H32 Sex Estimation Using the Petrous Portion of the Temporal Bone By Linear Regression Anaylsis

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After attending this presentation, attendees will understand how the petrous portion of the temporal bone can be used to identify sex in fragmented skeletal remains.

This presentation will impact the forensic science community by giving the forensic anthropologist another method to estimate sex in fragmented skeletal remains and provide a jumping-off point for further evaluation of the use of the petrous portion of the temporal bone in sex estimation.

When bodies are heavily decomposed, chances increase that not all of the remains will be recovered. Lengthy postmortem intervals seen in heavily decomposed or skeletonized remains can impact identification efforts because essential bones for a biological profile may not be recovered due to human, animal, and environmental factors. A number of taphonomic processes that affect skeletal recovery include human and environmental processes, such as disfigurement of dead bodies, dismemberment to prevent positive identification, animal scavenging, and environmental disbursement. Since recent forensic anthropological studies have shown a metric relationship between temporal bone morphology and sex, this study investigates the quantitative relationship of seven measurements of the temporal and occipital bones and sex. 304 crania from the Bass Collection were measured for this study, including
92 females and 212 males. This study used the following seven measurements: (a) mastoidale to porion; (b)porion to asterion; (c) asterion to mastoidale; (d) asterion to the intersection of the parietal, temporal and sphenoid (PST); (e) PST to mastoidale; (f) the length of the petrous portion from the foramen lacerum (fl) to the mastoidale; and (g) from the mastoidale to basion. The base of the petrous portion (from its most anterior point in the foramen lacerum to the mastoidale) is an insertion point for the *levator veli palatini*. This muscle elevates, retracts, and laterally deviates the soft palate, and opens the auditory tube during swallowing. So the length of the base of the petrous portion may be larger in males because they have more robust muscle attachments than females. Five regression formulae were developed using these seven measurements of the temporal and occipital bones. The fifth regression equation [0.539 (fl-ms) + 0.265 (ms-po) + 0.157(ast-ms) - 4.137] is statistically significant to determine sex in a fragmented skull. This formula correctly identified sex in 88% of the cases used for this study. Three measurements taken on petrous portion of the temporal bone can be used to identify sex in skeletonized and fragmented remains:
(1) the length of the petrous portion from the foramen lacerum to the mastoidale; (2) from the mastoidale to the porion; and (3) from the asterion to the mastoidale. This demonstrates the forensic value of the length of the petrous portion in sex identification in fragmented skeleton remains.

Sex, Petrous Portion, Linear Regression

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