

Significant Laryngeal Trauma following Dog Bite

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Abstract

Presentation

A woman presented following a dog bite to the neck with stridor and evolving airway compromise. She had bleeding neck lacerations and surgical emphysema.

Diagnosis

Following emergency intubation, a CT showed comminuted, displaced laryngeal fractures with surgical emphysema. Surgical exploration and panendoscopy revealed complex laryngeal fractures without significant vascular injury.

Treatment

The patient received intravenous antibiotics and tetanus prophylaxis. Surgical washout with reduction and stabilization of the laryngeal fractures was performed. A surgical tracheostomy was performed. The patient recovered well post-operatively, with return of normal laryngeal function and tracheostomy decannulation.

Discussion

Complex laryngeal fractures were sustained secondary to extrinsic crushing force of a dog bite. Such cases are rare but could be fatal if unrecognised. This case highlights the importance of early airway management and multidisciplinary care in complex neck trauma.

Introduction

Hospitalisations from dog bite injuries have almost doubled in Ireland over the past two decades.¹ The highest rate of injuries is in children under 14 years. The most common injuries are open wounds (75.9%) followed by fractures (7.3%) with associated risks of disability, psychological trauma, and anxiety. The head and neck are the second most common location of dog bite injury after upper extremities.² Almost one quarter of patients admitted in Ireland have facial wounds.¹ Severe injuries involving the airway and vascular structures are rare but potentially life-threatening.

Case Report

A 62-year-old woman sustained a dog bite to the anterior neck. The dog was a Cane Corso (unrestricted in Ireland) known to, but not owned by, the patient. The attack was reported to be unprovoked. The dog was euthanised shortly after the incident. The patient deteriorated acutely on arrival to the emergency department, developing stridor and significant oxygen desaturation. Externally were puncture wounds with controlled bleeding and diffuse surgical emphysema. The resuscitation room was prepared for front of neck access in case of a 'can't intubate, can't ventilate' scenario. Emergency intubation was performed successfully with localised oedema noted internally.

A contrast-enhanced CT neck with angiography revealed comminuted, displaced thyroid cartilage fractures, a non-displaced cricoid fracture and surgical emphysema throughout the head and neck, extending to the chest. (*Figure 1*) No vascular injury was identified. The patient was brought to theatre for surgical exploration and panendoscopy.

Exploration of the anterior neck wound showed comminuted, displaced fractures of the thyroid cartilage. These were washed out, reduced, and stabilised by suturing of the overlying perichondrium with 4'0 prolene. The lateral neck wound exploration showed no deeper injuries, narrowly missing the external jugular vein. A microlaryngoscopy was performed showing oedema of the left false cord without internal injury or mucosal disruption. The oesophagus was intact. A tracheostomy was performed, and nasogastric tube inserted.

The patient was managed in ICU and received IV antibiotics, tapering corticosteroids, and routine tracheostomy care. Post-operatively, flexible nasendoscopy confirmed vocal cord mobility, indicating retained structural and neurological function. Early rehabilitation with speech and language therapy allowed for optimal recovery and timely decannulation. Surgical emphysema resolved and the tracheostomy was decannulated.

Discussion

The management of laryngeal trauma was described by Schaefer in 1982.²⁻⁴ The later modified Schaefer-Fuhrman classification is a widely accepted framework categorizing laryngeal injuries and predicting the appropriate level of management.⁵ (*Table 1*)

Most dog bites are superficial requiring basic medical care but deeper injuries involving the airway or major vessels can be life threatening.⁶ For penetrating neck injuries, overall mortality is 3-6%, rising to 11-17% when involving the aerodigestive tract.⁷ Prompt airway control is the priority. Once the airway is secured, cross sectional imaging is crucial for assessing the extent of injury. CT is the superior imaging modality in assessing most features of laryngeal injury.⁸

The patient sustained a Grade IV Schaefer–Fuhrman injury, characterised by multiple displaced, unstable laryngeal fractures and surgical emphysema. For Schaefer-Fuhrman IV injuries, surgical tracheostomy should be considered to preserve the airway, allow adequate opportunity for rest and to establish any underlying functional deficit before considering definitive management. Adjunctive treatments include humidified oxygen, proton pump inhibitor, tapering steroids, if appropriate, to reduce oedema, and voice rest.^{6,9}

Despite an initially guarded prognosis, the patient recovered well with early restoration of laryngeal function. This demonstrates that even high-grade injuries can achieve good functional outcomes when managed promptly and systematically.

Figures:



Figure 1: Axial CT showing displaced thyroid cartilage fracture and diffuse surgical emphysema

Grade	Injury	Management
I	Minor oedema or haematoma, no fracture	Observation, supportive medical treatment
II	Non-displaced fracture, minor mucosal injury, haematoma or oedema	Panendoscopy, tracheostomy
III	Displaced fractures, vocal cord immobility, mucosal injury without exposed cartilage or severe oedema	Panendoscopy, tracheostomy, open laryngeal exploration
IV	Multiple displaced fractures, disruption of the anterior larynx, mucosal laceration or exposed cartilage, massive oedema, surgical emphysema	Panendoscopy, tracheostomy, open laryngeal exploration
V	Complete laryngotracheal separation	Panendoscopy, tracheostomy, open laryngeal exploration & laryngotracheal reconstruction

Table 1: The Schaefer–Führman classification of laryngeal injuries⁴

Declarations of Conflicts of Interest:

None declared.

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