

Abstract:

Pediatric laryngotracheal injuries as a result of blunt neck trauma are exceedingly rare, but they have the potential for fatal consequences if not identified and managed appropriately. Two cases on the spectrum of laryngotracheal trauma are presented followed by an overview of pediatric laryngotracheal trauma with a focus on acute airway management. Special considerations must be taken into account when evaluating and treating children with laryngotracheal injuries. Standard orotracheal intubation by direct laryngoscopy is risky, and awake tracheostomy is often not feasible. Flexible or rigid bronchoscopic airway management is the preferred method of tracheal intubation prior to tracheostomy. The airway surgeon must be prepared to perform an efficient, emergency tracheostomy. In stable patients, flexible fiberoptic laryngoscopy is an important diagnostic tool in the evaluation of laryngotracheal injuries. After ensuring a secure airway, further goals of management are aimed at preserving normal laryngeal function: airway patency, voice, and swallowing.

Keywords:

pediatric blunt neck trauma;
laryngeal trauma; tracheal trauma;
tracheostomy

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Emergency Airway Management for Pediatric Blunt Neck Trauma

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Laryngotracheal injuries as a result of blunt neck trauma are exceedingly rare in children, but they have the potential for fatal consequences if not identified and managed appropriately. Two cases within the spectrum of laryngotracheal injuries are presented followed by an overview of pediatric laryngotracheal trauma with a focus on acute airway management.

CASE 1

A 17-year-old boy presented to the emergency department with chest and neck pain, dysphonia, and mild dyspnea after sustaining a fall from a 20-ft jump while snowboarding. The patient cracked his helmet during the fall, and he had a loss of consciousness. Upon arrival to the emergency department, advanced trauma life support (ATLS) protocol was followed, and he was in no acute distress, breathing comfortably on room air without any stridor; his voice, however, was hoarse. He had bilateral neck crepitus, and his laryngeal landmarks were normal to palpation without any step-offs. A bedside flexible fiberoptic laryngoscopy (FFL) was performed and identified mild supraglottic edema, mobile vocal cords, no visible lacerations or hematomas, and no exposed

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cartilage. A computed tomography (CT) scan was then obtained. The CT showed cervical and mediastinal subcutaneous air but no laryngeal fractures or other lesions (Figure 1).

The decision was made to closely observe the patient in the intensive care unit with serial examinations and plain film radiographs to assess for progression or resolution of his subcutaneous emphysema. Prior to initiating a diet, an esophagram was obtained, which showed a normal result. The patient continued to improve symptomatically, his cervical and mediastinal emphysema improved on examination and on chest x-ray, so he was discharged home. He was doing well at a 4-week follow-up appointment with a normal voice and no complaints.

CASE 2

A 6-year-old boy was riding a bicycle and fell, landing with his anterior neck onto the handlebars



Figure 1. Axial CT scan on the cervical spine without contrast at the level of the thyroid cartilage showing cervical emphysema in the deep soft tissues of the neck.

with significant force. He initially developed some difficulty breathing, and his neck and chest skin started to swell. His family took him to the nearest emergency department where ATLS protocol was followed, and he was sent by helicopter to a tertiary care children's hospital with a cervical collar in place. He was evaluated immediately by the trauma service and was deemed to be clinically stable. Flexible fiberoptic laryngoscopy was performed by the pediatric otolaryngology service showing no laryngeal injury and normal vocal cord function. He had a normal voice, and crepitus of the neck and chest was present on physical examination. A CT scan of the neck and chest was obtained showing a traumatic tracheoesophageal fistula (Figure 2).

A rigid bronchoscopy was performed showing a 4-cm linear tear in the posterior membranous trachea. Rigid esophagoscopy confirmed that it extended through into the anterior wall of the esophagus. The patient was intubated in a controlled manner, and a tracheostomy was performed. The vertical tracheostomy incision was extended to allow for complete visualization of the traumatic posterior tracheoesophageal injury. A multilayered closure of both the esophageal and tracheal sides was performed with absorbable suture. The tracheostomy tube was placed at the inferior most portion of the anterior tracheal incision, and the superior portion of tracheal rings was closed in the midline with absorbable suture. Postoperative esophagram showed no evidence of esophageal leak, and oral feeding was begun on postoperative day (POD) 7. He was discharged home with a downsized tracheostomy tube on POD 9. Serial bronchoscopy was performed weekly to debride intraluminal granulation tissue, and decannulation was performed on

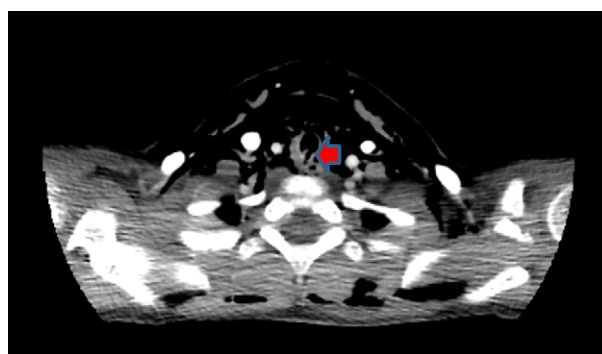


Figure 2. Axial CT scan of neck with contrast, which was suspicious for a tear through the posterior wall of the trachea into the anterior wall of esophagus. This was confirmed intraoperatively by endoscopy, noted to be 4 cm in length. Diffuse cervical emphysema was also present.

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