



Case Report
**Larynx and thyroid cartilage fracture after
work accident and forensic medical evaluation**

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Abstract

Laryngeal injuries are rare but can be fatal. Depending on the type and severity of the trauma, thyroid and laryngeal cartilage fractures, full-thickness mucosal tears, tracheolaryngeal separation, and injuries leading to pneumomediastinum may be observed. Laryngeal traumas can occur either bluntly or penetratingly. Blunt traumas typically result from traffic accidents, falls, and sports injuries, while penetrating injuries are often caused by gunshot wounds or sharp objects. In this particular case study, the case was a 24-year-old male who was brought to the emergency room after being struck by a forklift at In his physical examination, a 10x1 cm wound was observed on his right scapula, along with subcutaneous emphysema in the subclavicular region. As a result of the examinations, the patient was found to have fractures of the larynx, thyroid cartilage, 8th rib and pneumomediastinum. In this study, it was thought that the thyroid and larynx cartilage fractures occurred as a result of hyperflexion/hyperextension of the neck without a direct blow to the neck region. This case is being presented because it is a rare occurrence in the literature, primarily due to its unique mechanism of injury.

Keywords: Occupational accident, tracheolaryngeal injury, forensic medicine

INTRODUCTION

Laryngeal injuries are rare but can be fatal. It can be seen as a result of blunt trauma, but also as a result of sharp-penetrating tool and firearm injuries. It can also occur as a result of relatively minor damage to the anterior neck that causes posterior compression of the larynx against the spine [1-3].

Mortality rates due to larynx fractures have been reported to be up to 80% in non-hospitalized cases, while it has been reported to be 17.9% in hospitalized cases [4,5]. When a safe airway is provided and laryngeal injury is diagnosed correctly, the mortality

rate drops below 5% [6]. Early diagnosis and treatment have also been associated with improved voice, airway and swallowing outcomes [5-8].

As a result of blunt traumas, they can cause fractures, dislocations and thyroid cartilage and cricoid fractures in the laryngotracheal skeletal system with direct effect. In addition, they can cause such effects with their indirect effects in movements such as hyperflexion/hyperextension of the neck that will occur during trauma [1,2,8]. In this study, a case of tracheolaryngeal injury as a result of hyperflexion/hyperextension with the rare indirect effect of blunt trauma is presented.

CITATION

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CASE

Our case was a 24-year-old male. While working at work, he was brought to the emergency room after a forklift hit his back. In the first examination, it was seen that the patient was conscious, oriented and cooperative, blood pressure was 100/60 mm Hg, and pulse was 90/min. Physical examination revealed 10x1 cm ecchymosis and abrasion on the right scapula, and subcutaneous emphysema in the subclavicular region. There was no direct external examination characteristic for trauma in the neck region. In his systemic examinations, it was found that he had difficulty in breathing and hoarseness. Oxygen saturation level was determined as 98% with 10 L/min oxygenation. In his computed tomography, larynx and thyroid cartilage (figure 1 and figure 2) fractures were found together with pneumomediastinum (figure 1).

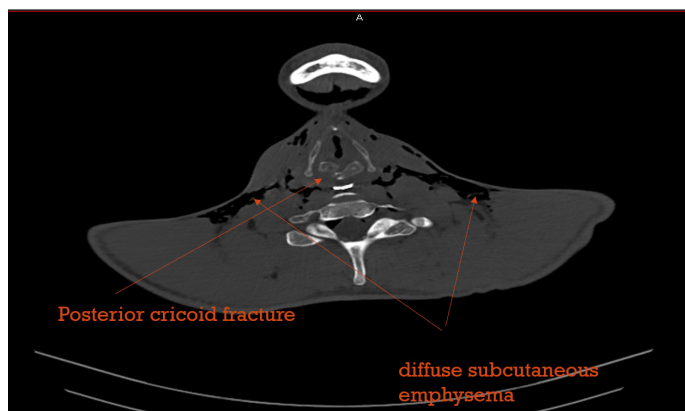


Figure 1. Posterior cricoid fracture and diffuse subcutaneous emphysema

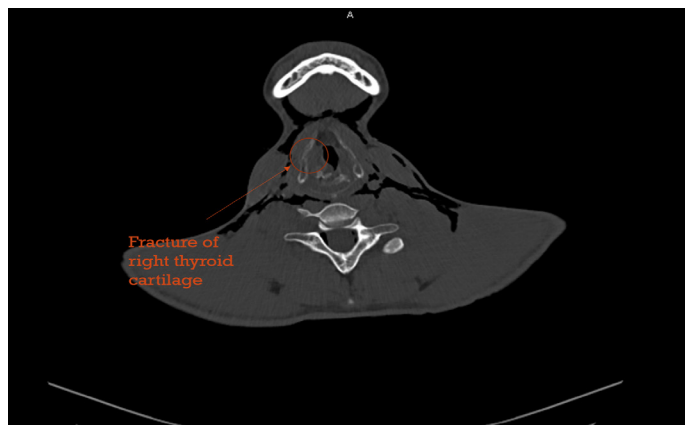


Figure 2. Fracture of right thyroid cartilage

According to the results of the radiographs evaluated as a result of the Thoracic and Cardiovascular Surgery consultation requested due to difficulty in breathing, a fracture was detected in the right 8th rib. And no hemothorax or pneumothorax was detected in the lungs. Fiberoptic laryngoscopy revealed a fracture of the right posterior cricoid cartilage, swelling in the vocal cords and mild bleeding. In the follow-up examination, it was observed that the swelling and bleeding in the vocal cords regressed. Therefore, tracheostomy was not opened. The patient, whose hoarseness

and dyspnea regressed on the 8th day of his treatment, was discharged at the end of the 10th day. In the follow-ups in the otolaryngology outpatient clinic, it was determined that the vocal cords and hoarseness were completely healed after 8 weeks.

DISCUSSION

The protection provided by the bone structures of the sternum, mandible and cervical spine to the larynx skeleton and their own mobility cause laryngeal fractures to be seen rarely [9,10]. The most common causes of laryngeal fractures are motor vehicle accidents, sports-related trauma, assault and drowning [9,11]. In cases where there is a high velocity effect directly on the larynx, laryngeal fracture may occur due to the pressure of the larynx on the spine [12]. In addition, although it is rare, fractures can also be seen due to hyperflexion/hyperextension movements of the neck, apart from the direct effect of trauma [1].

Hoarseness is one of the most important symptoms in thyroid cartilage fractures, conservative treatment is preferred if there is no large hematoma around the fracture, and tracheostomy is applied in cases where there is a large hematoma that causes compression in the airways and extensive damage to the vocal cords [1,12]. In the present case, there was mild swelling and bleeding focus in the vocal cords. Tracheostomy was not performed because the lesions regressed in the follow-ups, conservative treatment was applied.

In forensic medicine practices, the mechanism of injury is important for elucidating the event [2]. In this case, injury occurred as an indirect effect of trauma to the neck region and it was determined that it was life-threatening due to the damage. The case we presented is compatible with the literature findings in terms of symptoms, diagnosis and treatment. It is presented because it is a rare case in forensic medicine practices in our country due to the mechanism of case formation and the type of injury.

Conflict of interests

The authors declare that there is no conflict of interest in the study.

Financial Disclosure

The authors declare that they have received no financial support for the study.

Ethical approval

Ethics committee approval is not required.

Acknowledgment

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