GROSS OSTEOLOGICAL STUDIES ON THE HUMERUS OF LEOPARD (*Panthera pardus*)

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Abstract

A study was carried out on the humerus of two leopards (Panthera pardus). It presented a shaft and two extremities. The shaft had four surfaces – medial, lateral, cranial and caudal. The lateral surface had a shallow musculospiral groove. The medial surface was nearly straight. Teres major tuberosity was not prominent. In the cranial surface the crest of humerus presented a low ridge the deltoid tuberosity. The proximal extremity consisted of an oval head, an intertuberal groove and greater and lesser tubercles. At the distal extremity, the humeral condyle was divided into small lateral capitulum humeri and large medial trochlea humeri. They articulated with the radius and the ulna respectively to form the elbow joint. The medial and lateral epicondyles were located caudoproximal to the margins of trochlea and capitulum humeri respectively. Immediately above the medial epicondyle a slit like supracondylar foramen was noticed. The radial and olecranon fossa occupied the cranial and caudal parts of the distal extremity of humerus respectively.

Key Words : *Humerus, anatomy, leopard.*

The bone of brachium, humerus is the largest bone of the thoracic limb. It articulates with scapula proximally forming shoulder joint and the bones of forearm, radius and ulna distally forming elbow joint (Nickel *et al.*,1986). Gross anatomical observations made on the humerus of leopard are scanty. Hence the present study was undertaken.

Materials and Methods

The present study was carried out on the humerus of two male leopards aged five years received from the Department of Forest, Muthanga, Government of Kerala, for post-mortem examination. The forelimb was separated from the trunk and the bones were macerated and prepared according to the methods of Young (1980).

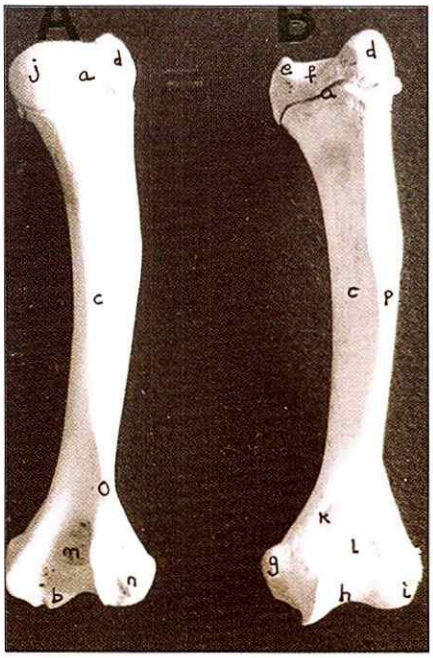
Results and Discussion

The humerus measured 22.5cm long and presented a shaft and two extremities (Fig.). The proximal-third of the shaft was compressed laterally and distal third cranio-caudally. It had four surfaces *viz.* medial, lateral, cranial and caudal as observed in dogs by Evans and Christensen (1979) and lioness by Joshi *et al.* (2000). The circumference of the shaft at the proximal, middle and distal regions was 9.7 cm, 7.6 cm and 8 cm respectively with an average value of 8.43 cm.The lateral surface was smooth and presented a shallow musculospiral groove as reported in lioness (Joshi *et al.*, 2000). Medial surface was nearly straight in its length. A teres major tuberosity was present on its medial surface, but was not as prominent as seen in dogs (Evans and Christensen, 1979). The nutrient foramen was situated in the distal-third at the junction between the medial and caudal surfaces. The cranial surface was triangular and rough proximally, narrow in the middle forming the crest of humerus and smooth and flattened distally. The crest of humerus presented a deltoid tuberosity at the junction between the proximal and middle-

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third of the shaft in the form of a low ridge. From the deltoid tuberosity a rough tricipital line extended caudally towards the greater tuberosity. The revelation of a very slight elevation in this line called teres minor tubercle just below the greater tubercle was corroborated by the findings of Kunzel *et al.* (1998) in the cheetah. The caudal surface extended from the neck of humerus and was rounded in the proximal two-third but smooth and flattened distally. The distal third of this surface continued as the lateral epicondyloid crest. These findings are in accordance with the reports of Smith (1999) in dogs and cats.

Fig. Humerus of Leopard
A. Caudal View B. Cranial View



a. Proximal extremity
b. Distal extremity
c. Shaft
d. Greater tubercle
e. Lesser tubercle
f. Intertuberal groove
g. Medial epicondyle
h. Trochlea humeri
i. Capitulum humeri
j. Head
k. Supracondylar foramen
l. Coronoid fossa
m. Olecranon fossa
n. Lateral epicondyle
o. Lateral epicondyloid crest
p. Crest of humerus

The proximal extremity consisted of the caudally directed oval head, which occupied two-thirds of the proximal end and the greater and lesser tubercles. The articular area of the head continued on to the craniomedial aspect as the intertuberal groove. This groove was broad and undivided as observed in adult lioness by Joshi *et al.* (2000). The articular head was strongly curved from before backwards and was separated from the shaft by a distinct neck.

The greater tubercle or large cranio-lateral projection of the proximal extremity of humerus was undivided. Its summit extended a little above the level of the head. The lateral tuberosity extended forwards and displaced the intertuberal groove to the medial aspect. Between the head and the greater tubercle several small foramina were seen for the transmission of veins. On the lateral surface of greater tubercle a shallow depression for infraspinatus muscle, *fascies infraspinatus* could be recognized similar to the findings of Kunzel *et al.*(1998) in cheetahs. The lesser tubercle was medial, nodular and undivided as in dogs (Budras *et al.*, 1994) and lioness (Joshi *et al.*, 2000).

At the distal extremity, the condyle of humerus was sagitally rounded and divided into a small lateral articular area, the capitulum humeri, for articulation with the radius and the medially located, much larger, trochlea humeri, which adjoined the ulna. These are in agreement with the findings of Kunzel and Probst (1998) in cheetah and Smith (1999) in dogs and cats. On the lateral aspect, the condyles showed shallow depressions and large tubercles for ligamentous attachments. The enlarged distolateral end of the humerus, the lateral epicondyle, was located caudal and proximal to the lateral articular margin of capitulum. From this lateral epicondyle, the lateral epicondyloid crest extended proximally. The medial epicondyle was larger than the lateral. Immediately above it a slit like supracondylar foramen was noticed. Contrary to this, in dogs, Smith (1999) noticed a rounded foramen, the supratrochlear foramen in the thinner central region immediately above the humeral condyle. The olecranon fossa was a deep excavation of the caudal part of the distal extremity of humerus. On the cranial part a shallow radial fossa or coronoid fossa as reported in lioness by Joshi *et al.* (2000) was noticed. However in dogs the coronoid fossa was absent. (Evans and Christensen, 1979).

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