

Traumatic Hyoid Bone Fractures: Rare but Potentially Life Threatening Injuries

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Anatomy

The hyoid bone or else hyoid is a U-shaped mobile bone situated in the anterior portion of the neck at the level of the C3 vertebra, in the angle between the mandible and the thyroid cartilage [1].

Its name is originated from the Greek word *hyooides*, which means “shaped like the letter upsilon” which represents the 20th letter in the Greek alphabet. It is composed of a body, two greater and two lesser horns and it is the unique bone which is articulated to other bones by muscles or ligaments [1]. The greater and lesser cornua fuse to body of hyoid bone between 40 and 60 years of age although non-fusion has been found even after the age of 60 years [2,3]. The latter scientific evidence is of special forensic interest as, based on the knowledge of the fusion age of the greater cornua with the body of the hyoid bone, age determination of an individual, especially of unknown dead bodies, can be achieved [2]. It should be added that fusion is not recorded in ages below 20 years [3].

The primary function of hyoid bone is to provide attachment to the tongue, the larynx and the pharynx. Because of its morphology and its position amongst the other anatomical structures of the neck, it is associated not only with the sound production and the fully articulate human speech, but also with the smooth function of the airway and possibly with the normal swallowing [1,4-6].

Hyoid Bone Fractures

Suspended from the styloid process, the hyoid bone is not susceptible to fractures owing to his inherent protection, which is secured by its safe position and reinforced by its mobility. For these reasons isolated hyoid bone fractures secondary to trauma other than strangulation are rare accounting for only 0.002% of all fractures [7,8]. They affect more frequently young individuals with a greater prevalence in the male gender [9].

Hyoid fracture following strangulation or hanging is well documented [10,11]. In a suspected case of murder, a fractured hyoid is indicative of strangulation, albeit this is not taken into consideration when the victim is a child or an adolescent, where the hyoid components are still pliable as ossification is not perfectly completed [10].

As regards the specific location of the fracture it has been postulated that this is determined by the shape of the greater cornua [12].

Non strangulation-related fractures are rare. The latter are associated frequently with other injuries such as mandible and cervical spine fractures or concomitant soft tissue lacerations [8,13]. They are the result of direct trauma or hyperextension of the neck. Several causing factors have been reported. These include motor vehicle accidents, gunshot wounds, induced vomiting, injuries from helmet straps, choke holds and trauma during athletic activities such as martial arts or basketball [6,8,9,14-20].

Commonly encountered clinical symptoms are dysphagia, odynophagia, hemoptysis and pain upon neck rotation or pain in the throat that worsens during coughing. The most frequently presented signs include anterior neck tenderness, swelling, ecchymosis, subcutaneous emphysema and crepitus, on palpation [6,8,9,21,22].

Diagnosis is usually established without difficulty using routine plain cervical X-rays in lateral orientation. Other radiologic examinations such as orthopantomographic radiograph and computerized tomography are rarely needed mainly for the purpose of excluding associated comorbidities [6,8,19]. Penetrating injuries require surgical exploration.

In any case that dyspnea, hemoptysis or bleeding from laryngeal lacerations are present, direct laryngoscopy is recommended to recognize the extent of injury, provided that cervical spine injury is absent [6,9,19,20].

Treatment of hyoid fractures is mainly conservative. In a recent review, Ramchand et al. reported surgical intervention in only 10.9% of cases, whilst the majority of these injuries were cured conservatively. In both therapeutic approaches positive outcomes were recorded [21].

Although most of the times hyoid fractures have a benign profile and are treated uneventfully, they are potentially life threatening injuries as occasionally provoke severe airway compromise [7,8,23].

Respiratory symptoms may develop quickly, therefore observation of the injured patient for minimally 48 to 72 hours is imperative [15,19].

The therapeutic approach varies in accordance with the severity of the trauma. Mild cases are treated with ice, analgesics, resting of the voice, immobilization of the neck and liquid diet for a few days [6,15,19]. In more serious fractures with soft tissue lacerations thorough wound care, removal of bone fragments or fracture fixation is of great importance. In patients with dysphagia nasogastric feeding tube is warranted. In the presence of airway compromise, endotracheal intubation or tracheostomy is mandatory [19].

Late complications following these injuries are rare and include dysphagia, crepitus by neck flexion and pseudoaneurysm of the external carotid artery [19].

Conclusion

Isolated hyoid bone fractures are rare and diagnosis is not easily made. However a sufficient degree of suspicion is needed in every case of anterior neck pain associated with soft tissue laceration or other allied injuries. The meticulous assessment will reveal the severity of the trauma. Though to the greatest extent hyoid fractures represent benign pathologies they may potentially have lethal consequences. Prompt

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care of the injured is essential. Treatment is primary conservative with typically good prognosis.

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