



Pathology/Biology Section - 2016

H138 Anatomical Larynx Variations and Hyoid and Thyroid Fractures

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After attending this presentation, attendees will better understand anatomical variations that may influence the diagnosis of fractures of the hyoid bone and thyroid cartilages.

This presentation will impact the forensic science community by increasing awareness of the pitfalls associated with anatomical variations of the hyoid bone and the thyroid cartilage in strangulation cases, based on the prevalence of these variations established for a Galician population in northwestern Spain.

Apart from a basic anatomical background and technical skills, forensic pathologists are in general well trained in recognizing postmortem artifacts encountered during neck dissection. Unfortunately, anatomical variations as pitfalls in the interpretation of fractures of the hyoid bone and thyroid cartilage are unknown to most. This may come as no surprise, considering that forensic textbooks and forensic literature have failed to pay attention to these anatomical variations, namely with epidemiological studies assessing their prevalence.

This study was conducted on 207 consecutive autopsies looking for anatomical variations that could influence the diagnosis of larynx fractures. The cartilage triticea was confirmed as the most frequently present variation (52.7%), but different and not previously described variants were also found, such as the thyroid superior horns segmentation (11.7%), thyroid ectopic horns (8%), and thyro-hyoid lateral ossification (5.3%). Calcification of the stylohyoid ligament was the least prevalent variation found (1.4%). The names proposed for the new variants will be analyzed and discussed, with consideration given to the available literature and the probable embryologic origin from the third and fourth branchial arch.

Anatomists have described some of these anatomical variations that are of great interest to forensic pathologists. The triticea, a very small cartilage located in the thyroid-hyoid membrane, can easily be mistaken for a fracture of the superior horns of the thyroid cartilage. The unilateral absence of one thyroid horn has also been described but not associated to ectopic horns lost in the thyro-hyoid membrane. These thyroid ectopic horns also constitute pitfalls in the interpretation of fractures of the thyroid cartilage as well as the segmentation of the distal end of the superior thyroid horns. As the thyro-hyoid lateral ossification — a thick and bony direct union between the hyoid and thyroid horns — often has discontinued/interrupted points, it can also lead to mistakes in the evaluation of thyroid fractures. The consistency of the hyoid bone and thyroid cartilage in relation to the victim's age and the degree of fusion of the corpus-horns of the hyoid should also be taken into consideration in the interpretation of autopsy findings.

Forensic pathologists should be aware of the anatomical variations of the hyoid bone and thyroid cartilage and should be trained in recognizing them in order to avoid erroneous interpretation of autopsy findings. The role of X-ray and computed tomography as ancillary techniques is increasing, but the proper manual dissection, with observation and palpation of the fractures, remains the greatest tool for forensic pathologists, whose importance will be reinforced.

Despite the tremendous importance of correct interpretation of anatomical variations in the identification of fractures of the neck structures in strangulation, this issue has not yet been properly discussed in the forensic literature, especially in terms of epidemiologic relevance. This presentation seeks to fill this gap.

Cartilage Triticea, Thyro-Hyoid Lateral Ossificati, Thyroid Ectopic Horns