TRAINING INSTITUTE on STRANGULATION PREVENTION
Is a program of Alliance for HOPE International

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Dear Doctor

Q: Doctor Smock can you please tell me about the hyoid bone and hyoid fractures in strangulation victims?

A: Strangulation is the most common mechanism for hyoid bone fractures in the medical literature. The hyoid bone is a horseshoe-shaped bone located in the neck just below the level of the mandible. When the neck is flexed forward it is somewhat protected and more exposed and vulnerable when the neck is extended rearward. The bone is composed of 3 bones fused together: the two greater horns fused to the body (Photo 2). The function of the hyoid is to provide support to the muscle of the tongue and pharynx.

Photo 1

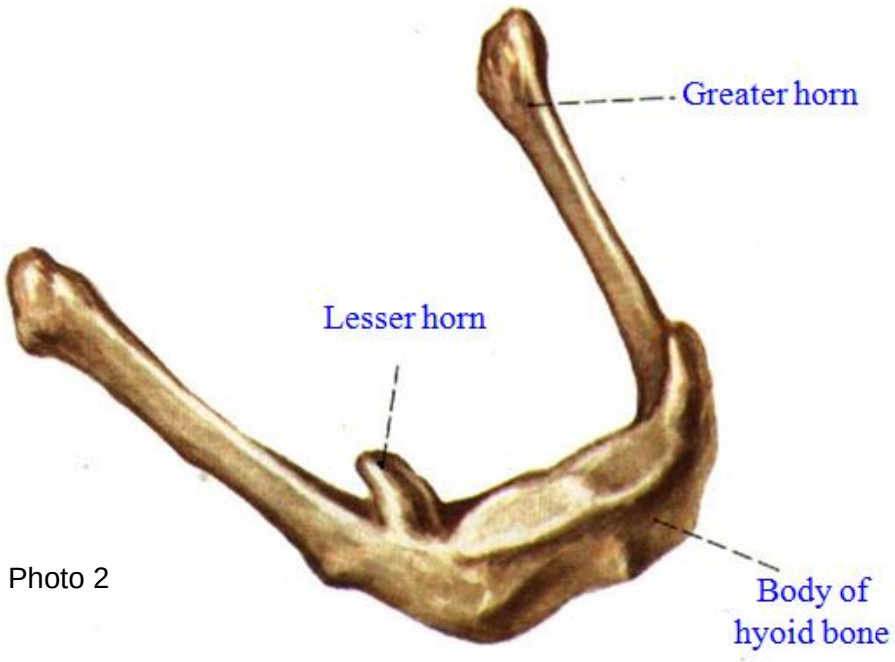

Photo 2

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Fractures of the hyoid most commonly occur with lateral squeezing of the thumb and fingers toward the midline of the neck. When lateral pressure is applied the fractures are most frequently seen along the greater horn. Fractures may also occur where the greater horn fuses with the body of the hyoid. Fractures of the hyoid body are rare, however when seen are associated with direct blows and anterior to posterior compression.

Hyoid bone fractures are more common in fatal than non-fatal strangulations. The incidence of hyoid bone and neck cartilage fractures in fatal strangulations has been reported to range from 17% to 71%. The force required to fracture the hyoid is relatively minimal. Measurements on cadaver specimens found an average of 6.87 pounds of pressure was required to produce a hyoid fracture. A sample from an elderly woman required only 2.5 pounds of pressure to produce a fracture.

The most common symptom associated with a hyoid bone fracture in the living victim is pain with swallowing. A fracture of the hyoid is commonly associated with other injuries including soft tissue hemorrhage, carotid artery tears and dissections, thyroid cartilage injuries and tracheal injuries.

Tenderness to palpation in the area just under the mandible is the most common sign of a hyoid fracture. Visible external trauma is frequently not present as the presence or absence of visible injury is primarily a function of how the pressure was applied to the neck.

Diagnosis of a hyoid bone fracture is best made with multi-slice computed tomography (MSCT). In cases with a high index of suspicion for a fracture with negative or equivocal findings on MSCT the use of micro-computed tomography (micro-CT) will be useful. Use of the MSCT and computed tomography angiography (CTA) will rule-out any associated life-threatening injuries including tracheal tears and carotid artery dissections.

Any patient with a hyoid bone fracture requires, at a minimum, an ENT consultation. This patient is at risk for additional life-threatening injuries and should not be discharged until a through evaluation, including a CTA has been completed.

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