Morphometry of Adult Humerus Bone in a Sri Lankan Population

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Background

Humeral head diameter(HHD) and inclination angle(IA) are important parameters during shoulder reconstruction and prosthetic replacement. Differences in placement of the greater tuberosity have an impact on postoperative range of movement. Increasing incidence of comminuted osteoporotic distal humeral fractures will result in greater utilization of elbow arthroplasty in future.

In forensic anthropolgy ,humeral osteometry is important in estimating height of an individual.

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

Aim

To study the osteometry of proximal and distal humeri in a Sri Lankan population.

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^{o} Dial Universal Bevel Protractor.

Results

Mean HHD was 42.24±3.7mm. Majority(60.4%[29/48]) ranged between 41-46mm. Left HHD had twice the standard deviation(42.14±4.32mm) than right(42.39±2.87mm).
Mean distance between most proximal points on humeral head and greater tuberosity(AB) was 4.93±1.62mm[right side-5.10±1.73mm and left side-4.81±1.56mm]. Majority 52%(25/48) ranged between 4-6mm.

AI ranged from 104.55^{o}-149.05^{o} and mean was 131.5^{o}±6.91^{o}[right side-131.5^{o}±6.91^{o} and left side-130.21^{o}±8.42^{o}].

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

Mean distance between most distal and most proximal points along the edge of olecranon fossa(PQ) was 18.70 ±2.35mm[right side-18.83±2.14mm and left side-18.60±2.52mm]. Majority ranged between 19.00-20.99mm(14/48).

Mean distance between most distal point of trochlea and most distal end of olecranon fossa(RS) was 16.44±1.95mm[right side-15.82±1.75mm and left side-16.89±2.00mm]. Majority ranged between 15.00- 16.99mm(17/48).

Conclusions

This study helps in forensic and archeological fields to identify unknown bodies as well as for surgeons for reconstruction of proximal and distal humeral fractures.