngeal mucosal space only has fascia on the posterior and lateral margin by the...
middle layer of deep cervical fascia. It has only mucosa on medial margin. Most otolaryngologists do not classify this space in the category of deep neck space infection. This space is only mentioned in some textbooks of otolaryngology.

![Image](image1.jpg)

**Fig. 5** Pharyngeal mucosal space (indicated by arrow heads). A: palatine tonsil, B: constrictor muscles and buccopharyngeal fascia.

![Image](image2.jpg)

**Fig. 6** Relationship of pharyngeal mucosal space (white shade area), parapharyngeal space (indicated by a white dashed area) and retropharyngeal space (indicated by a black dashed area).
The normal contents in the pharyngeal mucosal space are lymphoid tissue of the Waldeyer’s ring, minor salivary glands, superior and middle constrictor muscles, salpingopharyngeus muscle, and pharyngobasilar fascia [2, 3]. Infection from pharyngeal mucosa or Waldeyer’s ring, such as pharyngitis or tonsillitis, can spread into this space and cause abscess formation [2, 5, 6]. An abscess is confined just beneath the pharyngeal mucosa and medial to buccopharyngeal fascia. Inferiorly, the abscess will stay medial to the hyoid bone. This finding helps the physicians to distinguish the pharyngeal mucosal abscess from the other deep neck abscess, if the collection runs lateral to the hyoid bone. Due to intraluminal location of this space, dysphagia or upper airway obstruction can happen in addition to the common signs of inflammation (fever or leukocytosis).

In a case series report of the pharyngeal mucosal space abscesses [5], all patients had a history of prior infection at the pharyngeal mucosa, Waldeyer’s ring lymphoid tissue or history of traumatized mucosa (such as abrasion from foreign body). Cultures usually show mixed organisms (both aerobic and anaerobic) [1, 6, 7]. These are common in the oral cavity. This patient also started with a history of tonsillitis and then developed to the abscess.

In 2003, Skoulakis et al. [5] reported a case series of three patients with pharyngeal mucosal abscess that spontaneously drained into the pharynx and another case where aspiration was performed. All patients recover well without any complication. An attempt in our patient of endotracheal intubation led to the abscess rupture and loss of control of the airway that required surgical airway management. Conservative management with intravenous antibiotics seems to be a safer method. However, the exact location of the abscess must be confirmed by evaluating the adjacent space (such as retropharyngeal space and parapharyngeal space). If the abscess involves multiple spaces, surgical drainage will have to be performed. Other indications for surgical drainage include 1) patient shows no response to antibiotics, 2) immunocompromise host, and 3) complications (e.g. airway obstruction, multiple space involvement). Tracheotomy under local anesthesia or awaked fiberoptic-assisted intubation with standby cricothyroidotomy/tracheotomy may be indicated. Laryngeal mask ventilation is contraindicated due to distortion of the upper airway anatomy. Drainage incision can be easily made on pharyngeal mucosa, starting from the level just below the inferior pole of the tonsil. In this patient, the author made a 2-cm vertically incision, and found it adequate for drainage. Incision healed within a day without any scar or fistula.

Conclusion

Pharyngeal mucosal space abscess is a very rare complication after Waldayer’s ring infection especially the palatine tonsils. Swelling of the pharyngeal wall may cause compressive symptoms such as odynophagia, dysphagia and upper airway obstruction that narrow the upper airway passage. Due to the rarity of this condition, no standard treatment protocol has been established. Conservative management with intravenous antibiotics or pus aspiration also has a high level of success with minimal morbidity. Surgical drainage can be done in case of failure of conservative treatment. Surgeons and anesthesiologist must be aware of fatal airway complications during intubation. Fiber optic-guided intubation is recommended and surgical team should be prepared for emergency surgical airway management if indicated. Vertical incision on the pharyngeal mucosa provides adequate opening for pus drainage and heals without any scar formation within days.

The author has no conflict of interest to declare.

Reference