



Cricoid fracture and paralaryngeal space hematoma due to blunt trauma to the neck

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ABSTRACT

Blunt and penetrating trauma to the neck can cause life-threatening injuries that require immediate attention of the physicians. Many important structures such as spinal cord, esophagus, larynx, trachea, jugular veins, cranial nerves and carotid arteries can be injured by trauma to this region. Injuries of these structures might cause different symptoms and the physician should be alert for patient's complaints. We present a case of cricoid cartilage fracture and paralaryngeal space hematoma and evaluate the effect of late admission on management of severe blunt trauma to neck.

KEY WORDS: Cricoid; Neck; Trauma; Airway

INTRODUCTION

The blunt traumas to the neck are very common injuries, usually causing minor bruising, or soft tissue damage. The position of the mandible and its central location in the neck usually protects the larynx from direct traumas. It can be subject to direct traumas during sports, traffic accidents and interpersonal violence. We present a case of trauma to the neck with cricoid cartilage fracture and a severe hematoma obstructing the airway. We discuss the management strategy on a case that didn't refer to a hospital immediately after the event, but referred 12 hours later.

CASE REPORT

A 44 year old male patient referred to our emergency department (ED) with neck pain and hoarseness twelve hours after a street fight. He was struck with a metal rod on the right side of his neck and had a 4 cm long and 1 cm wide echimosis on the area of impact. He had previously referred to another ED immediately after the event. He was discharged after evaluation of cervical X-rays. Patient was stable at the time of referral. He started to feel difficulty in breathing and decided that he should visit the hospital again. His vital signs, initial neurological examination, chest

and neck X-rays were normal. His blood counts were normal. His neck was stabilized and the patient was admitted to observation room after his initial work up.

Patient was consulted with a neurosurgeon and an otolaryngologist. Indirect laryngoscopy of the patient at the emergency department with a 4 mm flexible nasopharyngoscope revealed medialization of the right vocal cord with no arytenoid movement and swelling of the piriform sinus. A purple color change, which raised the suspicion of a hematoma, was observed. A contrasted computerized tomography (CT) scan was performed in order to see whether there was a vascular injury or not and the evaluation of bony and cartilaginous structures of the neck. Although magnetic resonance imaging is superior to CT in soft tissue evaluation, CT is a faster method that also cricoid cartilage was fractured and cricoarytenoid dislocation was noted (Figure 1-2). In patient's neck computerized tomography, a swelling in the paralaryngeal space, which obstructed more than half of the laryngeal air column was seen, (Figure 2). The patient's blood gas analysis and O₂ Hb saturation monitoring were in normal ranges, so tracheal intubation was postponed. The patient was admitted to otolaryngology clinic for close follow-up. Intravenous steroid treatment and antibiotics were administered. The

patient underwent direct laryngoscopy the day after he was admitted to the hospital. Deep tracheal intubation with the help of a fiber optic flexible bronchoscope was performed. After the insertion of laryngoscope the laryngeal structures were thoroughly evaluated by microscope and the subglottic region was examined with a 4mm rigid 70 degrees angled endoscope. No cartilage exposure was seen and the otolaryngologists decided on conservative treatment. No surgical correction was performed. The patient's symptoms improved in a week and he was discharged from the hospital without any surgical intervention.



Figure 1. Cricoid fracture

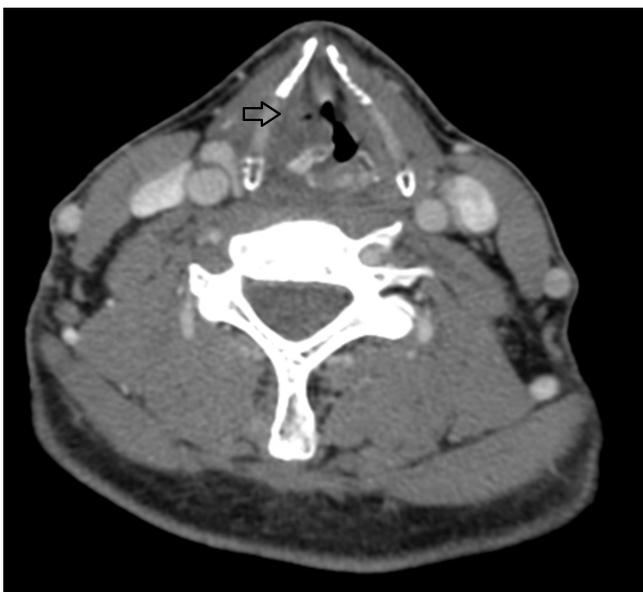


Figure 2. Arethyroid dislocation and paralaryngeal space haematoma

DISCUSSION

In a recent study on interpersonal violence head, neck and face region is reported as most commonly injured site in both males (37%) and females (55.4%). Hard and blunt weapons were used more commonly against females (76.6%) than males (53%) and were more commonly used in domestic violence [1]. In the presented case the patient was male, attacked with a blunt weapon in the street and was struck in the neck.

Blunt trauma composes 5% of all neck trauma. Aerodigestive injuries are rare but potentially life-threatening injuries. In a level I trauma center, over 8 years, only 0.13% (16/12789) of the trauma cases had tracheobronchial injuries [2]. Airway obstruction is probably the most rapid fatal outcome of a blunt neck trauma. In our case, the patient had hoarseness and dyspnea due to airway compromise. There might have been need for tracheal intubation if the clinical signs worsened but the patient stabilized.

Most common reason of blunt neck trauma is motor vehicle accidents [3]. Strangulation, choke holds, clothesline injuries in sports and vehicles are other common reasons of blunt trauma to the neck. The remaining reasons are direct blows by fists, feet and other blunt weapons and excessive cervical manipulation [4-5]. In this case, the trauma was from direct impact by a metal rod.

The diagnostic evaluation of a blunt neck injury should be done very carefully. Rathlev et al proposed an algorithm for the management of blunt neck traumas [6]. The first assessment of a patient with a blunt neck trauma should be done according to his hemodynamic stability. Stable or unstable, the cervical spine should be immobilized first. If the patient is unstable, physician should secure airway, blood products should be prepared in case of a hemorrhagic shock, and signs of vascular and cerebral injury must be searched. If the patient is stable, the evaluation continues with a careful physical examination, chest X-ray and neck X-rays. The normal findings in the first assessment lead us to end the observation. If the patient is suspected to have vascular injury, second diagnostic step is multidetector CT angiography (MDCTA) of the neck and brain. If the findings are abnormal, management of injured vasculature has priority. If the findings are normal but there is a high suspicion of aerodigestive injury, cerebral angiography, esophagoscopy and endoscopy can be considered. In our case the patient's vital signs were stable. The airway compromise didn't lead to any blood gas disturbances or O₂ Hb saturation decrease. Due to late admission and hemodynamic stability, no further work-up was carried out after CT. Patient was internalized by otolaryngology for close follow up.

Securing the airway is probably the most important step in management of a patient with laryngotracheal injury. In a recent study, 65% of these patients need emergency airway intervention [7]. Emergency surgical airway management

was needed in 13.5% of patients. 52% of the patients required diagnostic or interventional airway surgery. In this case, there was no indication for tracheal intubation due to stable course of patient's symptoms.

MDCTA is a rapid and accurate diagnostic modality in evaluation of neck injuries [8]. The images, which give important information about the vital structures of the neck, can be obtained in about a minute and doesn't have logistical constraints. A review on management of laryngeal traumas revealed that CT may assist the decision of observation or surgical exploration [9]. Additionally, choice of intubation or tracheostomy should be individualized. We performed a MDCTA, which revealed no major injury to vascular structures of the neck. Although the CT revealed an airway compromise, the patient was stable for 12 hours before his admission to our ED. Late admission in our hemodynamically stable patient encouraged conservative approach with close follow up.

Flexible nasopharyngoscopy is a useful diagnostic tool in evaluation of the patient for the vocal cord function [6]. In our case right vocal cord was medialized and had no movement in the initial examination. No cartilage exposure was noted in the airway due to fracture of cricoid cartilage.

Late admission in hemodynamically stable patient may encourage conservative approach in severe blunt neck trauma. The physicians have to make individualized decisions in late admissions. Flexible laryngoscopy and MDCTA may be useful tools in decision of conservative management.

CONFLICT OF INTERESTS

The authors declare that there are no conflicts of interest regarding the publication of this paper.

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