



Management of subcutaneous emphysema due to penetrating oropharyngeal trauma

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Abstract

Penetrating trauma to the oropharynx is a rare problem in children. Although the majority of cases heal with no long-term consequences, it they can result in fatal complications. In this case report we discuss how a spoon-related oropharyngeal trauma case was treated. We discuss how a spoon-related oropharyngeal trauma case was treated in this case report. A 7-year-old boy fell facedown when eating ice cream, and the spoon became stuck in his throat. A vertical 3-4 cm laceration in the midline of the posterior wall of the pharynx was discovered. There was subcutaneous and retropharyngeal air values extending into the upper mediastinum in his computed tomography scan. His computed tomography scan showed subcutaneous and retropharyngeal air values extending into the upper mediastinum. The patient was intubated and monitored in the pediatric intensive care unit. To prevent infection problems, broad-spectrum antibiotics were started. He was successfully extubated as his subcutaneous emphysema regressed. In penetrating trauma of the oropharynx to avoid fatal complications, early administration of antibiotic therapy, and close monitoring of the in the intensive care unit is vital.

Keywords: oropharynx, pneumomediastinum, emphysema, trauma

1. Introduction

Foreign body cases are commonly present in otolaryngology practice, particularly in the pediatric age group. It is more common in boys, and a male/female ratio of 3:1 has been documented (1). Lethal complications such as subcutaneous emphysema, deep neck infection, pneumomediastinum, pneumopericardium, carotid artery thrombosis, and mediastinitis can occur due to these injuries (1, 2). While the soft palate and tonsils are more commonly affected in penetrating pharyngeal injuries, the hard palate, tongue, and posterior oropharynx are less frequently involved (3). This case presentation discusses a case of spoon-related posterior pharyngeal wall injury and its management.

2. Case Report

A previously healthy male patient, aged 7, fell off a chair while holding a metal spoon. The mother removed the spoon stuck in the child's mouth, which resulted in bleeding and coughing. The pediatricians and otolaryngologists evaluated the patient who presented to the emergency room. In the first examination, there was an ecchymotic look and laceration on the posterior pharyngeal wall and soft palate. Flexible fiberoptic endoscopic inspection revealed a vertical 3-4 cm lacerated area on the oropharynx's posterior wall with no evidence of respiratory distress. During transnasal fiberoptic endoscopic examination, salivary pooling in the pyriform sinuses was identified. CT

scan of the neck demonstrated diffuse free air values from the retropharyngeal area to the anterior mediastinum.

In addition, although we observed air values in the left carotid sheath, no signs of vascular injury were observed in angiography. We continued the patient's oral intake and administered ceftriaxone and paracetamol. The patient was unable to swallow secretions, and his oxygen saturation declined to 85%. We planned an emergency tracheotomy in the event of upper airway edema. A previously undetected subcutaneous emphysema in the patient's submandibular region and anterior thoracic wall was found. We used a syringe to drain subcutaneous emphysema. In the presence of imminent respiratory failure, we performed elective endotracheal intubation using direct laryngoscopy without incident. The child was transported to the pediatric intensive care unit and placed on mechanical ventilation. On the first day of his hospitalization, he had a fever, and we added metronidazole to his regimen to prevent mediastinitis. Because of the persistent fever, we changed the treatment regimen to piperacillin-tazobactam, teicoplanin, and fluconazole. On the third day of hospitalization, we performed a neck ultrasound to examine for a possible deep neck infection and found heterogeneous fluid values around the thyroid gland. On the fifth day of his hospitalization, the patient was extubated and

transferred to a high-flow nasal cannula. We administered dexamethasone to alleviate airway edema. On the seventh day, we started oral feeding, and the patient no longer required oxygen. We examined the patient in service conditions the same day after a significant regression in pneumomediastinum. Observing a deep neck infection on the control tomography, we transferred the patient to the ward. He was discharged on the 17th day with no additional problems detected in the second week and second-month follow-ups following discharge.

We obtained informed consent from the family for this case presentation.



Fig. 1. The traumatic region at posterior oropharynx (A) and subcutaneous emphysema at axial (B) and sagittal (C) sections of neck CT.

3. Discussion

Penetrating pharyngeal injuries are most common in children who fall prone with a foreign body in their mouth. Toothbrushes, pencils, cylindrical toys, and straws are the most common foreign bodies that cause penetrating pharyngeal injuries (3). Although serious sequelae from penetrating pharyngeal injuries are uncommon, some occurrences might result in severe morbidity and mortality. Potentially serious complications include carotid artery injury, neurological sequelae from thrombosis, sepsis, shock, cervical emphysema, pneumothorax, and pneumomediastinum (4).

Because the posterior wall of the pharynx is susceptible, subcutaneous emphysema in the head and neck region can be noticed with a shift in pressure balance following a penetrating injury, especially in children. Air collection in the subcutaneous tissues can also be observed due to the colonization of the subcutaneous area by various gas-producing bacteria (5).

Following pharyngeal mucosal injury, air can enter the tissue between the pharyngeal constrictor muscles and then into the parapharyngeal and retropharyngeal spaces. It may extend superiorly to the submandibular and sublingual areas, advanced zygomatic arches, and retro auricular regions. Second, the air in the retropharyngeal area may move superiorly at the skull base from the prevertebral fascia and the visceral layer of the deep cervical fascia to the posterior mediastinum up to the level of the diaphragm posteroinferiorly. Third, it can spread from the deep cervical fascia's pretracheal layer to the hyoid bone, thorax, middle mediastinum, and pericardium (4).

Additionally, oropharyngeal flora infection within 24 hours, retropharyngeal abscess, and mediastinitis are among

the potentially fatal consequences. After admission, we detected subcutaneous emphysema, which then generated pneumomediastinum.

In these situations, targeted radiological imaging should be conducted. A posteroanterior and lateral X-ray is recommended if pneumomediastinum is suspected, while recommending a tomography if mediastinitis and deep neck infection are suspected. When a severe vascular injury is suspected, a CT-angiography should be ordered. Although surgical intervention may be required based on the location of the damage, its extent, and the presence of bleeding, a conservative approach is sufficient for most patients (6). First and foremost, airway safety and proper oxygen support are required. Oxygen support was insufficient in our case at the 10th hour of the trauma; thus, we intubated the patient and administered mechanical ventilator support. During intubation, tracheotomy preparation should be made. In patients with a secure airway, oral intake should be halted, and prophylactic broad-spectrum antibiotics and analgesics should be given and monitored for at least 72 hours (4-6). When a patient has a high fever and elevated inflammatory markers, the antibiotic spectrum should be broadened, and the patient should be assessed for deep neck infection and mediastinitis. A high index of suspicion, early antibiotic administration, and close monitoring of the patient's vital signs in the intensive care unit are crucial for managing these potentially lethal disorders. The dangers of oropharyngeal trauma must be clearly mentioned to parents and caregivers.

Conflict of interest

The authors declare there are no conflicts of interest—financial or otherwise—related to the material presented herein.

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All procedures performed in the case report were in accordance with the ethical standards of the Helsinki Declaration. We obtained informed consent from the parents of the patients included in the study.

Authors' contributions

Concept: E.T., N.Y.; Design: E.T., H.A.; Supervision: S.A.; Resource: E.T., N.Y.; Materials: E.T., H.A.; Data Collection and/or Processing: E.T., E.D.H.A.; Analysis and/or Interpretation: E.T., N.Y.; Literature Search: E.T.; Writing: E.T., H.A., E.D., N.Y., S.A.; Critical Reviews: S.A., N.Y.

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