

THE SIGMOID NOTCHES OF THE PROXIMAL SEGMENT OF ULNA: INFERENTIAL MORPHOMETRY AND VOLUMETRY

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Objective: The elbow joint is compound joint that can be affected by several pathologies that may require medical and surgical interference. This experimental analysis aims to infer data about the morphometry of the proximal segment of the ulna and its articular surfaces represented by the greater sigmoid notch (trochlear notch) and lesser sigmoid notch (radial notch).

Methods: A sample of 50 ulnae (n=50, 27 right and 23 left) was studied in connection with the surface area of the sigmoid notches (SA), weight of ulna, and the volume of proximal portion of ulna (the olecranon process down to inferior margin of the radial notch), and the length of ulna (L). Longitudinal dimensional parameters were also studied including; the straight distance between the highest point (tip) of the olecranon and that of the coronoid process (OCD), and the mid-olecranon thickness in mediolateral (T1) and anteroposterior orientation (T2).

Results: It is inferred that there were no significant differences in between right versus left ulnae and about the majority of morphometric parameters with an exception for OCD (22.47 vs. 20.75, p-value=0.002). There was a positive correlation in between all the parameters, although the strongest associations were observed in between OCD, the area of the trochlear notch, and the weight of ulna.

Conclusion: Key findings of this study are valuable to biomedical engineers, medical professionals including orthopaedic surgeons and rheumatologists, evolutionary biologist, and physical anthropologist. Data from this study apply to (reverse) engineer the perfect implant for the elbow joint.

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