

# THYROID CARTILAGE FRACTURE IN A BLUNT CERVICAL TRAUMA: A CASE REPORT

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**Abstract: Introduction:** Laryngotracheal trauma is rare in hospital care and has high morbidity and mortality. **Methodology:** A 48-year-old man, victim of a car-by-car accident, was admitted to the emergency room, hemodynamically stable, on spontaneous ventilation, with progressive dysphonia and no laryngeal stridor. Through computed tomography, fracture of the thyroid cartilage in its notch with lateral dislocation was identified. Due to the benign evolution of the condition, a conservative approach was chosen. **Results and discussions:** There is still no universal algorithm for approaching laryngeal trauma, however all the cervical traumas require a high level of suspicion of laryngeal fracture so that early treatment occurs in order to improve the prognosis and reduce the risk of serious complications for the trauma victim. **Conclusion:** This report highlights the importance of adequate management and the implementation of a multidisciplinary approach in damage control and conservative treatment of laryngotracheal injury. **Keywords:** Emergencies. Laryngotracheal injuries. Airway management.

## INTRODUCTION

Laryngotracheal trauma is rare in hospital care, with a frequency of 1 per 14,000 to 40,000 cases in emergency services.<sup>1</sup> This type of injury must be suspected and investigated in patients who have cervical trauma and symptoms ranging from dysphonia, anterior neck pain, dyspnea and even severe respiratory impairment due to airway obstruction<sup>2</sup>. There is still no universal algorithm for approaching laryngeal trauma, however, targeted 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

victim of laryngotracheal trauma who underwent conservative treatment.

## METHODOLOGY

Male, 48 years old, admitted to the emergency room of Hospital das Clínicas Samuel Libânio, Pouso Alegre (MG), after a head-on collision between car and car on an expressway, with two deaths at the scene, the patient being the only survivor. Admitted hemodynamically stable, with BP of 136/84mmHg, heart rate of 109bpm, respiratory rate of 20 bpm, SaO<sub>2</sub> 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. The trauma scores, Injury Severity Score (ISS) and Revised Trauma Score (RTS) were applied, which resulted in the following survival predictions of 22% and 98.8%, respectively. Due to the great intensity of the trauma and according to the ATLS 10 protocol, it was decided to perform computed tomography of the skull, cervical spine and neck, thorax and abdomen, in addition to radiography of the limbs. In addition to the bilateral fracture of the femur and fracture of the L1 and L2 transversus, a fracture of the thyroid cartilage in its notch was observed, 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 periodically reassessed. As there was no worsening or appearance of any alarm signs (airway obstruction, stridor or severe respiratory distress), a conservative approach 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 femur

fractures. He did not present, at any moment, difficulty in swallowing. He is currently under outpatient follow-up.

## RESULTS AND DISCUSSIONS

Severe laryngotracheal trauma corresponds to a high mortality injury in the scene or during pre-hospital care<sup>5</sup> and, for this reason, it has a low incidence in the hospital environment. The absence of obvious signs of laryngeal injury makes it essential to carry out an organized multidisciplinary care to avoid inadequate management and diagnosis, since early treatment of injuries improves the prognosis and reduces the risk of serious complications for the trauma victim<sup>2,7,8</sup>. Therefore, all the cervical traumas require a high level of suspicion of laryngeal fracture due to asymptomatic cases<sup>3,4</sup>. As for the trauma mechanism, it can be blunt or penetrating, the most common cause being a car collision, with extension of the neck resulting in fracture of the thyroid cartilage, rupture of the mucosa, edema and detachment of the arytenoid cartilage<sup>1,3</sup>. It is fundamental to understand the kinematics of the wound when the trauma is of the penetrating type, in order to be able to estimate affected structures. The most common symptoms of laryngotracheal trauma include dyspnea, dysphonia, hoarseness, stridor, neck pain, dysphagia and hemoptysis and the gold standard diagnosis is made by computed tomography of the neck. On physical examination, findings such as tenderness along the larynx, cyanosis, subcutaneous emphysema, and air leakage from a cervical wound (traumatopnea) may be included. However, the exuberance of the findings may not correspond to the extent of the lesion<sup>8</sup>. Individualized management and treatment must be carried out based on the categorization of these injuries into five groups (mild, moderate, severe, very severe

and critical, respectively), with the patient in this case classified as type 2 - moderate, with a fracture without significant displacement. The main objective of dealing with laryngeal trauma is to maintain airway clearance, it is necessary to ensure airway patency through effective procedures possible at the time and place of the trauma<sup>2,9</sup>. There is divergence in the literature regarding the most appropriate method for obtaining airway patency<sup>1-5</sup> and how laryngeal trauma causes difficulties in performing intubation due to distorted anatomy, poor visualization and suboptimal conditions<sup>2-4</sup> there is a risk of increasing new lesions and worsening existing ones. Thus, a tracheostomy with local anesthesia must be preferred,<sup>3</sup> which can be performed through the existing cervical wound itself, in the presence of anterior neck laceration<sup>3,10</sup>. In addition, the cervical spine must be securely immobilized to avoid further neurological damage and to exclude cervical injuries in all patients with type 2, 3, 4 or 5 damage, which in this case was performed using computed tomography. The conduct of laryngotracheal trauma must be conservative and postponed, except in the presence of an injury in which a primary repair needs to be performed. Regarding the definitive management, it is recommended that it be carried out in the first 24 hours by a multidisciplinary team from trauma services, emergency surgery, head and neck surgery, otorhinolaryngology and thoracic surgery.<sup>4</sup> Conservative treatment of laryngeal lesions can be instituted in patients with no respiratory difficulty, minimal mucosal laceration without cartilage exposure, small edema with or without hematoma, isolated fracture of the thyroid cartilage without displacement of the fragments, vocal folds with preserved movements and without involvement of the arytenoid cartilages.<sup>11,12</sup> Once the care and treatment has been carried out, repair

of phonation and other functions of the laryngeal apparatus must be sought.<sup>8,10,13</sup>

## CONCLUSION

Acute laryngeal trauma must be promptly recognized due to the high mortality in more severe cases 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 a multidisciplinary approach in damage control and conservative treatment of laryngotracheal injury. Outpatient follow-up is relevant since late complications can occur due to infections and changes in the anatomy and can occur even with correct conduct<sup>13</sup>.

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