G49 Can Mandibular Fractures Occur in Non-Oral Contact Shotgun Wounds of the Head?

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After attending this presentation, attendees will be aware of the characteristics of contact shotgun wounds of the head that do not directly involve the oral cavity, lower face, or mandible.

This presentation will impact the forensic community and/or humanity by demonstrating how mandibular fractures can occur with non- oral contact shotgun wounds of the head and that these fractures do not imply separate blunt force injury to the mandible.

Contact shotgun wounds of the head most commonly involve the oral cavity, submental region, temple, or frontal scalp. Although these wounds are usually suicides, homicides do occur. In all cases, autopsy findings should correlate with the investigation. Additional injury, such as a mandibular fracture in a contact shotgun wound to the temple region, must be explained in order to rule in or rule out the probability of separate blunt force injury.

The files of the Office of the Chief Medical Examiner (OCME) for the state of Maryland were reviewed for shotgun wounds to the head from January 1995 through June 2006. Review showed 215 total shotgun to the head cases with available records. Of those 215 cases, 133 were contact shotgun wounds to the head. According to available information, the location of the contact shotgun wounds included 26 cases (20%) that were intraoral, 49 cases (37%) with contact under the chin, 52 cases (39%) with contact at the level of the nose or above and 6 cases (4%) with contact at the side of the face at the mandible. Of the 52 cases with contact at the level of the nose or above, ten cases (19%) had mandibular fracture. Three of the ten cases (30%) were determined to be homicides and seven of the ten cases (70%) were determined to be suicides. Location of the shotgun wounds were right side of the head at the temple (3 cases), middle of forehead (2 cases), between the eyes (1 case), right eye (1 case), left eye (1 case), nose (1 case), and back of the head (1 case).

The gauge of the shotgun was known for seven of the ten cases with mandibular fractures. Six of the shotguns were 12 gauge (60%), one was a 20 gauge (10%), and three were unknown (30%). Of the 42 cases that did not produce a mandibular fracture, 21 were 12 gauge (50%), nine were 20 gauge (21.5%), three were .410 (7%) and nine were unknown (21.5%).

In a previous study by Harruff comparing the injury produced by different gauge shotguns, 20 of 89 cases (22%) of contact shotgun wounds of the head were located at the temple, scalp (above the level of the ears) or forehead. In these 20 cases, there was no reported difference in the internal features of the damage caused. The internal injuries included extensive fractures of the skull and maceration of the brain without injury to the facial structures. In contrast to the internal injuries, 12 gauge shotguns produced extensive external lacerations while larger gauge shotguns produced lacerations primarily at the site of contact. In the current study, the 12 gauge shotgun on average caused more extensive lacerations when compared to the larger gauge shotguns. However, both the 12 gauge and 20 gauge shotguns were able to cause a mandibular fracture.

In contact shotgun wounds of the head, fragmentation of the skull is caused by the increase in internal pressure of the skull due to the charge of the shot and the increase in pressure caused by the rapidly expanding gas from combustion of the propellant. It is postulated that this force is directly transmitted from the temporal bone to the mandible resulting in fracture.

This report emphasizes that mandibular fractures can occur with contact shotgun injuries at or above the level of the nose and that these injuries can occur regardless of the gauge of the shotgun. It is paramount not to report separate blunt force injury as the cause of the mandibular fractures without further investigation and autopsy findings supporting those conclusions. If there are allegations or concern of blunt force injury, then autopsy should show separate points of impact on the skin of the jaw area as evidenced by contusion, abrasion, or lacerations.

Contact Shotgun Wound, Head, Mandibular Fracture

 ** Presenting Author*