Chapter 81

Laryngeal trauma: a case with blunt thyroid cartilage fracture

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ABSTRACT
Introduction: Laryngotracheal trauma is a rare condition to be found in hospital care and has high morbidity and mortality. Methodology: This study reports the case of a 48-year-old man, victim of a car-by-car accident, who was admitted to the emergency room hemodynamically stable, on spontaneous ventilation, with progressive dysphonia and no laryngeal stridor. Through computed tomography, a fracture of the thyroid cartilage's notch with lateral dislocation was identified. Due to this condition's benign evolution, a conservative approach was the chosen line of care. Results and discussions: At present, there is no universal algorithm for approaching laryngeal trauma, however, all cervical traumas require high suspicion of laryngeal fracture in order for early treatment to take place, improving prognosis and reducing the risk of severe complications. Conclusion: Thus, this report highlights the importance of proper management of this condition, in addition to the implementation of a multidisciplinary approach in diminishing future damage and endowing conservative treatment to laryngotracheal injuries.

Keywords: Emergencies, Laryngotracheal injuries, Airway management.

1 INTRODUCTION

Laryngotraca traumas are rare in hospital care, with a frequency of 1 per 14,000 to 40,000 cases in emergency services.[1] This type of injury should be suspected and investigated in patients with cervical trauma and symptoms ranging from dysphonia, anterior cervical pain, dyspnea and even severe respiratory involvement due to airway obstruction[2]. There is still no universal algorithm for addressing laryngeal trauma, however, directed physical examination combined with flexible laryngoscopy and computed tomography are key elements for the diagnosis and screening of these patients. This report presents the case of a patient who was victims of laryngotracheal trauma who underwent conservative treatment.

2 METHODOLOGY

Man, 48 years old, admitted to the emergency room of the Samuel Libânio Clinic Hospital, Pouso Alegre (MG), after a car x car collision on an expressway, with two deaths at the scene, with the patient being the only survivor. Admitted hemodynamically stable, with BP of 136/84mmHg, heart rate of 109bpm, respiratory rate of 20 irpm, SaO2 of 99% and 14 points on the Glasgow Coma Scale, loss of one point attributed to confusion. On examination, he was on spontaneous ventilation without laryngeal stridor, with deformity in the lower limbs bilaterally and, significant and progressive dysphonia. Trauma, *Injury Severity Score* (ISS) and *Revised Trauma Score* (RTS) scores were applied, which resulted in the following survival predictions of 22% and 98.8%, respectively. Due to the high intensity of trauma and according to the ATLS 10 protocol, he was chosen to perform computed tomography of the skull, cervical spine and neck, chest and abdomen, in addition to radiography of the limbs. In addition to the bilateral fracture of the femur and transverse fracture of L1 and L2, a fracture of thyroid cartilage was evidenced in its notset, with lateral dislocation to the right of the same, which caused moderate anatomical alteration. The patient was kept under observation in the emergency room and reevaluated periodically. As there was no worsening or appearance of any alarm signal (airway obstruction, stridor or severe respiratory distress) conservative conduct was chosen. The patient evolved without complications and with progressive improvement of dysphonia, without the need for intervention, being approached only by orthopedics for correction of femoral fractures. At no time did he find difficulty swallowing. He is currently under outpatient follow-up.

3 RESULTS AND DISCUSSIONS

Severe laryngotracheal trauma corresponds to a lesion of high mortality at the scene or during pre-hospital care[5] and, for this reason, has a low incidence in the hospital environment. The absence of evident signs of laryngeal injury makes it essential to perform an organized multidisciplinary care to avoid inadequate management and diagnosis, since early treatment of lesions improves prognosis and reduces the risk of serious complications to trauma victims[2,7,8]. Therefore, all cervical traumas require a high level of suspected laryngeal fracture due to asymptomatic cases[3,4]. As for the mechanism of trauma, this can be blunt or penetrating, being the most common cause of auto collision, with neck extension resulting in thyroid cartilage fracture, mucosal rupture, edema and arytenoid cartilage detachment[1,3]. It is essential to understand the kinematics of the injury when the trauma is of the penetrating type, in order to estimate affected structures. The most common symptoms of laryngotracheal traumas include dyspnea, dysphonia, hoarseness, stridor, cervical pain, dysphagia, and hemoptysis, and the gold standard diagnosis is made by computed tomography of the neck. Physical examination may include findings such as laryngeal tenderness, cyanosis, subcutaneous emphysema, and air escape from a cervical injury (traumatopnea). However, the exuberance of the findings may not correspond to the extent of the lesion[8]. Individualized management and treatment should be performed from the categorization of these injuries into five groups (mild, moderate, severe, very severe and critical, respectively), and the patient in this case is classified as

type 2 - moderate, with a fracture without significant displacement. The main objective of the conduct in the face of laryngeal trauma is to maintain airway clearance, it is necessary to ensure airway pathway pathening through possible effective procedures at the time and place of trauma [2,9]. There is divergence in the literature regarding the most appropriate method for obtaining airway patency[1-5] and how laryngeal trauma causes difficulties in performing intubation through distorted anatomy, poor visualization and suboptimal conditions 2-4 there is a risk of increasing new lesions and worsening of existing ones. Thus, tracheostomy should preferably be preferred with local anesthesia,[3] which can be performed through the existing cervical wound itself, in the presence of anterior laceration of the neck[3,10]. In addition, the cervical spine should be safely immobilized to avoid additional neurological damage and exclude cervical lesions in all patients with type 2, 3, 4 or 5 damage, which in this case was performed by computed tomography. The management in laryngotracheal trauma should be conservative and postponed, except in the presence of an injury in which a primary repair needs to be performed. In relation to definitive management, it is recommended that it be done in the first 24 hours by a multidisciplinary team of trauma services, emergency surgery, head and neck surgery, otorhinolaryngology and thoracic surgery. [4] Conservative treatment of laryngeal lesion can be instituted in patients with no respiratory difficulty, minimal mucosal laceration without cartilage exposure, small edema with or without hematoma, isolated fracture of thyroid cartilage without displacement of fragments, vocal folds with preserved movements and without involvement of arytenoid cartilages. [11,12] After the treatment and treatment, the repair of phonation and other functions of the laryngeal parade should be sought. [8.10.13]

4 CONCLUSION

Acute laryngeal trauma should be readily recognized due to high mortality in cases of greater severity and the subtlety of symptoms in mild and moderate cases, which may go unnoticed. This report highlights the importance of adequate management and the implementation of the multidisciplinary approach in damage control and conservative treatment of laryngotracheal injury. Outpatient follow-up is relevant since late complications may occur due to infections and altered anatomy and may occur even with correct management[13].

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