

# Early Recognition and Management of Laryngeal Fracture: A Case Report

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## ABSTRACT

**Background:** Laryngeal fracture is a rare condition that can lead to significant problems with airway patency, voice production, and swallowing. Conflict in the literature exists regarding the most suitable way to manage this injury.

**Case Report:** We present the case of a 29-year-old Caucasian man who sustained a displaced fracture of the thyroid cartilage due to blunt trauma. He reported no swallowing, breathing, or voice problems after 1 year, and his recovery can be attributed to the early recognition and proper management of his condition.

**Conclusion:** This case illustrates the importance of ensuring a high level of suspicion for laryngeal fracture in the acute trauma patient. Early identification of this injury allows early intervention that not only protects the airway but also improves long-term voice and airway outcomes.

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## INTRODUCTION

Laryngeal fracture is a rare and potentially life-threatening traumatic injury with a reported incidence of 1 in 30,000 patients who present to the emergency department.<sup>1-3</sup> Because of the uncommon nature of

this injury and low physician awareness, many laryngeal fractures go undiagnosed.<sup>2,4</sup> Even when laryngeal fractures are diagnosed, they are often managed poorly, leading to significant problems with airway patency, voice production, and swallowing. Laryngeal trauma has an overall mortality rate of 17.9%; early diagnosis and management are essential to avoid negative implications associated with this rare injury.<sup>5</sup>

## CASE REPORT

A 29-year-old Caucasian man was competing in a triathlon when he fell off his bike and struck his chest and anterior aspect of his neck on a metal pole. He was taken to the nearest emergency department and was noted to have multiple abrasions and some hoarseness of his voice. A laryngeal injury was suspected, so a computed tomography (CT) scan was obtained that revealed a fracture of the left lamina of the thyroid cartilage (Figure). He was taken to the operating room and underwent an open reduction and internal fixation (ORIF) of the thyroid cartilage with miniplates. He was admitted to the intensive care unit (ICU) and extubated on postoperative day 2 without the need for tracheostomy. Video stroboscopy performed 2 weeks after the event was unremarkable, and he reported no swallowing, breathing, or voice problems after 1 year.

## DISCUSSION

Laryngeal fracture is an infrequent injury due to the high mobility of the larynx and the protection it receives from the surrounding bony structures of the sternum, mandible, and cervical spine.<sup>2,4</sup> Blunt external trauma to the neck from motor vehicle accidents, sports-related trauma, assault, and strangulation is the most common cause of laryngeal fracture.<sup>3,4</sup> Penetrating trauma is the second leading cause, often due to gunshot or stab wounds to the neck.

Common clinical features of laryngeal fracture include hoarseness, dysphagia, odynophagia, anteri-

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**Figure.** Displaced fracture of the left lamina of the thyroid cartilage shown on a computed tomography scan. The left lamina is displaced anteriorly 0.7 cm (upper arrow) with airway narrowing caused by fullness of the vocalis muscle secondary to decreased length from the anterior commissure of the larynx and arytenoid (lower arrow).

or neck pain, dyspnea, and hemoptysis.<sup>1-4,6</sup> Some patients with a laryngeal fracture may exhibit no symptoms, so a high level of suspicion is required of all anterior neck trauma.<sup>3,4</sup> A CT scan of the neck is considered to be the gold standard for diagnosing this type of injury.<sup>2-4,7</sup>

Maintaining airway patency is the primary objective when treating laryngeal trauma. However, conflict in the literature exists regarding the most suitable method to achieve airway patency; both endotracheal intubation and tracheostomy have been recommended.<sup>1-5</sup> Intubating a patient who has sustained laryngeal trauma can be extremely difficult because of distorted anatomy, poor visualization, and suboptimal conditions and is best performed in the operating room, as demonstrated in the current case.<sup>2-4</sup>

In a recent study, Mendelsohn et al analyzed 564 cases of laryngeal trauma and recommended tracheostomy within 24 hours to secure the airway because early tracheostomy decreases the length of stay in both the ICU and hospital.<sup>5</sup> In extreme circumstances

in which patients are at an imminent risk of losing their airways, cricothyroidotomy is a reasonable alternative.<sup>2,4</sup> Although endotracheal intubation is not contraindicated, it should be performed with caution and by the most experienced physician available to prevent further laryngeal damage.<sup>3,4</sup>

After the airway has been secured, the anatomy of the larynx must be restored to improve the long-term voice outcomes in these patients.<sup>1,3</sup> Nondisplaced fractures can be managed nonoperatively, but displaced fractures should undergo ORIF as soon as possible.<sup>1-5,8</sup> Butler et al examined 112 cases of laryngeal trauma and found that early treatment within 48 hours resulted in significantly better outcomes for voice and airway function when compared to delayed treatment.<sup>4</sup>

## CONCLUSION

This case illustrates the importance of ensuring a high level of suspicion for laryngeal fracture in the acute trauma patient. Early identification of this injury allows early intervention that not only protects the airway but also improves long-term voice and airway outcomes.

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