

Emergency airway management of patients with peritonsillar abscess

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Introduction

Peritonsillar abscess (PTA) is a complication of acute tonsillitis and is considered as potentially life-threatening due to airway compromise [1]. When untreated, it spreads along the deep fascial planes of the neck and causes serious airway management problems, such as precipitating upper airway obstruction and difficult intubation [2]. Data of 11 adult patients with a diagnosis of PTA who underwent emergency incision/drainage or abscess tonsillectomy under general anesthesia between May 1998 and January 2002 at our institution were retrieved and analyzed. The results of computerized tomography (CT) scan and magnetic resonance imaging (MRI) studies were also retrieved and correlated with the airway management performed. In this study, we report our experience of 4 PTA patients with difficult airways over the last 4 years.

Case 1

A 56-year-old woman was transferred to our hospital with the diagnosis of PTA. She had a 7-day history of facial swelling and fever, and had become unable to swallow in spite of antibiotic administration. Her previous medical history was remarkable for untreated diabetes mellitus. The symptoms at the time of presentation were severe facial swelling and limitation of

mouth opening (1 cm), tachypnea, and dehydration. The laboratory data showed elevated hemoglobin A_{1c} level (8.8%), hyperglycemia (409 mg·dl⁻¹), and decreased serum sodium (131 mEq·l) and potassium (2.5 mEq·l) levels. Arterial blood sampling confirmed diabetic ketoacidosis (pH 7.24; P_{CO₂} 10 mmHg; base excess -20 mEq·l). CT scan showed the largest abscess collection and air density in the right parapharyngeal space at the maxillary level (Fig. 1). A central venous catheter was inserted via the right femoral vein, and administration of normal saline, regular insulin, and potassium was started to correct the presenting diabetic ketoacidosis and associated hypovolemia and electrolyte abnormality. The ear-nose-throat (ENT) surgeon requested general anesthesia to perform an incision/drainage procedure immediately. Because a difficult airway was predicted, a decision was made to secure the airway through fiberoptic-assisted nasotracheal intubation prior to the induction of general anesthesia. In the operating room, after sedation with 0.1 mg fentanyl i.v., a 6-mm bronchofiberscope was placed into the trachea through the nose, and a 7-mm tracheal tube mounted on it was successfully passed through the glottis. This was followed by propofol-fentanyl infusion and nitrous oxide-oxygen mixture inhalation, and incision/drainage was performed by the ENT surgeons.

Case 2

A 62-year-old woman with a 5-day history of sore throat and difficulty in swallowing was admitted for increasing dysphagia. Her presenting symptoms were severe facial swelling and limitation of mouth opening (1 cm). CT scan demonstrated the largest abscess formation in the left parapharyngeal space at the maxillary level (Fig. 2). As in the previous patient, limitation of mouth opening and difficulty in mask-bag ventilation necessitated fiberoptic nasotracheal intubation with the patient in an

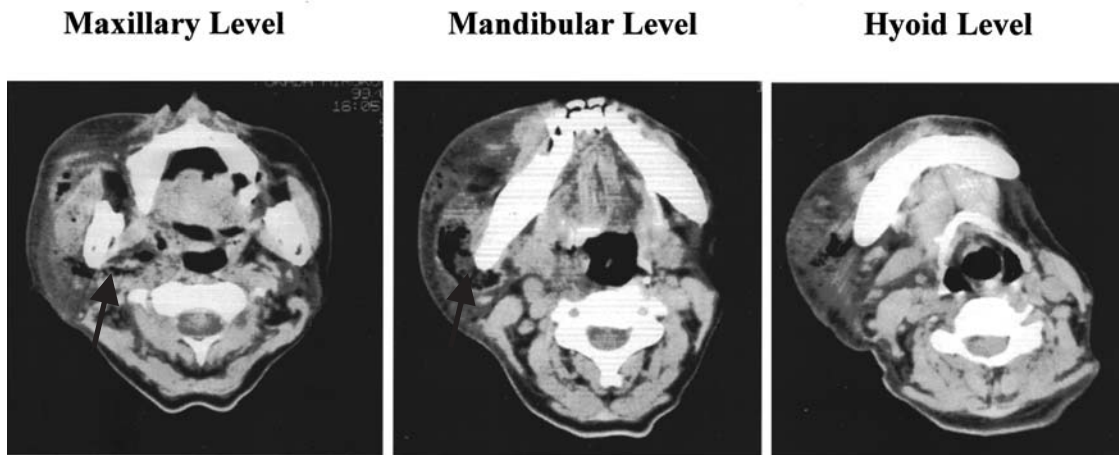


Fig. 1. Computerized tomography (CT) scan findings of case 1. Abscess collection extends from the mesopharynx to facial subcutaneous tissue (*arrows*). Air density is also found in the abscess

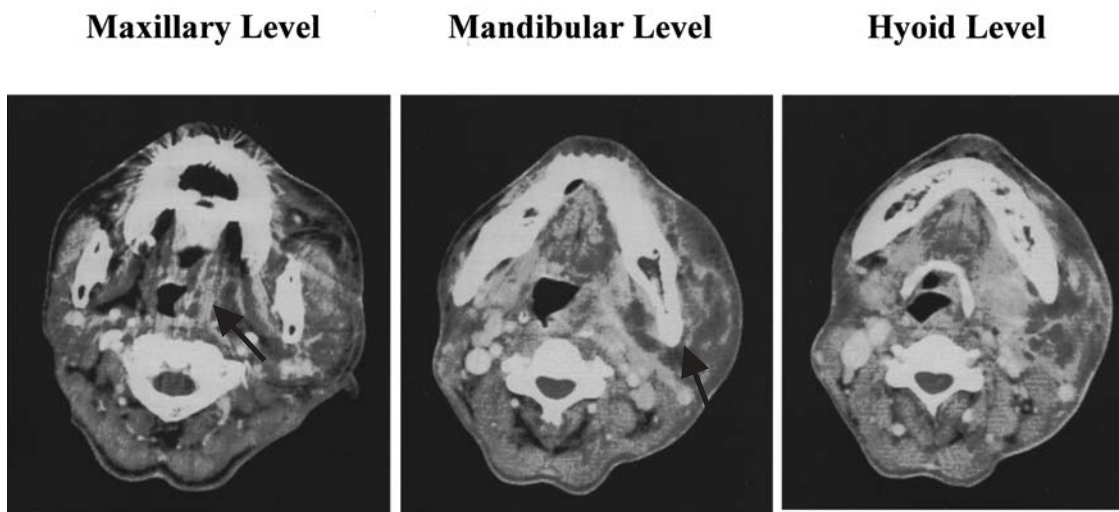


Fig. 2. CT scan findings of case 2. Abscess collection extends from the mesopharynx to facial subcutaneous tissue (*arrows*)

awake state. Induction and maintenance of anesthesia, and the surgical procedure performed, were similar to case 1.

Case 3

A 56-year-old man with PTA and diabetes mellitus was transferred to our hospital because of increasing dyspnea. At the time of presentation, mouth opening was severely limited (1 cm) and fiberoptic laryngoscopy, performed by an otolaryngologist, showed glottic edema. MRI studies also demonstrated abscess in the left and posterior parapharyngeal spaces, extending from the mandibular to the laryngeal level, which considerably decreased the airway space (Fig. 3). Because of the progression of symptoms and signs of upper air-

way obstruction, a decision was made to secure the airway by fiberoptic-assisted tracheal intubation with the patient in an awake state. After sedation with 0.1 mg fentanyl i.v., a 6-mm bronchofiberscope was placed into the trachea through the mouth, and a 7-mm tracheal tube was successfully slid over the fiberscope into the trachea. Abscess tonsillectomy and drainage procedures were subsequently performed with the patient under sevoflurane anesthesia with nitrous oxide-oxygen.

Case 4

A 56-year-old man with a 3-day history of sore throat was admitted to our hospital because of increasing dysphagia and dyspnea. On initial examination, glottic

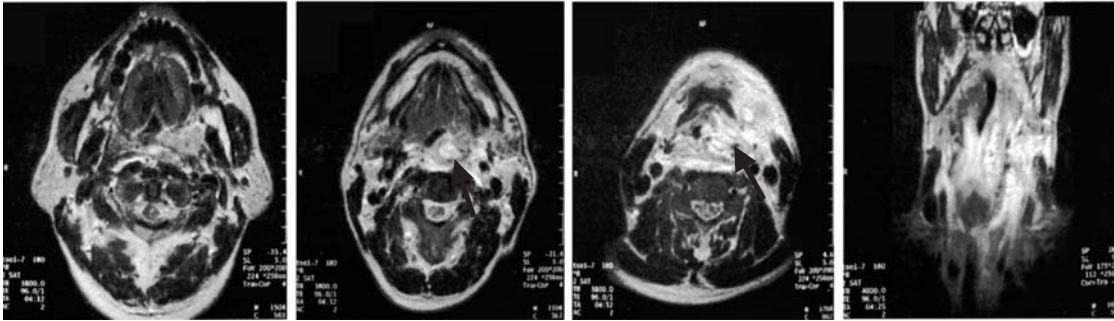
Transverse**Coronal****Maxillary Level****Mandibular Level****Laryngeal Level**

Fig. 3. Magnetic resonance imaging (MRI) findings of case 3. Abscess collection extends to the retropharyngeal space (*arrows*)

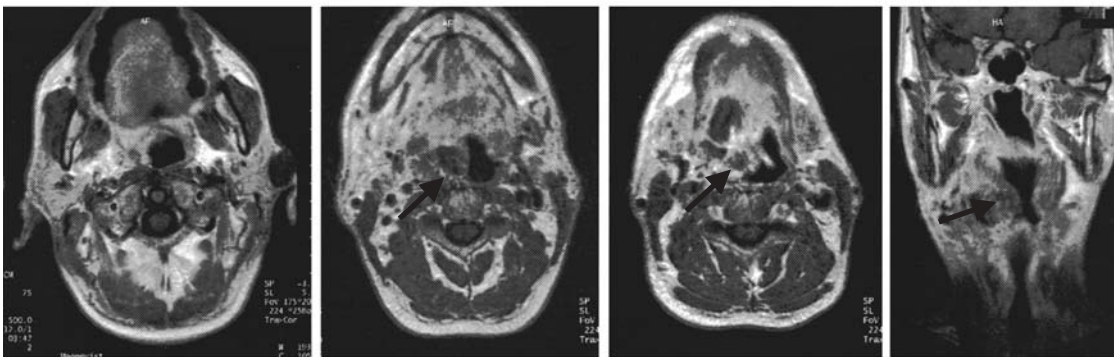
Transverse**Coronal****Maxillary Level****Mandibular Level****Laryngeal Level**

Fig. 4. MRI findings of case 4. Abscess collection extends to the supraglottic region (*arrows*)

edema was shown by fiberoptic laryngoscopy, and antibiotic administration was initiated. MRI studies demonstrated abscess in the right and anterior parapharyngeal spaces, extending from the mandibular to the laryngeal level, and the supraglottic airspace was decreased (Fig. 4). Although the administration of antibiotics markedly alleviated the signs and symptoms of upper airway obstruction, otolaryngologists decided to perform abscess tonsillectomy 2 days after the MRI study. After the induction of general anesthesia with fentanyl and propofol infusion, tracheal intubation was attempted with a rigid-blade laryngoscope. Because of the supraglottic swelling, however, direct laryngoscopy failed to visualize the larynx, and a subsequent attempt was made, successfully, with fiberoptic-assisted intubation. This was followed by abscess tonsillectomy.

Discussion

In 4 out of the 11 patients with PTA, the abscess extension compromised the airway to such a degree that tracheal intubation by fiberoptic bronchoscopy was necessitated, instead of conventional direct laryngoscopy. In 2 of the patients described here, cephalad spread of the abscess caused severe facial swelling and resulting limitation of mask fit and mouth opening. CT scans revealed the largest abscess collection to be at the maxillary level. In the other 2 patients, CT scan and MRI studies showed the largest abscess to be at the mandibular and hyoid level. Although facial swelling and limitation of mouth opening was less severe than in the former 2 patients, the caudal spread of the abscess led to precipitating upper airway obstruction.

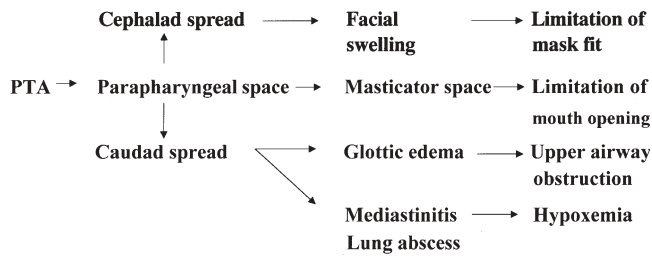


Fig. 5. Peritonsillar abscess (PTA) extension and associated airway compromise

In the preoperative assessment of PTA patients with airway compromise, it is often a challenge for anesthesiologists to decide whether to intubate when the patient is awake or after anesthesia induction. This decision is usually made in view of the presenting airway problems, which, in the patients reported here, seemed to be different according to the abscess extension. Cephalad spread of the abscess caused severe limitation of mask fit and mouth opening, whereas caudal spread led to precipitating upper airway obstruction. Mediastinitis and lung abscess have also been reported with caudal spread (Fig. 5). Besides the clinical signs and symptoms, CT scan and MRI studies provided additional information on the extent of abscess spread and airway compromise [3].

In our PTA patients, difficult airways were successfully managed with fiberoptic bronchoscopy. Awake fiberoptic nasotracheal intubation is an ideal method of choice for PTA patients with limited mask fit and mouth opening. In contrast, it is not uncommon that glottic

edema prevents the placement of a 7-mm or larger-sized tracheal tube and necessitates the use of a smaller bronchofiberscope in patients with precipitating upper airway obstruction. Abundant secretions tend to obscure the view of a smaller bronchofiberscope and make fiberoptic bronchoscopy extremely difficult in such cases. To get a better view of the larynx, awake direct laryngoscopy, using a conventional rigid laryngoscope blade, may be preferred, especially when the patients are cooperative. If the glottic opening cannot be seen, retrograde wire intubation or surgical airway should be considered immediately.

In conclusion, airway compromise in patients with peritonsillar abscess was found to differ according to the abscess extension. Cephalad spread of the abscess tended to cause severe limitation of mask fit and mouth opening, whereas caudal spread led to precipitating upper airway obstruction. Such difficult airways were successfully secured through fiberoptic bronchoscopy. Besides the clinical signs and symptoms, CT scan and MRI studies provided additional information on the extent of abscess spread and airway compromise.

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