

Atraumatic fracture of the larynx due to sneezing.

A case report

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Case Report

Head & Neck Surgery



Background

Atraumatic larynx fracture is a rare pathology, with potentially catastrophic complications. We present a case of a 35-year-old male with an atraumatic larynx fracture following a sneeze episode. Symptoms included odynophagia, dysphagia, and hoarseness, and a physical examination revealed subcutaneous emphysema in the anterior cervical region. A cervical tomography evidenced a right posterolateral larynx fracture. There were no signs of airway obstruction or dyspnea. The patient was admitted for surveillance and treated conservatively with analgesics, antibiotics, and total phonation repose. The patient was discharged 8 hours later due to adequate clinical development, to continue management as out-patient. This case highlights the importance of recognizing the possibility of aerodigestive complications associated with atraumatic larynx fractures. The Schaefer grading system classifies this fracture into five grades and is very helpful in choosing the management. It also demonstrates that conservative treatment is effective in >95% of cases, as surgical intervention is unnecessary in most cases.

Keywords: Atraumatic larynx fracture; case report; sneeze episode; laryngotracheal injury.

The larynx is a narrow region of the respiratory tract that hosts the phonatory system and functions as protection for the airway. Atraumatic fractures of the larynx are rare, with only 17 reported cases reported worldwide. Etiology includes aggressive sneezing and coughing episodes due to the increased intraluminal pressure in the subglottic region, resulting in a rupture in and of itself. The clinical presentation of this pathology is characterized by a triad of dysphagia, odynophagia, and hoarseness, frequently associated with subcutaneous emphysema. Diagnosis is established with computed tomography (CT), although laryngoscopy, nasendoscopy, and bronchoscopy also play an important role in evaluating the severity. It may be accompanied with subglottic edema and hematoma above the vocal cords ipsilateral to the lesion. Treatment of this kind of lesion will depend on the severity. The Schaefer classification system classifies injury into 5 grades: 1) minor hematoma without fracture; 2) edema/hematoma with minor mucosal disruption but no exposed cartilage; 3) massive edema/hematoma with mucosal disruption and exposed cartilage, vocal fold immobility, and displaced fracture; 4) two or more grade 3 injuries; 5) complete laryngotracheal separation. Grades 1 and 2 may be treated conservatively with high success rates. Grades 3 to 5 should be treated surgically (Table 1) Early intervention is vital due to the risk of airway obstruction.

Case report and discussion

We report a case of a 35-year-old man of Mexican origin, without relevant clinical history, except for occasional social consumption of tobacco and alcoholic beverages. He arrives to the emergency department (ED) with the main complaint of moderate soreness in the anterior neck region, dysphonia, odynophagia, dysphagia, and bloody sputum. The patient denies any traumatic event of the neck region but refers symptoms began shortly after sneezing episodes. Upon physical examination, the neck is cylindrical with subcutaneous emphysema in the supra and infra hyoid region, no visible hematoma, lungs clear to auscultation, no use of accessory muscles, no crackles or wheezes. The laboratory studies are within normal ranges. As a direct approach emergency department ordered a CT scan which reported a break in the continuity of the larynx above the vocal cords, without any visible displacement or deviation of adjacent structures; also without the obstruction of the airway, subcutaneous emphysema is demonstrated in the anterior neck region (Figure 1). The patient is admitted to the ED for observation, establishing a conservative approach with analgesia (acetaminophen 500 mg PO q8h), oral steroids (prednisone 5 mg q8h), antibiotics (amoxicillin/Clavulanic acid 500/125 mg q8h), and total vocal rest. After 8 hours of airway surveillance, there was no progression in the severity of symptoms, airway obstruction, or other signs. He

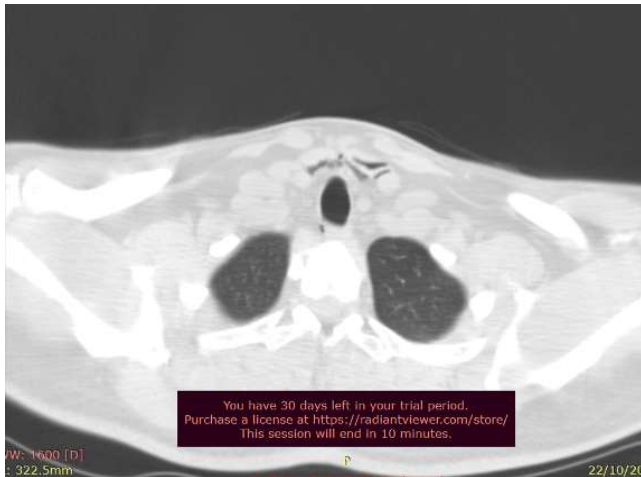


Figure 1: Break in the continuity of the larynx above the vocal cords and subcutaneous emphysema is demonstrated in the anterior neck region.

was discharged to continue surveillance as an outpatient, and medications for one week. Follow-up at 14 days evidenced a full recovery with the absence of symptomatology, and control CT without alterations.

Conclusion

Due to limited literature globally related to this pathology, there are no uniform guidelines. The physical exploration through the triad of dysphagia, odynophagia, hoarseness, and subcutaneous emphysema guides us to make the diagnosis.

Conflicts of interest

The authors declare no conflict of interest.

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Grade	Definition	Management
I	No fractures / minor laceration / minimal edema	Observation Medical supportive care
II	Undisplaced fractures / mucosal disruption without cartilage exposure	Observation Medical supportive care
III	Massive edema / mucosal disruption / exposed cartilage / vocal fold immobility and displaced fracture	Tracheostomy and open laryngeal exploration
IV	Group with disruption of anterior larynx / unstable fractures, two or more fractures lines or massive trauma to laryngeal mucosa	Tracheostomy and open laryngeal exploration
V	Complete laryngotracheal separation	Tracheostomy and open laryngeal exploration

Table 1. Schaffer’s classification for larynx fracture.

Case	Demographic data	Causing event	Treatment	Complications
Quinlan, 1950.	44 male, U.K.	Sneezing	Observation, liquid diet, voice rest	Mild induration in l parotitis
Martinez et al., 2007	34 male, Turkey	Sneezing	Observation, Steroids, voice rest	None
Alexander & Toyton, 2012	29 male, U.K.	Sneezing	Observation, Use of nasogastric tube, voice rest	None
Bryne et al., 2019	47 male, U.S.A.	Sneezing	Observation	Mild odynophagia
Matrka & Li, 2018	35 male, U.S.A.	Sneezing	Observation, Analgesics	None
Fenig et al., 2013	47 male, U.S.A.	Sneezing	Observation, Steroids, Antibiotics	Mild odynophagia
Reuther & Weissbrod, 2017	30 male, U.S.A.	Sneezing	Observation, Steroids, voice rest	None
Tsur et al., 2020	34 male, Israel	Sneezing	Observation, Analgesics, Antibiotics, Voice rest	Mild odynophagia
Ates et al., 2020	34 male, Turkey	Sneezing	Observation, Antibiotics, Steroids, Voice Rest	None
Sbeih et al., 2021	31 male, U.S.A.	Sneezing	Surgical Management, Antibiotics, Steroids, Voice Rest	None
Santamaria et al., 2017	36 male, Chile	Sneezing	Steroids, Voice Rest	None
Santamaria et al., 2017	32 male, Chile	Swallowing	Analgesics and Voice Rest	None
Forner et al., 2016	33 male, Canada	Sneezing	Observation, Voice Rest	None
Salguero et al., 2019	48 male, Brazil	Cough	Observation, Proton Pump Inhibitors	None
Matsuo et al., 2019	69 female, Japan	Cough	Surgical management	Tracheostomy
Balai et al., 2020	41 male, U.K.	Swallowing	Antibiotics, Abscess Drainage, Steroids, Voice Rest	None
Faden et al., 2011	38 male, U.S.A.	Sneezing	Oxygen, Steroids, Antireflux Therapy, Analgesics, Voice Rest	None
This case	35 male, Mexico	Sneezing	Steroids, Analgesics, Antibiotics, Voice Rest	None

Table 2. Previously reported cases.

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