

COMPARATIVE GROSS ANATOMICAL STUDIES OF THE SKULL OF ONE-HUMPED CAMEL (*CAMELUS DROMEDARIUS*)

R. U. Shahid and R. Kausar

*Department of Veterinary Anatomy,
University of Agriculture, Faisalabad, Pakistan***ABSTRACT**

The skull of camel when viewed from above was irregularly pentagonal in outline. It was widest in the frontal region and contained the orbits laterally. The occipital bone formed the entire nuchal surface and encroached upon the dorsal surface about 1.75 to 2 inches. It joined the parietal bone at transverse suture. A rough transverse ridge separated the parietal and nuchal surfaces. The mastoid foramen was very large and situated in a deep fossa in the occipital bone in contrast to ox, where it lay at the junction of occipital and temporal bones. The cornual processes were absent. The supraorbital foramen was in the form of a deep fissure, at the rostrolateral margin of the orbit. There was no maxillary tuberosity and facial crest. The premaxilla had a dorsomedially concave and narrow pointed body. The nasal bones were notched rostromedially and nasal apertures were oval in outline. The body of mandible was long, narrow and concave dorsomedially. The intermandibular space was "V" shaped. The vertical ramus of mandible was thin and convex caudally and the angles were not pronounced, while the rostral border was thick and wide. The coronoid process was almost straight with caudal end slightly pointed. The condyloid process was large and its dorsal surface contained the extensive articular surfaces, which were convex. There was a shallow mandibular notch. The mandibular foramen was in the middle of the medial surface of the ramus of mandible.

Key words: Camel, skull, gross anatomy.

INTRODUCTION

The skull is the most important, complex and specialized part of the skeleton. It lodges the brain, horns and the sense organs for hearing, equilibrium, sight, smell and taste. In addition to providing the attachment for the teeth, tongue, larynx and a host of muscles, it also contains pituitary gland. The anatomical features of skull vary among domestic animals. The literature on comparative anatomical aspect of skull of camel is limited. Therefore, comparative anatomical features of skull among different domestic animals have been presented in the present paper.

MATERIALS AND METHODS

The skulls of different domestic animals including camel, ox, horse, dog and cat were collected from local abattoir and from the animals brought for dissection in the laboratory, Department of Veterinary Anatomy, University of Agriculture, Faisalabad. After skinning, the bones were cleaned, macerated, processed and prepared for study, as describe earlier (Young, 1980).

RESULTS AND DISCUSSION

In domestic animals included in this study, dorsal surface of the skull could be divided into cranial and facial regions. It was in the form of a four sided pyramid, the base of which was nuchal surface and the apex was the most rostral part of the face.

The nuchal surface

This surface was formed by squamous and lateral parts of the occipital bone in the camel, ox, horse, dog and cat. In ox, the parietal and interparietal bones were located on nuchal surface and this surface was separated from the roof by nuchal crest. The nuchal crest continued forward as temporal crest which separated the nuchal surface from the lateral surface of the skull in all animals except in the horse. In camel, nuchal surface was parabolic in shape, while in ox it was extensive pentagonal in outline and at about its center was the external occipital protuberance. From this a median occipital crest extended towards the foramen magnum.

The external occipital protuberance was absent in cat, as the nuchal ligament was absent in this species. The external sagittal crest was situated in parietal

region in equines, cats and brachiocephalic dogs but absent in ruminants and doliocephalic dogs. The orbits were complete in ox and horse and incomplete in dogs.

Occipital bone

In camel, the occipital bone formed entire nuchal surface and encroached upon the dorsal surface about 1.75 to 2 inches. It joined the parietal bone at transverse suture. The parietal and nuchal surfaces were separated by a rough transverse ridge. The mastoid foramen was very large and was situated in a deep fossa in the occipital bone in contrast to ox, where it lay at the junction of occipital and temporal bones (Getty, 1975). The sphenoid, ethmoid and parietal bones resembled that of ox (Sisson and Grossman, 1985)

Frontal bone

The frontal bone of camel was wider than its length and contained orbit at its rostralateral margins and the cornual process was absent. The supraorbital foramen was in the form of a deep fissure, at the rostromedial margin of the orbit. The supraorbital foramen was at the root of the zygomatic process in equines and was absent in carnivores. In ruminants, it lay medially on frontal surface and was often double.

The middle part of frontal surface was depressed in cats and dogs to form the frontal fossa. The zygomatic arch was reinforced from above by the zygomatic process of the frontal bone and this was not the case in dogs. The orbit was formed by lacrimal, zygomatic and frontal bones in ruminants and dogs. In the horse, zygomatic part of temporal bones was also involved (Bone, 1988). The orbit had a complete rim in ruminants, whereas there was a dorsolateral gap in carnivores which was closed in life by orbital ligament. There were several small sized foramens present in the middle of the frontal bone for the small vessels.

Temporal bone

The temporal bone of camel resembled that of ox. The infraorbital foramen was present in the maxilla bone just above the level of 2nd cheek tooth. There was no maxillary tuberosity and facial crest, as these were present in ox and horse, respectively.

Premaxilla bone

The Premaxilla bone had a dorsomedially concave and narrow pointed body in camel. In horse, it was covered downward and in ox it was straight (Sisson and Grossman, 1985). The palatine fissures of camel were very narrow and outwardly diverging and the pterygoid was broad above and narrow below. The nasal bones were notched rostromedially in camel and ox.

Lacrimal, malar and maxillary bones

In camel, the lacrimal bone was quadrilateral and elongated in outline, rostral to the orbit, it had a deep lacrimal fossa having a lacrimal canal. The malar bone formed the ventral and caudolateral margin of the orbit. The maxilla was very extensive and high in ox and camel. It was concave rostrally and convex posteriorly.

Mandible bone

In camel the mandible bone was the largest bone of the skull, consisting of two symmetrical halves which were united rostrally forming the body of the mandible, as in horse (Getty, 1975). The body was long and narrow, concave dorsoventrally and having four alveoli for incisor teeth and a canine about 1.25 inches caudal to the fourth incisor (Smuts and Bezuidenhout, 1987). The ventral border of the mandible was straight as in goat and alveolar border contained five alveoli for lower cheek teeth with their size increased from the first to the fourth. The fifth molar was considerably small. The lateral surface was convex from above downward. The intermandibular space was "V" shaped. The vertical ramus of mandible was thin and convex caudally and the angles were not pronounced. The rostral border of ramus was thick and wide.

The coronoid process was almost straight with caudal end slightly pointed. In the horse coronoid process was thin transversally and curved slightly medially and backward.

In ox, it was curved backward. In dog it was very extensive and was bent slightly outward and backward. Symphysis mandibulae was absent in horse and present in dog and ruminants. The condyloid process was large and its dorsal surface contained extensive articular surface in camel, concave in ox. There was a shallow mandibular notch. The mandibular foramen was in the middle of the medial surface of the mandible as in ox and dog and it was further forward in the horse.

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