

GROSS ANATOMY OF THE FIRST RIB OF WHITE BENGAL TIGER (PANTHERA TIGRIS TIGRIS)

S. P. INGOLE¹, D. CHAURASIA and S. JOGI

Department of Veterinary Anatomy and Histology, College of Veterinary Science
Indira Gandhi Agricultural University, Raipur, Durg-491 001 (C.G.)

SUMMARY

Gross anatomical study was undertaken on first pair of rib of an adult 13-years old White Bengal Tiger (*Panthera tigris tigris*). The rib had proximal bony portion (os-costale) comprising of a body and two extremities and a distal cartilaginous portion (cartilagio-costalis). The body (corpus costae) was constricted in middle and expanded at the extremities. A faint ridge divided the articular surface of head into two articular facets. The caudal part of the neck joined the body and presented a deep distinct fossa, dorsally. The tubercle had a prominent lip at its margin. A prominent ridge descended from the tubercle on the body of the rib.

Key words: First rib, White Bengal tiger

The White Bengal Tiger (*Panthera tigris tigris*) is one of the important breeds of India developed for attracting visitors and has been declared as one of the endangered species. Efforts are on for conservation of tiger population which is decreasing very fast in India. The literature lacks the description of the first pair of rib in tiger. The pair of the first rib forming the lateral wall of the thoracic inlet was studied for gross anatomical details.

A pair of first rib was collected during the post-mortem examination of a 13-year old White Bengal Tiger that died in the zoo (Bhilai, Chattish Garh). The bone was macerated, cleaned, processed and prepared for study (Young, 1980).

The first rib showed proximal bony portion (os-costale) and a distal cartilaginous portion (cartilagio costalis) (Fig 1) as described by Sisson and Grossman (1962), Nickel *et al.* (1986), Budras *et al.* (1994) and Dyce *et al.* (1996) in dog. The bony portion of the rib had a body and two extremities. The body (corpus-costae) was constricted in middle and expanded at the extremities. However, an enormous increase in width of rib was reported in proximal to distal direction in other species like ox, horse and pig (Sisson and Grossman, 1962). Its length was 9

cm. The body was prismatic in proximal $\frac{2}{3}$ rd part and compressed in distal $\frac{1}{3}$ rd part between its lateral and medial surfaces. The body presented a concave cranial border. The proximal prismatic part had medial, lateral and caudal surfaces. The lateral and caudal surfaces were separated by a prominent ridge which, descended from the lateral surface of the tubercle. The presence of such ridge has not been described in any domestic species. After the disappearance of the ridge, the lateral and caudal surfaces merged together to form the single lateral

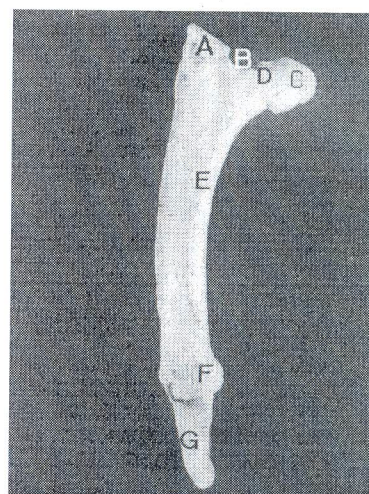


Fig 1. Left first rib of White Bengal Tiger (caudal view)
A- tubercle, B- fossa, C- head, D- neck, E- body,
F- distal extremity, G- costal cartilage

¹ Corresponding author

surface. From the site of disappearance, the convex caudal border became prominent in the distal 1/3rd of the body. The smooth medial surface was concave vertically and convex cranio-caudally having a nutrient foramen in its proximal part. The middle third of the body presented a smooth faint oblique groove laterally for the passage of the axillary artery.

The vertebral or proximal extremity had a head, neck and tubercle (Fig 1). The articular surface of the head (caput-costae) was elliptical and convex with a maximum diameter of 1.42 cm and minimum of 1.15 cm. A faint ridge was seen separating the surface into two articular facets (facies articulares capitis-costae cran. *et* caud.). The cranial facet was smaller than the caudal one. The caudal facet was directed medio-dorsally. The neck (collum-costae) was prominent (Fig 1) and measured 1.8 cm in length. It proximally joined the body at an angle of 70 degree. The cranial part of the neck was rough and tubercular, whereas the other parts were smooth. The present observation was in partial agreement with earlier description by Sisson and Grossman (1962). The caudal part of the neck which joined the body showed dorsally a deep distinct fossa for the attachment of the costotransverse ligament (Fig 2). The fossa had several foraminae. The presence of fossa has not been reported in any other species. This fossa may provide an additional strength to the first costovertebral articulation and thereby the thoracic inlet. A large tubercle (tuberculum costae) projected caudally at the junction of the neck and the body (Fig 1). It had an elongated elliptical articular facet (facies articulares tuberculi costae) which was convex cranio-caudally and flat transversely. The margin of the facet projected in the form of a prominent lip. The other part of the tubercle was rough and sinuous for attachment of the iliocostalis and longissimus muscles. A prominent ridge descended from the tubercle on the body of the rib.

The distal or sternal extremity was thick, enlarged and wide which formed costo-chondral junction with the costal cartilage. The articular surface of this extremity was convex and rough

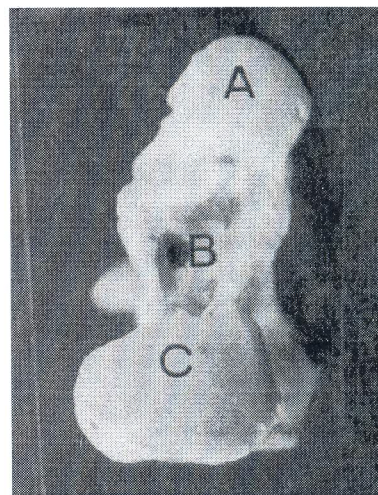


Fig 2. Left first rib of White Bengal Tiger (dorsal view of proximal extremity)
A- head, B- fossa, C- tubercle

with reciprocal projections to receive the concave articular surface of the costal cartilage. The costal cartilage (cartilagio-costalis) was flattened between its lateral and medial surfaces (Fig 1). Its length and width measured 3.35 cm and 1.65 cm, respectively which amounted 1/3rd of the bony part of the rib (os-costale) length.

Acknowledgements

The authors are deeply indebted to the authorities of Zoo Management, Bhilai for providing the experimental material for study purpose. All the material was burnt after use in order to check any misuse.

REFERENCES

- Budras, K.D., Fricke, W. and Mc-Carthy, P.H. (1994). *Anatomy of the Dog- An Illustrated Text.* pp 4. (3rd edn.) Mosby-Wolfe, London.
- Dyce, K.M., Sack, W.O. and Wensing, C.J.G. (1996). *Text Book of Veterinary Anatomy*, pp 41-43 (2nd edn.) W. B. Saunders Co., Philadelphia.
- Nickel, R., Schummer, A., Seiferle, E., Frewin, J., Wilkens, H. and Wille, K.H. (1986). *The Locomotor System of the Domestic Mammals.* pp.34-35. (5th edn.) Verlag Paul Parey, Berlin.
- Sisson, S. and Grossman, J.D. (1962). *The Anatomy of the Domestic Animals.* pp.42, 189. (4th edn.) Asia Publishing House, New Delhi.
- Young, H. (1980). Preparation of skeletal specimen. *Equine Pract.* 2: 29-32.