MORPHOLOGICAL STUDIES ON THE FEMUR AND PATELLA OF SAMBAR DEER (*Cervus unicolor*)

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ABSTRACT

Sambar deer is a herbivorous ruminant which is common in the forest hill sides. The study was conducted on the femur and patella of three sambar deer. The femur had an average length of 22 cm and its slender shaft was curved cranially especially in the distal third. The cranial surface presented one nutrient foramen in the proximal third. The caudal surface showed a prominent lateral femoral lip and a well developed supracondylloid fossa. The proximal extremity was made of a medially placed head and two trochanters. The strongly convex, medially projected head showed caudomedially a shallow fovea capitis. The summit of laterally placed greater trochanter was placed in level with the head. The lateral and medial condyles of distal extremity had average length and breadth of 5.7 cm and 3.3 cm; 3.8 cm and 2.0 cm respectively. The smooth wide cranial trochlear groove had a length of 5 cm and a breadth of 2.9 cm. The medial trochlear ridge was more prominent than the lateral one. The patella was ovoid, long and narrow with an average length and breadth of 3.5 cm and 2.5 cm respectively. The caudal smooth articular surface showed a blunt sagittal ridge.

Key words: Morphology, Femur, Patella, sambar deer

INTRODUCTION

Sambar deer is a herbivorous ruminant which is common in the forest hill sides. Femur is the largest and strongest long bone which acts as supporting lever and for the forward propulsion of the body. Information on the anatomical peculiarities of the animal is scanty. Hence the study was undertaken to elucidate the anatomical features of the femur and patella in this species.

MATERIALS AND METHODS

Femur and patella were collected from three sambar deer died of natural causes and brought to the Department of Pathology for postmortem examination. Bones were processed (Raghavan, 1964) for studying the morphological and the morphometrical features. Various morphometrical parameters were taken by a measuring scale, silk thread and Vernier calipers.

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RESULTS AND DISCUSSION

The femur had an average length of 22 cm and comprised of a slender shaft, a proximal extremity and a distal extremity (Fig. 1). The shaft was curved cranially especially in the distal third as in small ruminants (Nickel et al., 1986). The shaft had an average circumference of 8 cm, 6.5 cm, and 8.4 cm at the proximal, middle, and distal third respectively. It was cylindrical in the middle and prismatic distally. The cranial, medial, and lateral surfaces were continuous and smooth. The cranial surface presented one nutrient foramen in the proximal third. The caudal surface was nearly flat and the facies aspera of its middle third was bounded by the prominent lateral and faint medial femoral lips. This agrees with the findings of Getty (1975) in small ruminants but disagrees with that of Nickel et al. (1986) who stated that both femoral lips are absent in ox. At the distal end a well-developed supracondylar fossa was present between the lateral femoral lip and the lateral epicondyle resembling large ruminants (Nickel et al., 1986). He also opined that in small ruminants instead of a supracondylar fossa a supracondylar tuberosity was present.

The wide proximal extremity consisted of a head, neck and two trochanters (Fig. 1). The strongly convex head projected more medially as in small ruminants (Nickel et al., 1986). A shallow fovea capitis was located caudomedially on the head for the attachment of the round ligament of hip. However Getty (1975) reported that in ruminants fovea capitis located in the middle of the head. The neck is distinct as in smaller species (Dyce et al., 1996).

Lateral to the head, the proximal extremity presented the massive undivided trochanter major (Hyman, 2004) and its summit was placed almost in level with that of the head as reported by Dyce et al. (1996) in smaller animals. But this finding disagrees with Nickel et al. (1986) who stated that in large ruminants the greater trochanter was located at a higher level than the head. As in small ruminants sagittal ridge like extension of trochanter major was indistinct. The medial surface of the greater trochanter was excavated to an extensive deep trochanteric fossa. The shaft presented a small protuberance, the trochanter minor at the proximal third of its caudomedial aspect. The intertrochanteric crest was well developed.

The distal extremity consisted of disto-caudally projected two large rough condyles and a cranial trochlea (Fig. 1). The lateral and medial condyles of distal extremity had average length and breadth of 5.7 cm and 3.3 cm; 3.8 cm and 2.0 cm respectively. Between the two condyles, a broad, oblique, rough and wide inter-condylid fossa was present as in small ruminants (Nickel et al., 1986) and was separated from the popliteal surface by the inter-condylar line. The smooth wide troclear groove had a length of 5 cm and breadth of 2.9 cm. It was bounded by two parallel sagittal slightly oblique ridges - the medial and the lateral - of which the medial one was more prominent. This feature is similar to that of large ruminants where the medial ridge is more prominent and disagrees with small ruminants where both ridges are equal (Getty, 1975; Nickel et al., 1986). The lateral condyle showed deep extensor fossa and shallow popliteal fossa.

The patella was ovoid, long and narrow as in small ruminants (Getty, 1975) with an average length and breadth of 3.5 cm and 2.5 cm respectively. The broad base was directed upwards while blunt and elongated apex directed downwards. The cranial surface was convex and rough while the caudal smooth articular surface showed a blunt sagittal ridge as in large ruminants (Nickel et al., 1986). But in small ruminants the caudal surface of patella was concave transversely.

The present study showed that Sambar deer, a wild ruminant, shows anatomical features of both small and large domestic ruminants.
REFERENCES


Figure 1

Femur and patella of sambar deer-cranial view. H-Head, TM- Trochanter major, S-Shaft, LE-Lateral epicondyle, P-Patella