

MORPHOLOGICAL VARIABILITY OF THE CRANIOVERTEBRAL JUNCTION IN A HISTORICAL ITALIAN SKELETAL COLLECTION: INSIGHTS FROM THE ROMA SERIES

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Background: The craniovertebral junction (CVJ) is a complex region that balances mobility, stability, and protection of vital neurovascular structures. This study synthesizes findings from investigations of the historical ROMA skeletal series (Museum of Anthropology “Giuseppe Sergi,” Sapienza University of Rome), examining variation in the foramen magnum, occipital condyles, atlas occipitalisation, and proatlant-related anomalies.

Materials and methods: The analyses were performed on adult human crania dating from the 17–19th centuries. Standard anthropological methods were used for sex and age assessment. Macroscopic and morphometric examinations included measurements of the foramen magnum and occipital condyles, assessment of bilateral asymmetry, evaluation of hypoglossal canal morphology, and identification of rare craniovertebral anomalies such as atlanto-occipital fusion, precondylar tubercles, and third occipital condyles.

Results: The craniovertebral region displayed marked morphological variation. The foramen magnum showed diverse size and shape, while occipital condyles exhibited weak sexual dimorphism and mainly developmental asymmetry. Rare anomalies included atlas occipitalisation, precondylar tubercles, and third occipital condyles, supporting the developmental role of the proatlant in craniovertebral morphology.

Conclusions: The ROMA skeletal series provides valuable evidence of craniovertebral variation in a historical European population. These findings enhance understanding of cranial base development and underscore the value of museum collections for documenting human skeletal diversity, with important implications for radiological and surgical practice.

Keywords: Craniovertebral junction; Occipitalization of the atlas; Third occipital condyle; Precondylar tubercle; Asymmetry.

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