

Delayed Diagnosis of Complete Tracheal Transection

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ABSTRACT

Tracheal injuries are relatively rare; however, their mortality rate is relatively high. Complete disruption of the trachea is extremely rare, and a systematic approach is required for early diagnosis and favorable outcomes. This is a case report of a 17-year-old male admitted to the emergency room after a motor vehicle accident. He was agitated and in respiratory distress with labored breathing and urgently intubated orotracheally. In the first flexible bronchoscopy, the diagnosis of the tracheal transection was missed. Due to saturation drop and high peak ventilator pressures on the seventh day, the flexible bronchoscopy examination was performed in the operating room. This measure revealed complete tracheal transection in midportion. Neck exploration demonstrated complete tracheal transection. The area was debrided, and primary end-to-end anastomosis was performed. The patient was extubated at the end of the surgery.

Introduction

Traumatic tracheal injury after blunt neck trauma is rare; however, most patients with complete tracheal transection usually expire at the scene due to loss of airway [1]. The few, who survive and admit to a hospital, pose a diagnostic and therapeutic challenge to the trauma team. If treated improperly, these patients may present fatal outcomes when misdiagnosed or encounter long-term complica-

tions. Diagnosis is usually obscure as the symptoms may not be directed towards the disease. Early diagnosis and treatment of tracheal injuries lead to the best outcome [2]. In this paper, our experience with one survivor of a complete tracheal transection caused by blunt trauma diagnosed after one week was reported.

Case Presentation

A 17-year-old male arrived in the emergency room after a motor vehicle accident. He was agitated and in

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respiratory distress with labored breathing and urgently intubated orotracheally. The vital signs included a blood pressure of 110/80 mmHg, a heart rate of 115 beats/min, and an axillary temperature of 36.4°C. The patient had crepitus on his neck and chest area. A supine chest radiograph detected Pneumomediastinum and subcutaneous emphysema (Figure 1). The Computed Tomography (CT) scan of the neck and chest revealed Pneumomediastinum, pulmonary contusion, and subcutaneous emphysema in the neck and chest (Figure 2). Because of concern for suspected tracheobronchial injury, a flexible fiberoptic bronchoscopy in the emergency room; however, no finding was observed in favor of tracheal injury, and tracheal transection was missed. During the one-week admission of the patient in the ICU, he occasionally had high peak ventilator pressures but saturated well. Due to saturation drop and high peak ventilator pressures on the seventh day, the flexible bronchoscopy examination was conducted in the operating room. This measure revealed complete tracheal transection in mid-portion (Figure 3). Neck exploration demonstrated complete tracheal transection. The area was debrided, and primary end-to-end anastomosis was performed. The patient was extubated at the end of the surgery. After one week, the patient was discharged.

Discussion

Complete tracheal transection in blunt cervical trauma is an uncommon occurrence. Tracheal injuries are life-threatening, with a mortality rate of 40%. Timely and proper airway management is life-saving [3]. Signs and symptoms may be subtle in tracheal injuries and relatively non-specific, correlating poorly with the severity

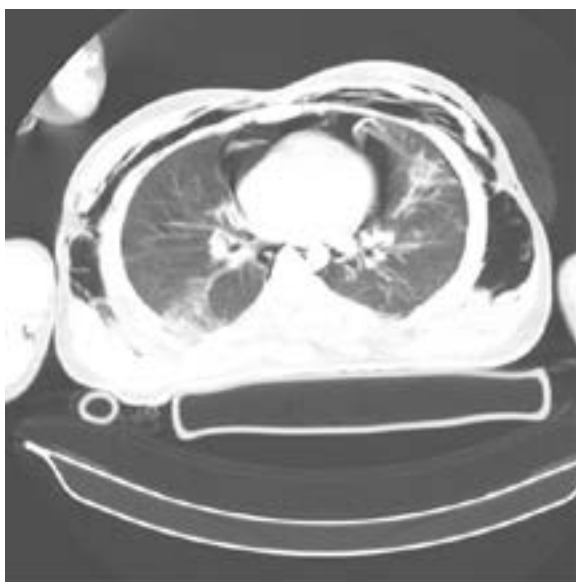


Figure 1. The supine chest radiograph showing pneumomediastinum and neck and chest subcutaneous emphysema

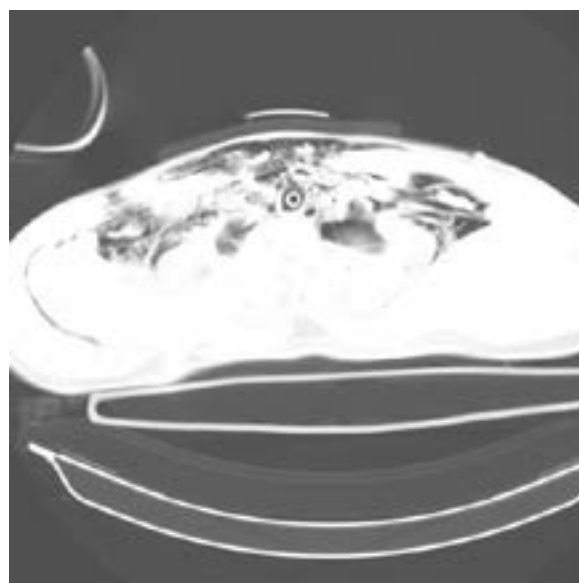
of the underlying injuries. Intact peritracheal tissue may provide a life-saving conduit for gas exchange through disruption [4]. The most common presentations are respiratory distress, dyspnea, poor gas exchange, and hemoptysis [5]. Cyanosis and serious respiratory embarrassment are present in 30% of the cases. Another common symptom is hoarseness or dysphonia, occurring in 46% of the patients [6]. The most common signs of airway injury reported in most series are subcutaneous emphysema (35%-85%), pneumothorax (20%-50%), and hemoptysis (14%-25%); however, the lack of specificity and the occult nature of the injury frequently result in a delayed diagnosis [7]. Deep cervical emphysema and Pneumomediastinum are observed in 60% of the patients with tracheobronchial injuries [6]. Multiple tracheobronchial injuries are not diagnosed immediately (25%-68%) [5]. Physicians need to maintain a high index of suspicion related to non-specific signs, such as dyspnea, cough, subcutaneous emphysema, and hemoptysis [8]. The mechanism of injury, vocal changes, and rapidly expanding subcutaneous emphysema in the neck are significant clues [8]. Clinical examination is followed by radiologic imaging, angiography, CT, and tracheobronchio-esophagoscopy [9]. Accurate interpretation of the chest radiograph is essential in the early diagnosis of the occult upper-airway injury. A CT scan can be performed if the diagnosis is uncertain on plain films [8].

Preoperative CT can be useful in assessing associated laryngeal injuries or other unsuspected chest injuries that should be managed at the time of surgical exploration. CT is contraindicated in hemodynamically unstable trauma patients or patients with unstable airways [6]. Helical CT with 3D reconstruction should be considered a practical screening test in a trauma patient suspected of tracheal rupture; it may help the clinician in the decision to perform bronchoscopy on the patient [7]. The best diagnostic investigation is bronchoscopy. Flexible bronchoscopy should be first performed to determine the location and extent of the injury [5].

Some reports agreed that there is a slight possibility that airway problems could be missed, and therefore repeat fiberoptic bronchoscopy follow-up should be performed if the clinical situation suggests an abnormality [10, 11]. The management principles include prompt airway establishment and immediate exploration of the wound with the appropriate investigation. Surgical repair is the treatment of choice for the tracheal transection that includes complete repair of the trachea with end to end anastomosis. Complete transection of the trachea should be managed by careful suturing and being cautious to avoid damage to the recurrent laryngeal nerves [12].



A



B



Figure 2. CT images

A: Image of the neck demonstrating subcutaneous emphysema; B: Image of the chest showing Pneumomediastinum, pulmonary contusion, and subcutaneous emphysema.

Conclusion

Complete tracheal transection in blunt trauma is an uncommon occurrence and life-threatening. Signs and symptoms may be subtle in tracheal injuries. This report presented a slight possibility that airway problems could be missed, and therefore repeat fiberoptic bron-

choscopy follow-up should be performed if the clinical situation suggests an abnormality. Timely diagnosis, skillful airway management, and prompt surgical repair are essential for positive outcomes.

Ethical Considerations

Compliance with ethical guidelines

There were no ethical considerations to be considered in this research.

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Conflict of interest

The authors declared no conflict of interest.



Figure 3. Fiberoptic bronchoscopy demonstrated complete tracheal separation

References

- [1] Dertsiz L, Arici G, Arslan G, Demircan A. Acute tracheobronchial injuries: Early and late term outcomes. *Turkish Journal of Trauma & Emergency Surgery*. 2007; 13(2):128-34. [\[PMID\]](#)

- [2] Hamid UI, Jones JM. Combined tracheoesophageal transection after blunt neck trauma. *Journal of Emergencies, Trauma, and Shock*. 2013; 6(2):117-22. [DOI:10.4103/0974-2700.110774] [PMID] [PMCID]
- [3] Minard G, Kudsk KA, Croce MA, Butts JA, Cicala RS, Fabian TC. Laryngotracheal trauma. *The American Surgeon*. 1992; 58(3):181-7. [PMID]
- [4] Ershadi R, Hajipour A, Vakili M. Complete cricotracheal transection due to blunt neck trauma without significant symptoms. *Journal of Surgical Case Reports*. 2017; 2017(6):rjx111. [DOI:10.1093/jscr/rjx111] [PMID] [PMCID]
- [5] Wong EHN, Knight S. Tracheobronchial injuries from blunt trauma. *ANZ Journal of Surgery*. 2006; 76(5):414-5. [DOI:10.1111/j.1445-2197.2006.03738.x] [PMID]
- [6] Karmy-Jones R, Wood DE. Traumatic injury to the trachea and bronchus. *Thoracic Surgery Clinics*. 2007; 17(1):35-46. [DOI:10.1016/j.thorsurg.2007.03.005] [PMID]
- [7] Le Guen M, Beigelman C, Bouhemad B, Wenjie Y, Marmion F, Rouby JJ. Chest computed tomography with multiplanar reformatted images for diagnosing traumatic bronchial rupture: A case report. *Critical Care*. 2007; 11(5):R94. [DOI:10.1186/cc6109] [PMID] [PMCID]
- [8] Hsiao SH, Chen BS, Lee TM, Hsu SY, Lai YY. Delayed diagnosis of complete tracheal transection after blunt neck trauma. *Tzu Chi Medical Journal*. 2009; 21(2):77-80. [DOI:10.1016/S1016-3190(09)60013-6]
- [9] Veit JA, Metternich F. [Management of traumatic tracheal injuries: Presentation of a rare case and review of the literature (German)]. *Laryngorhinootologie*. 2008; 87(4):270-3. [DOI:10.1055/s-2007-995403] [PMID]
- [10] Baumgartner FJ, Ayres B, Theuer C. Danger of false intubation after traumatic tracheal transection. *The Annals of Thoracic Surgery*. 1997; 63(1):227-8 [DOI:10.1016/S0003-4975(96)00691-1]
- [11] Hara KS, Prakash UB. Fiberoptic bronchoscopy in the evaluation of acute chest and upper airway trauma. *Chest*. 1989; 96(3):627-30. [DOI:10.1378/chest.96.3.627] [PMID]
- [12] Roxburgh JC. Rupture of the tracheobronchial tree. *Thorax*. 1987; 42(9):681-8. [DOI:10.1136/thx.42.9.681] [PMID] [PMCID]