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Blunt Neck Trauma with Isolated Thyroid Cartilage Fracture after a Road Traffic Accident: A Rare Case and Review of Diagnostic Challenges

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Abstract: ***Blunt neck trauma is an infrequent but potentially serious clinical presentation in the emergency department. Among laryngeal injuries, thyroid cartilage fractures are particularly rare and can be easily overlooked, especially in patients who are hemodynamically stable and lack dramatic external signs. These injuries, if missed, can lead to significant morbidity including airway obstruction, dysphonia, and long - term voice impairment. Prompt recognition and imaging are crucial in ensuring optimal outcomes.***

Keywords: Thyroid cartilage fracture, blunt neck trauma, laryngeal injury

1. Introduction

Blunt laryngeal injuries are rare and often underdiagnosed in the emergency setting. Among these, thyroid cartilage fractures account for a minority but carry significant risk due to their proximity to critical airway structures. Missed injuries can lead to airway obstruction, voice loss, or long - term morbidity. Early diagnosis and appropriate management are crucial. We present a case of isolated thyroid cartilage fracture following a road traffic accident, highlighting the diagnostic challenges and management approach in the emergency department

2. Case Report

A 61 - year - old male was brought to the ED after a motorbike collision with a autorickshaw. He was wearing a helmet but reported that the helmet strap had tightly compressed his neck during impact. On arrival, he was hemodynamically stable and alert with a Glasgow Coma Scale of 15.

Patient had only complaints of hoarseness of voice. Due to persistent hoarseness and localized pain, a contrast - enhanced CT neck was done, which revealed a mildly displaced fracture of the right thyroid lamina along its posterior aspect and an undisplaced fracture of the left thyroid lamina along its anterior aspect with minimal effacement of bilateral Para laryngeal spaces noted without airway compromise or hematoma. (Figure 1 and 2). No other facial, cervical spine, or thoracic injuries were found.

The patient was admitted under ENT observation and managed conservatively with voice rest, analgesics, and head - end elevation. No surgical intervention was required. His hoarseness improved over the next 5 days, and he was discharged with outpatient follow - up. At 2 weeks, his voice had returned to baseline.

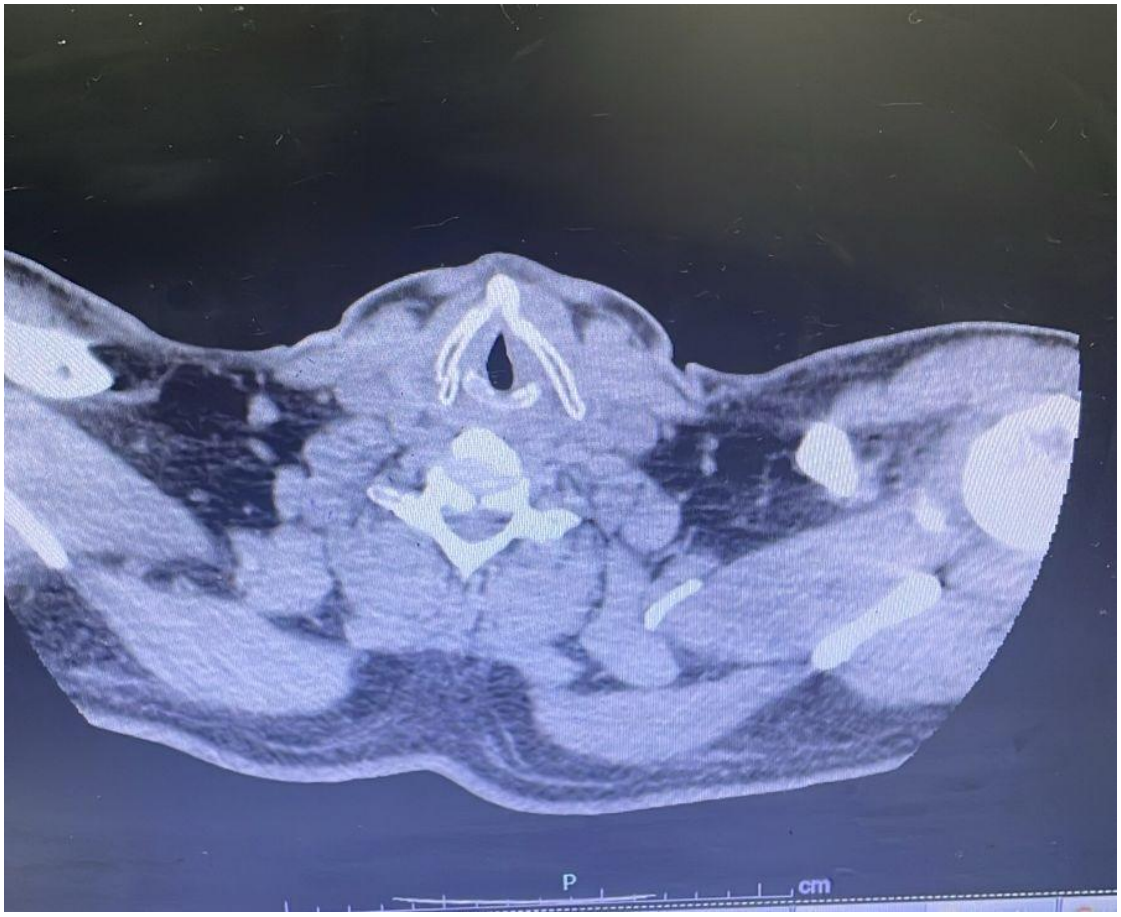

Figure 1: (Contrast enhanced CT of the neck at the level of thyroid cartilage demonstrating mildly displaced fracture of the right thyroid lamina along its posterior aspect)

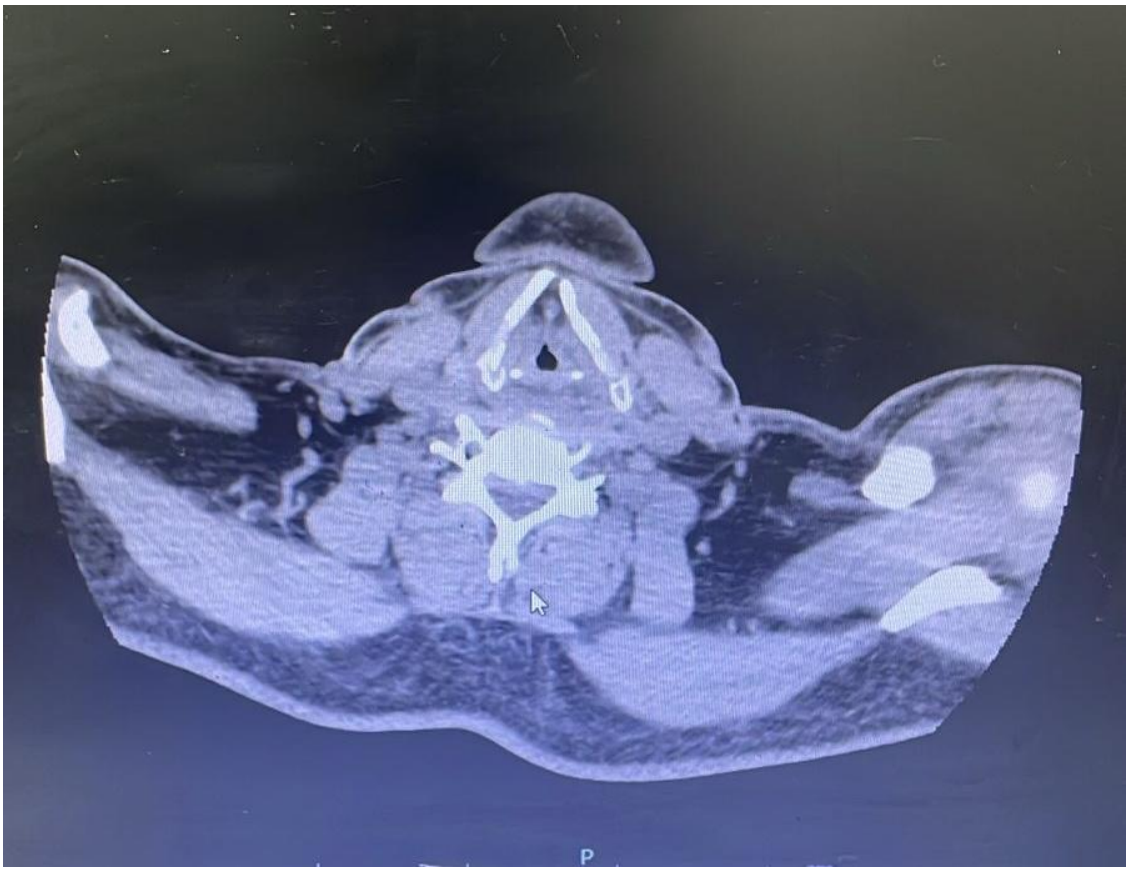

Figure 2: (Contrast enhanced CT of the neck at the level of thyroid cartilage demonstrates an undisplaced fracture of the left thyroid lamina along its anterior aspect with minimal effacement of bilateral Para laryngeal spaces noted without airway compromise or hematoma)

3. Discussion

Laryngeal trauma is a rare but potentially life - threatening injury, accounting for less than 1% of all blunt trauma presentations.1 The protection afforded to the laryngeal skeleton by the bony structures of the sternum, mandible and cervical spine and its own mobility provides an explanation to the infrequent occurrence of laryngeal fractures.2 Within this spectrum, thyroid cartilage fractures are particularly uncommon, yet they carry significant morbidity due to their association with airway compromise and long - term voice disturbances.3 The rarity of such cases, coupled with often subtle clinical findings, makes them a diagnostic challenge in the emergency department.

Blunt neck trauma typically results from mechanisms such as motor vehicle collisions, direct blows to the neck, falls, or strangulation. In this case, compression from a helmet strap during a road traffic accident represents an atypical but recognized cause of laryngeal injury.4 While severe trauma may manifest with obvious signs such as stridor or respiratory distress, many patients present with non - specific symptoms like hoarseness, anterior neck tenderness, or voice changes, as seen in our patient.

Hoarseness has been consistently reported as the most sensitive clinical indicator of laryngeal injury and should always prompt further evaluation.5 Additional signs include pain on swallowing, dyspnea, subcutaneous emphysema, and hemoptysis, though their absence does not rule out serious injury.2 Importantly, even in the absence of overt airway compromise, persistent voice changes or focal tenderness should raise suspicion for internal structural damage.

The imaging modality of choice is contrast - enhanced computed tomography (CT), which provides detailed visualization of laryngeal cartilages and surrounding soft tissues and is significantly more sensitive than plain radiography.6 In cases with suspected mucosal or vocal cord involvement, flexible fiberoptic laryngoscopy may be indicated to assess internal airway structures.3

Schaefer - Fuhrman classification, a commonly used system, stratifies laryngeal injuries into five groups based on severity, guiding management from conservative observation to surgical intervention.7 Displaced and Non displaced fractures with intact mucosa and no airway compromise, like in this case, are generally managed conservatively with voice rest, analgesics, head elevation, and close ENT observation.8 Surgical repair, including open reduction and internal fixation (ORIF), is reserved for displaced fractures, mucosal lacerations, or airway obstruction.

This case illustrates the critical role of the emergency physician in early recognition and appropriate triage of such injuries. Emergency clinicians should maintain a high index of suspicion, especially when patients report hoarseness or neck tenderness following any significant blunt trauma to the neck.

4. Learning Points

Delayed or missed diagnosis of thyroid cartilage fractures can lead to complications such as airway obstruction, vocal cord paralysis, or permanent dysphonia.9 Early CT imaging and ENT consultation are essential in reducing these risks. Moreover, in resource - limited or rural

EDs, where immediate ENT input may not be available, recognition of clinical red flags and prompt decision - making regarding transfer or airway protection becomes even more crucial.

Each reported case of isolated thyroid cartilage fracture adds to the sparse literature, emphasizing the diversity of mechanisms and the need for vigilance, even when clinical signs are minimal. Our case reinforces the principle that absence of severe external trauma does not preclude serious internal injury, especially in anatomically vulnerable areas like the neck.

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