



Physical Anthropology Section – 2010

H6 Tags and Spurs: Morphological Features of Cranial Blunt Force Trauma Fractures

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After attending this presentation, the attendees will be aware of unique, morphological features observed through the examination of several forensic cases that may serve as diagnostic features of cranial blunt force traumas.

This presentation will impact the forensic community by introducing and discussing morphological features, "Tags" & "Spurs", which can be utilized to identify cranial fractures produced through blunt force traumas when complete crania or isolated cranial fragments are recovered and/or examined.

The ability to recognize, identify and interpret cranial fracture patterns is instrumental in the correct and accurate assessment of the type of trauma(s) which produced those fracture. Berryman and Symes (1998) provide a comprehensive discussion on recognizing gunshot and blunt cranial trauma through fracture interpretation, while Galloway (1999) provides a detailed discussion of blunt force fracture patterns and cranial morphology which influence their generation and propagation. Several fracture types and patterns have been documented that are frequently utilized to identify blunt force trauma (i.e., linear, depressed, stellate, ring, Le Fort, contra-coup, internally beveled concentric, etc.), however through the course of examination of several forensic cases additional morphological features have been observed which may be of diagnostic importance for blunt force trauma recognition. Presented here will be two morphological features, "Tags" and "Spurs", and the probable mechanisms of their production.

Tags are small, hinge-fracture segments of the fracture margin, found on the inner or outer table of the cranium. After a linear, radiating and/or concentric fracture has divided a cranium into several pieces there is the potential for shearing, edge-to-edge movement of the fragments internally and externally through the application of force. This shearing movement along the fracture may not be smooth and even, and occasionally the fracture margins may snag creating hinge-fracture segments as force continues to be applied.

As previously noted, internally-beveled concentric fractures are associated with blunt force traumas, with the degree of beveling appearing slight to moderate. However, occasionally localized large bevels are produced along fracture margins creating what could be termed spurs. As force is applied to a cranium and a cranial fragment is created, the internal or external movement of the fragment may produce a relatively large spur or flake of the internal table attached to the margin of the fragment or adjacent fragment. These spurs are analogous to the "break-away" spurs frequently produced at the terminal aspect of saw cuts of long bones (Symes, Berryman & Smith, 1998).

Two forensic cases will be utilized to illustrate the "Tags" and "Spurs" discussed above. Case No. 1 involves a probable Caucasian, possible Hispanic female, 30-45 years of age, with multiple blunt force traumas of the left parietal, which possesses several distinctive "tags" along fracture margins and one fragment with a moderately large "spur." Case No. 2 involves an adult, probable Caucasian, possible Hispanic female with multiple blunt force traumas of the left parietal and frontal, which produced a fragment with very large "spur" and a small "spur" along a fracture margin. Each case clearly illustrates one of these unique fracture features of blunt force trauma.

Though there are several well know and documented fracture types and patterns that can be directly attributable to either blunt or gunshot wound traumas, two additional fracture types were noted during the course of examination of forensic cases involving blunt force trauma that have not been addressed in the forensic literature (at least to this researcher's knowledge). These fractures types, "Tags" and "Spurs," appear to be unique to blunt force trauma and may serve as additional diagnostic features in the identification of blunt force trauma in complete and/or more importantly fragmentary crania.

Blunt Force Trauma, Fracture, Tag & Spur