Conservative management of a 13-year-old boy with postintubation tracheal injury

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Injuries to the trachea can occur in the event of accidental trauma or complications from various medical procedures. Postintubation tracheal injury can be a critical issue; it needs to be recognized as soon as possible because it can be life threatening. The mortality rate of postintubation tracheal injury is as high as 22%.1 Management has traditionally consisted of surgery, but more and more case reports describe successful recovery after a course of conservative treatment.

We present the case of a 13-year-old boy who was transferred to our pediatric intensive care unit with progressive subcutaneous emphysema after emergent endotracheal intubation. This patient was found cyanotic and unconscious in his bed at home. His mother started chest compression at the behest of an emergency medical technician over the phone. The boy had pulseless ventricular tachycardia and ventricular fibrillation during transportation and received endotracheal intubation immediately. After 40 minutes of cardiopulmonary resuscitation, he regained spontaneous circulation. Progressive subcutaneous emphysema was palpable from neck to trunk, and the sound of the boy’s breathing was subdued on his right side. A computed tomography scan showed a pouch-like lesion with rupture at the right side of the middle to lower part of his trachea, as well as subcutaneous emphysema, pneumothorax, and pneumomediastinum (Fig. 1A). Fiberoptic bronchoscopy revealed the same findings (Fig. 1B). The injury to the trachea may have been attributable to intubation. The air leak syndrome gradually subsided under mechanical ventilation support, chest tube thoracotomy, and 100% oxygen inhalation. The boy had a second bout of hypoxic-ischemic encephalopathy due to prolonged resuscitation. He received a tracheostomy and was then transferred to a respiratory care center for long-term care.

Iatrogenic tracheal injury is a rare but possibly fatal complication. In a nationwide survey, 604 cases of iatrogenic tracheal injury were enrolled both from medical centers and regional hospitals. The most frequent etiologies were intubation and dilative tracheostomy.2 Among patients receiving intubation, the most common location of the rupture/laceration lesion was at the posterior wall of the lower third part of the trachea. The mechanisms that cause injury during intubation include overinflation of endotracheal tube cuffs, malpositioning, replacement without deflation of the cuff, improper use of stylets, inappropriate tube size, and multiple intubation attempts in emergency cases; preexisting anatomical abnormalities can also contribute to injury.1,3 Early surgical repair is traditionally considered the treatment of choice in the event of injury to the trachea. Other indications for surgical intervention are mediastinitis, concurrent esophageal lesion, sepsis, or mediastinal tissue obstruction of the tracheal lumen.4 Conservative treatment
has been proposed for selected patients with a tracheal injury and for those with other underlying conditions for which surgery is deemed inappropriate. Beiderlinden et al in 2005 reported five patients of tracheal injury who recovered without surgical intervention within several weeks in a university hospital. In our case, the patient recovered well from his tracheal injury through conservative management, confirming the previous results outlined above.

A tracheal injury that occurs during an emergency procedure may result in more difficult airway management and cause a life-threatening event, especially in children. Flexible bronchoscopy can be used as an immediate diagnostic tool followed by further computed tomography scan imaging to rule out other pulmonary diseases. In conclusion, conservative treatment may be the best treatment method.

References


Figure 1 Imaging of computed tomography scan and fiberoptic bronchoscopy. (A) Chest computed tomography scan showing a pouch-like lesion (arrows) at the right side of the middle to lower trachea with rupture and subcutaneous emphysema (arrowheads). (B) The pouch-like lesion (arrows) as seen in fiberoptic bronchoscopy.