A RARE CASE OF OCCIPITAL PROCESSES IN A NIGERIAN SHEEP

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ABSTRACT
The report of the occurrence of the occipital process is rare in the literature. We report a case of two hard osseous processes (left and right) on the skull of a Yankasa breed of sheep. The length and width of the processes were measured using a digital Vernier caliper and the skull radiographed. The processes were attached to the external occipital protuberance. The left occipital process was longer and wider than the right, the length and width of the left occipital process measured 1.5cm and 0.5cm respectively while the length and width of the right occipital processmeasured 0.5cm and 0.3cm respectively. The processes were hard and osseous on gross examination but appeared radiolucent on radiography, as such it can be classified as a radiolucent bone and this is to the best of our knowledge the first report in the literature of an occipital process and bone lucency in a sheep skull.

Key words: Occipital, Process, Yankasa, splanchnic, Sheep

INTRODUCTION
The skull consists of several bones including the occipital bone which is frequently studied in procedures of sex determination in forensics or anthropology (Bruenner *et al*., 2002). The occipital bone forms the most caudal portion of the skull and the foramen magnum, it accommodates part of the brain and it has a caudocranial fossa which encloses the pons and medulla oblongata (Dyce *et al*., 2017). Numerous studies have reported that the occipital bone also has external occipital protuberance which provides muscle attachment sites for the nuchal ligament and paracondylar process which provides attachment sites for muscles of the head (Lafci Fahrioglu *et al*., 2020). There is however a dearth of information in the literature on the occurrence of external occipital protuberance variations in domestic animals. We present here an occurrence of a rare case of two processes articulated on the external occipital protuberance of a Yankasa sheep in Nigeria.

Case Report
During a comparative study of skulls of different Nigerian breeds of sheep at Usmanu Danfodiyo University Veterinary Medical School in Sokoto, Nigeria, an anatomical variation was observed in a male Yankasa sheep approximately 1.5 years old. On identifying the anomaly, the skull was isolated and further examined.

The bones of the skull did not show any gross abnormality while the sutures and foramina were all in an anatomically normal spatial orientation. The two unique processes were attached to the external occipital protuberance. The length and width of the processes were measured using a digital Vernier caliper (Metr-ISO®), the left occipital process was longer (1.5cm) and wider (0.5cm) compared to the right which measured 0.5cm and 0.3cm respectively. The processes were osseous and hard on palpation. The radiograph of the skull was taken using a portable x-ray machine (PLH Medical Ltd, Watford Herts, U.K.). A radiographic factor of 14mAs and 60KVp was used; the skull was allowed to rest on the radiographic film cassette containing an X-ray film. A ventrodorsal position was adopted as described by Douglas *et al*. (1987). On radiographic evaluation, the processes were radiolucent in the X-ray film (Figure 1 -3).

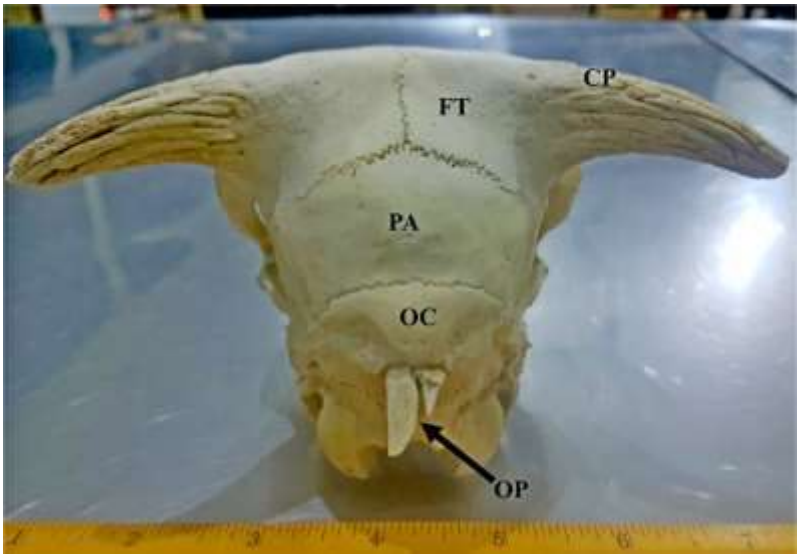

Figure 1: A nuchal view of the skull of the male Yankasa breed showing two occipital processes (OP), occipital bone (OC), parietal bone (PA), frontal bone (FT), and cornual process (CP)

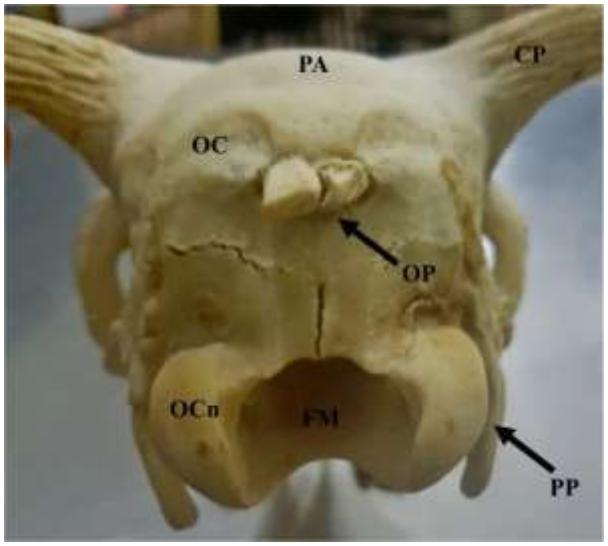

Figure 2: A caudal view of the skull of the male Yankasa breed showing two occipital processes (OP), occipital bone (OC), occipital condyles (OCn), parietal bone (PA), cornual process (CP), foramen magnum (FM), and paracondyloid process (PP)

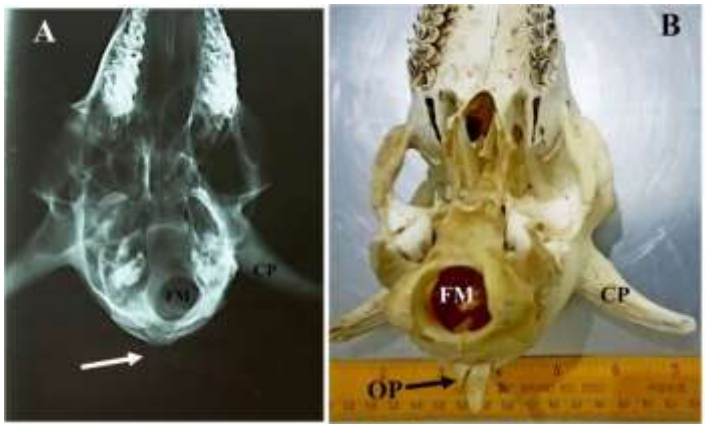

Figure 3: A ventral view of a radiograph (A) and gross (B)photographs of the skull of the male Yankasa breed showing a radiolucent occipital process (white arrow), two occipital processes (OP), foramen magnum (FM), and cornual process (CP)

DISCUSSION

The paired processes on the external occipital protuberance could serve as the attachment of the nuchal ligament since it has articulated on the attachment site of the ligament as reported in several works of literature (Dyce *et al*., 2017).

The radiolucency of bones has been described in radiography as ‘‘bone lucency’’ *(Loprestiet al*., 2020; Novelline, 1997).The dark/radiolucent appearance of the occipital processes illustrated in the X-ray result in this current case study technically signifies that the density of the processes differs from the bones of the skull, this further implies that the processes are demineralized and absorbs more X-rays than the other skull bones. According to Panuel *et al*. (1993), bone lucencies is a very rare condition and can be caused by a variety of factors, such as cysts, cancer, benign tumors, fractures, or infection. Although the study on the skull of the Yankasa breed is scanty, hence the incidence of variations in the skulls of Nigerian breeds of sheep may have been under-reported, to the best of our knowledge the occipital processes reported in the study is the first of its kind to be documented in the literature. The occurrence of these processes remains unique for anatomist and helpful for surgeons, as such more studies on the morphology of the Yankasa skull and other Nigerian breeds of sheep was recommended.

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