

Case Report

Acute Epiglottitis: A Report of the Two Different Methods of Airway Management in Adults

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The authors present two cases of acute epiglottitis with upper airway obstruction that urgently needed artificial airways. In case 1, a 55-year-old woman with DM presented with severe upper airway obstruction and sepsis. The tracheostomy was chosen for airway management, antibiotic was given, and fluid and inotropic drug (dopamine) were used for cardiovascular support. She received continuing care in the intensive care unit for several days. In case 2, a 40-year-old man presented with acute airway obstruction when he breathed forcefully. The prophylaxis tracheal intubation was done by using sevoflurane inhalation. The life-threatening situations of both patients were managed successfully by the team approach of ENT surgeons, anesthesiologists, and intensivists.

Keywords: Epiglottitis, Airway obstruction, Inhalation induction, Tracheostomy

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Acute epiglottitis is a serious infection that can cause lethal airway obstruction. This disease is increasing in adults⁽¹⁾. Although in Thailand, the vaccination for H. Influenzae is not often provided, the incidence in children has declined. The authors would like to report two adult cases of acute epiglottitis that were managed differently.

Case Report

Case 1

A 55-yr-old woman with a history of DM was brought to the emergency room due to breathing difficulty. She had symptoms of sore throat, fever, muffled voice, and progressive neck swelling for the last 5 days. Her first vital signs were T 37.2°C, PR 110/min, RR 30/min, BP 140/80 mmHg. She was agitated and confused with respiratory distress, and inspiratory and expiratory stridors were heard. Her room air oxygen saturation was 67% and was improved to 98% with

an oxygen mask with bag having a high oxygen flow rate of 15 L/min. She had neck lymphadenopathy and soft tissue infection. The laboratories revealed Hct 28%, wbc 12,400/ μ L, PMN 82%, Platelet count 128,000/ mm^3 , blood sugar 19.4 mmol/L, and creatinine 0.8 mg%, Na 128, K 4.1, Cl 99, and HCO_3 27 mmol/L. Lateral neck: x-rays showed swelling epiglottitis (thumb's sign). Her diagnosis was acute epiglottitis with upper airway obstruction. In the theatre, the tracheostomy was performed in the semi-sitting position under local anesthesia and monitored anesthesia care. Immediately after tracheostomy, which took about 15 minutes, her systolic blood pressure dropped to below 80 mmHg. The intravenous fluid was loaded and dopamine infusion was started. A lot of secretion came out of the tracheostomy tube. The oxygen saturation was maintained above 90% with intermittent positive pressure ventilation and 100% O_2 . The patient was transferred to the intensive care unit. In the ICU, the CXR was compatible with non-cardiogenic pulmonary edema and the ARDS was diagnosed. The hemoculture was taken and the antibiotic (cefotaxime) was started. The blood culture was positive for K. pneumonia (the result reported five days later). She required inotropic support for 2 days and discontinued from the ventila-

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tor 1 week later. She had been admitted to the hospital for 23 days before being discharged.

Case 2

A previously healthy 40 yr-old man apart from being a heavy smoker was seen in the emergency room due to fever and sore throat for 3 days, with swallowing and breathing difficulty for 1 day. His vital signs were T 37.8°C, PR 78/min, BP 105/90 mmHg, RR 20/min, and room air oxygen saturation was 98%. He was conscious and preferred sitting as he could not breathe well when lying down. Lateral neck: x-rays showed swelling epiglottis, thumb's sign positive, normal air column, and normal prevertebral soft tissue (Fig. 1). He was transferred to the operating theatre for prophylactic tracheal intubation. At the operating room, he was extremely anxious and had inspiratory stridor only when he tried to breathe forcefully. The flexible nasopharyngoscopy, which was done under topical anesthesia, showed markedly swelling of the epiglottis and arytenoids but glottis was visible (Fig. 2). The awake intubation under topical anesthesia was the first plan but denied by the patient. Anesthesia was induced by mask inhalation with sevoflurane (titrated up to 8%) in 100% oxygen in the semi-sitting position. The micro-laryngeal tube (Mallinckrodt MLT tube 5.0 I.D.) with stylet was inserted successfully in the first attempt. The laryngoscopic view was grade 3b (Epiglottis and arytenoids were seen). Flexible laryngoscopy was performed by the ENT surgeon to look at the surrounding structures of epiglottis. No other surrounding soft tissue infection was found. Then the tube size, estimated by ENT surgeon, was changed to Portex 6.5 ID (standard low pressure, high volume cuff) via tube exchanger. Blood culture was taken and cloxacillin was started. A few minutes later, he was awake and slightly confused and tried to extubate himself. Two miligram of midazolam was given which made him calm and cooperative. The significance of endotracheal tube was explained again. He was sent back to the ENT ward with supplementary oxygen through the endotracheal tube. The mechanical ventilation was not required but intermittent transtracheal suction was needed. He remained intubated for 2 days and was extubated in the operating theatre after re-examination with flexible laryngoscopy. The total length of hospital stay was 5 days.

Discussion

Airway management in acute epiglottitis with upper airway obstruction is one of the greatest

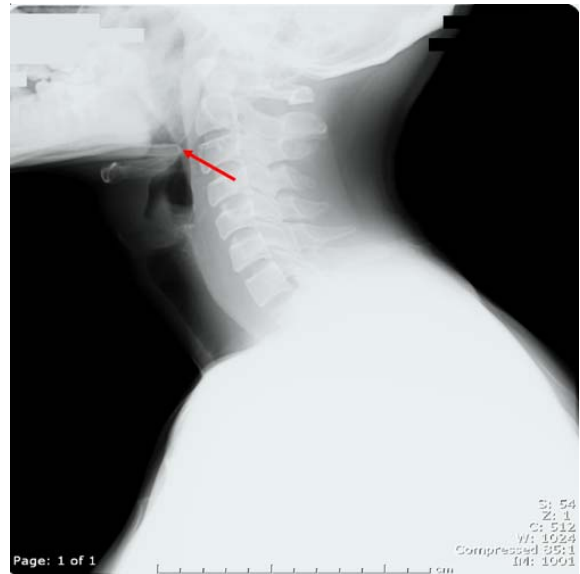


Fig. 1 Lateral neck x-rays: swollen epiglottis (thumb sign)

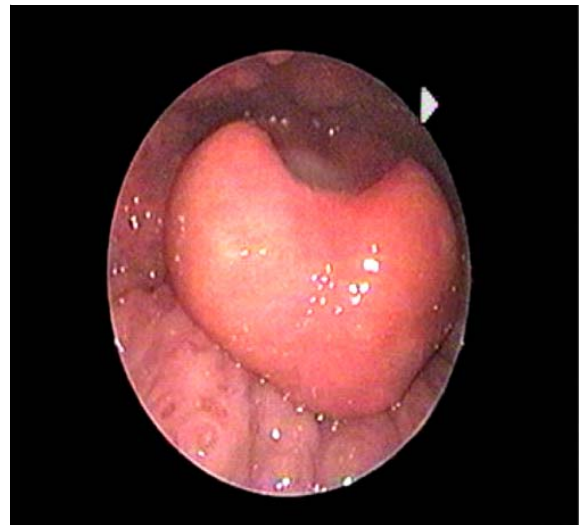


Fig. 2 Picture from flexible laryngoscopy showed swollen epiglottis

challenges for anesthetists because difficult intubation is expected. The failure to secure the airway can be fatal. Several airway managements can be used such as awake intubation (in a cooperating patient), inhalation induction (in an uncooperative patient) or tracheostomy (in severe obstruction or failed intubation). The awake intubation with fiber optic or direct laryngoscopy can be attempted in awake, cooperative, and

tolerant patients. Morbidity from the awake intubation may result from inadequate topical anesthesia, injudicious use of sedation, difficulties and time-consuming process⁽¹⁾. Ovassapian et al reported a very high success rate (25 from 26 patients) that was attributed to a well-organized approach and expertise in flexible bronchoscope⁽²⁾. The patient in case 1 was severely agitated and the patient in case 2 was un-cooperative.

Tracheostomy was chosen as an airway management in case 1 for several reasons. Firstly, a large soft tissue inflammation and oedema added up to acute epiglottitis. Secondly, the patients had symptoms and signs of sepsis syndrome and may need prolonged mechanical ventilation and the early tracheostomy could facilitate early weaning. Although most patients with deep neck infection can be intubated successfully, in an advanced case, the induction of general anesthesia even with inhalation may precipitate complete airway closure and become impossible for ventilation and intubation, and necessitate emergency tracheostomy⁽²⁾. The anesthesia care monitor was provided and it was not surprising that severe hypotension was encountered after successful tracheostomy. The hypotension after emergency re-intubation frequently occurred (35%)⁽³⁾. Hypotension can result from: (1) a severely dehydrated patient who cannot take enough oral fluid for several days, (2) septic shock, (3) lower levels of catecholamine, elevated because of hypoxemia or hypercarbia, and (4) intermittent positive pressure ventilation. The hypotension responded to fluid and inotropic (dopamine) support. The antibiotic was given for the coverage of *H. influenza*, which is the most common causative pathogen until her microbiology report proved otherwise (*K. pneumonia*). This patient needed intensive care several days because of sepsis. Her DM might make the infection more severe but finally she could return home safely after 23 days.

In case 2, although the prophylaxis intubation is not routinely necessary, the developing dyspnoea is a strong predictor for the need of intubation⁽⁴⁾. The fiber optic laryngoscopy under topical anesthesia helped the anesthesiologist and ENT surgeon to choose the appropriate airway management in this patient. The inhalation induction was used with success but not without potential risks. Inhalation is slow and difficult in the presence of upper airway obstruction. The respiratory depression, hypotension, or apnoea occurs sometimes and can deteriorate a compromised airway^(5,6). Spontaneous ventilation can be preserved with slow increasing of sevoflurane con-

centration and when the patient is in the deep plane of anesthesia (eyes are in the middle, slower heart rate, mild hypotension) and the intubation can be accomplished by an experienced anesthetist. Sevoflurane has a low blood gas partition coefficient (0.6) which makes the inhalation induction quicker compared with halothane and less arrhythmogenic effect, which can be advantageous in patients with high catecholamine levels. On the other hand, sevoflurane's low solubility provides a good intubating condition in limited time because the anesthesia is inadequate after a few minutes of discontinuing sevoflurane. A small microlaryngeal tube makes it easier to be inserted through the narrow airway. The microlaryngeal tube with a high volume and low pressure cuff is frequently used for the airway surgery because it is small and long (5 mm x 31 cm) and not obscuring the view of the larynx⁽⁷⁾. The tube exchanger is also very useful for changing a smaller tube (5.0 ID) to a larger one (6.5 ID). The appropriate size of the orotracheal tube was estimated by flexible fiber optic laryngoscopy that was done after the first intubation. This patient was extubated two days later after his epiglottis was re-evaluated and found that the swelling was greatly improved.

In summary, inhalation induction and intubation or tracheostomy both can be used successfully for airway management. Inhalation induction and intubation can be used in less severe situations for airway obstruction; tracheostomy can be used if the intubation fails or in a case of very severe airway obstruction.

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ฝากล่องเสียงอักเสบ: การเปิดทางหายใจ 2 แบบ

มานี รักษาเกียรติศักดิ์, จีระสุข จงกลวัฒนา

ผู้ป่วย 2 รายได้รับการวินิจฉัยว่าเป็น ฝากล่องเสียงอักเสบ (acute epiglottitis) ร่วมกับทางหายใจส่วนบนตีบแคบ ผู้ป่วยรายที่ 1 หญิงอายุ 55 ปีเป็นเบาหวาน มีทางหายใจส่วนบนตีบแคบอย่างมากและการติดเชื้อรุนแรง ผู้ป่วยได้รับการเจาะคอ (tracheostomy) เพื่อใช้เป็นทางหายใจและได้รับสารน้ำและยาสำหรับรักษาภาวะความดันเลือดต่ำ และได้รับการรักษาต่อเนื่องในหอผู้ป่วยวิกฤติ ผู้ป่วยรายที่ 2 ชายอายุ 40 ปี มีทางหายใจส่วนบนตีบแคบ เวลาหายใจแรง การใส่ท่อช่วยหายใจผ่านทางปาก (oral endotracheal tube) เป็นทางเลือกในรายนี้ ซึ่งทำโดยการสูดนำสลบด้วย sevoflurane การดูแลผู้ป่วยทั้งสองรายประสบความสำเร็จโดยความร่วมมือของแพทย์โสต นาสิก ลาริงซ์ วิทยุณีแพทย์ และแพทย์ที่ดูแลผู้ป่วยในหอผู้ป่วยวิกฤติ