

Morphometric Study of Proximal Humeri in a Sri Lankan Population

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Introduction

Humeral head diameter(HHD) and angle of inclination(AI) are important parameters during shoulder reconstruction and prosthetic replacement while differences in placement of the greater tuberosity can have an impact on postoperative range of movement.

In forensic anthropology, humeral osteometric measurements are important in estimating height of an individual.

There is minimal data available in Sri Lankan population on above subject

Methods

Forty-eight(left28:right20) humeri, donated for teaching and research purposes to Department of Anatomy, University of Sri Jayawardenepura were analyzed. Humeri were stabilized in anatomical position by a fixator board. Measurements were taken by a digital Vernier calliper in millimetres up to 2 decimal points by two independent individuals and mean value was taken. Angle of inclination was measured by 360° Dial Universal Bevel Protractor.

Results

HHD was 42.24 ± 3.7 mm. Majority(60.4% [29/48]) ranged between 41-46mm. Left HHD had twice the standard deviation(42.14 ± 4.32 mm) than right(42.39 ± 2.87 mm).

Mean distance between most proximal points on humeral head and greater tuberosity(AB) was 4.93 ± 1.62 mm[right side- 5.10 ± 1.73 mm and left side- 4.81 ± 1.56 mm]. Majority 52% (25/48) ranged between 4-6mm.

AI ranged from 104.55° - 149.05° and mean was $131.5^\circ \pm 6.91^\circ$ [right side- $131.5^\circ \pm 6.91^\circ$ and left side- $130.21^\circ \pm 8.42^\circ$].

Majority(37.5% [18/48]) of Humeral length(HL) was between 300-340mm. Mean was 307.90 ± 16.50 mm[right side- 308.30 ± 15.90 mm and left side- 307.50 ± 17.2 mm].

Discussion and Conclusions

These measurements are important in cases of proximal humeral fractures, which extend along the epiphysial lines of the proximal humerus and its segments, causing their displacement to various degrees and in the fracture management.

The study also helps in forensic and archeological fields to identify unknown bodies and to create reference ranges for Sri Lankan population.