



Pathology Biology Section – 2003

G48 Morphological Considerations of the Hyoid Bone

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This presentation will demonstrate the tremendous variation that characterizes the hyoid bone

Combining the anthropological focus upon skeletal variation with the pathological interest in trauma, this study reveals the immense variation and complexity in laryngeal structures, and dispels the common notion of a causal relationship between advancing age and fusion of the hyoid bone.

Fractures of the laryngeal structures are frequently associated with manual and ligature strangulation, although external manifestation of such trauma is not always evident. Often, assessment of the condition of the hyoid bone may merely involve palpation of the laryngeal tissues at autopsy. Unfortunately, such interpretations are plagued by the unquestioned acceptance that the skeletal elements of the hyoid bone unite with advancing age. Understandably, this erroneous consideration of the development of the laryngeal skeleton is frequently assumed in forensic interpretations.

The hyoid bone is comprised of several distinct skeletal components, the body and pairs of greater and lesser horns. However, throughout the anatomical and scientific literature the hyoid bone is traditionally described as a "U" shaped bone of a consistent form; a form that develops and fuses with advancing age. This interpretation, therefore, biases the potential anatomical, pathological, and clinical evidence that can be gleaned through examination of the components of the hyoid bone. Although the literature produced within these disciplines contains a wide variety of references to hyoid conditions, these reports suffer from a failure to recognize the variability that characterizes the human hyoid bone. Clearly, a thorough appreciation of the range of variation inherent in this structure is crucial for the accurate assessment of the hyoid in both antemortem and postmortem situations.

Toward this end 1,814 hyoid bones from individuals ranging in age from 2 months to 101 years, maintained in the Department of Anthropology at The University of Tennessee, were examined. Specimens were assessed for fusion and categorized as unfused, unilaterally fused, or bilaterally fused. Additionally, a series of measurements were performed to quantify overall size and shape. The structure of the hyoid, as revealed by the extent of fusion and overall size measurements was then compared against known age, sex, and ancestry data.

Results indicate that the hyoid is sexually dimorphic, though no significant differences exist between males and females with regard to fusion. However, age is a factor when considering a union between the body and greater horns in that among the young (0-9 and 10-19) no union occurs. There is minimal evidence for the occurrence of fusion between the body and greater horns during the third and fourth decades of life. Although an increase in the frequency of union occurs during succeeding decades, this study demonstrates that advanced age cannot be equated with fusion between the body and greater horns.

This enhanced awareness of the variability that truly characterizes the hyoid will enable more accurate pathological, anthropological, anatomical, and clinical descriptions of the hyoid in forensic settings.

Hyoid Bone, Laryngeal Trauma, Morphological Variation