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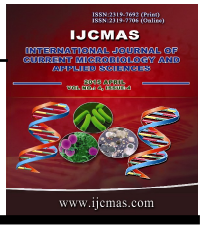


Original Research Article

Gross Anatomy of Os Coxae of Ostrich (*Struthio camellus*)

S. Tamilselvan*, K. Iniyah, S. Jayachitra, S. Sivagnanam, K. Balasundaram and C. Lavanya

Department of Veterinary Anatomy,
Veterinary College and Research Institute, Namakkal-637002, Tamil Nadu, India
**Corresponding author*

Keywords

Gross anatomy, Ostrich, Os coxae, Ilium, Ischium, Pubis

A B S T R A C T

The study was carried out on three adult ostrich birds to observe the gross anatomical features of os coxae. The os coxae of ostrich were massive bones, formed by opposition of three bones, namely ilium, ischium and pubis. The ilium was the largest, anterior most and dorsal bone placed in median plane and divided into preacetabular and postacetabular part. The preacetabular part fused with its fellow in the midline whereas postacetabular fused with lumbar and sacral vertebrae ventrally. The ischium and pubis were thin; rod shaped long bones placed ventrolaterally, which runs downward and backward. Unlike emu, the pubic bone forms pubic symphysis caudomedially. The acetabulum was more prominent and situated on the lateral surface of ilium. Between the ischium and pubis, cranially obturator foramen and caudally pubioischiatic foramen were present. The antitrochanter was more prominent.

Introduction

The ostrich is the largest living bird, reaching over 200 kg body weight and 2.7 m in height. It is classified under Ratites, which are large, ground dwelling, flightless birds such as rhea, emu, cassowary and kiwi (Brett and Hopkins, 1991). Ostrich have been a bird of aesthetic interest since ancient times. Apart from being hunted for their flesh and plumes, they were kept in captivity, tamed and domesticated by the early Egyptians, Greeks and Romans (Predoi *et al*., 2008). It acquired the name *Struthio camellus* from the Latin word that meant camel because of the similarities they had with camels, such as their prominent eyes and eyelashes, their large size and their remarkable tolerance to the desert habitat (Predoi *et al*., 2008). Presently, ostrich farms are emerging as a profitable agricultural business (Phillip and Minnaar, 1992). The peculiar design of the os coxae helps in supporting the body during the rapid growth of ostrich in attaining huge adult size. In this paper we presented the gross anatomical peculiarities of os coxae in ostrich.

Materials and Methods

The os coxae were collected by natural maceration of three numbers of dead birds

after postmortem. Os coxae was cleaned out of any tissue debris using detergent solution and is degreased by treating in hot water, followed by surface cleaning with acetone (Tompsett, 1970). The cleaned bone is air dried thoroughly. Gross anatomy of the bone was carefully observed and recorded using a high precision camera. Many peculiar features were observed in the os coxae of ostrich as against the same bone of other avian species and the data was interpreted as functional anatomy.

Result and Discussion

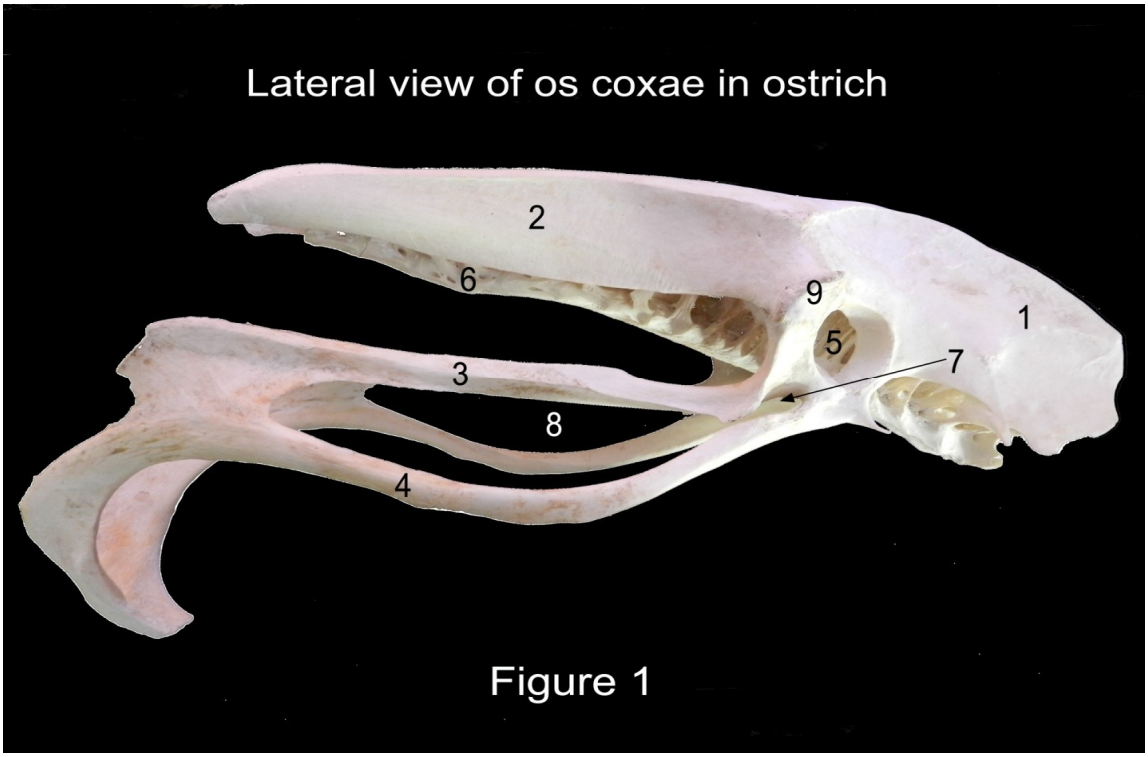
The os coxae of ostrich was massive bone, formed by opposition of three bones, namely ilium, ischium and pubis (Mc.Lelland, 1991). Huge size of the bone was related to the bipedal standing posture, gait and support. The ventrally open pelvis formed a dorsal roof like covering for a large part of the cavity providing structural protection for the abdominal viscera and the eggs in females (Marshall, 1961).

The ilium was large, broad, flat and dorsal bone approximately 60 cm long. It was compressed laterally and placed on either side, oriented downward and backward. The preacetabular wing of the ilium was quadrate shaped and the postacetabular wing was trapezoidal shaped (Fig. 1) whereas the pre acetabular part was in the form of rough quadrilateral plate and post acetabular part was in the form of elongated triangle in emu (Shanthi lakshmi, 2007). The preacetabular part was fused with its fellow along dorso-cranial midline (Fig. 3) to form a boat like structure which accommodates synsacrum. The post acetabular part was fused to the synsacrum (Fig. 3). The preacetabular part was approximately 25 cm long and it consisted of four borders and two surfaces. The dorsal border was thin and curved slightly upward and ventrally fused with spinous process of last two thoracic vertebrae and entire lumbar vertebrae. When compared with the observations of Venkatesan *et al*. (2008) in emu, the dorsal curvature of ilium in ostrich was less convex and ventral border of ilium was thin running downward forward and less outward and enclosed more space for bodies of vertebrae and was continued with acetabulum. The anterior border at the middle projected laterally forming a notch (Fig. 2) as in emu. The posterior border joined with post acetabular part and projected laterally to create a wider area for the attachment of sacral vertebrae. The joint between preacetabular and post acetabular part was well demarcated by a bony prominence on its lateral surface (Fig.1). The lateral surface was concave and presented ridges and a tubercle for the attachment of muscles. The medial surface was rough and attached with transverse processes of vertebrae (Nickel *et al.*, 1977).

The dorsal border of postacetabular part was thick and ventrally fused with spinous process of sacral vertebrae. The ventral border was thin and runs downward backward and less outward. The anterior border was continuous with its fellow. The posterior borders of right and left bones joined the synsacrum to form “V” shape (Fig. 2). The caudal extremity of ilium was tuberous and the antitrochanter was more obvious in accordance with the observation of Brett and Hopkins (1991).

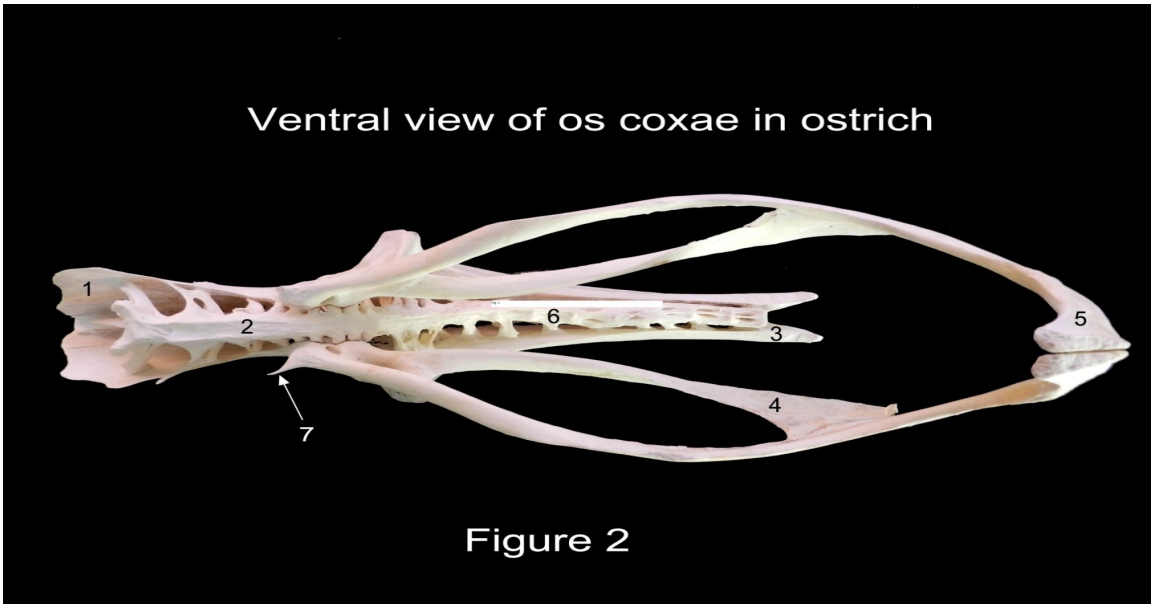
The ischium bone was long and narrow. The two ischia were divergent caudally. The flat caudal end of the ischium was slightly behind the caudal end of the ilium (Fig. 1). There was a communication between obturator foramen and pubio-ischiatic foramen (Fig. 1).

Fig.1 Lateral view of os coxae in ostrich



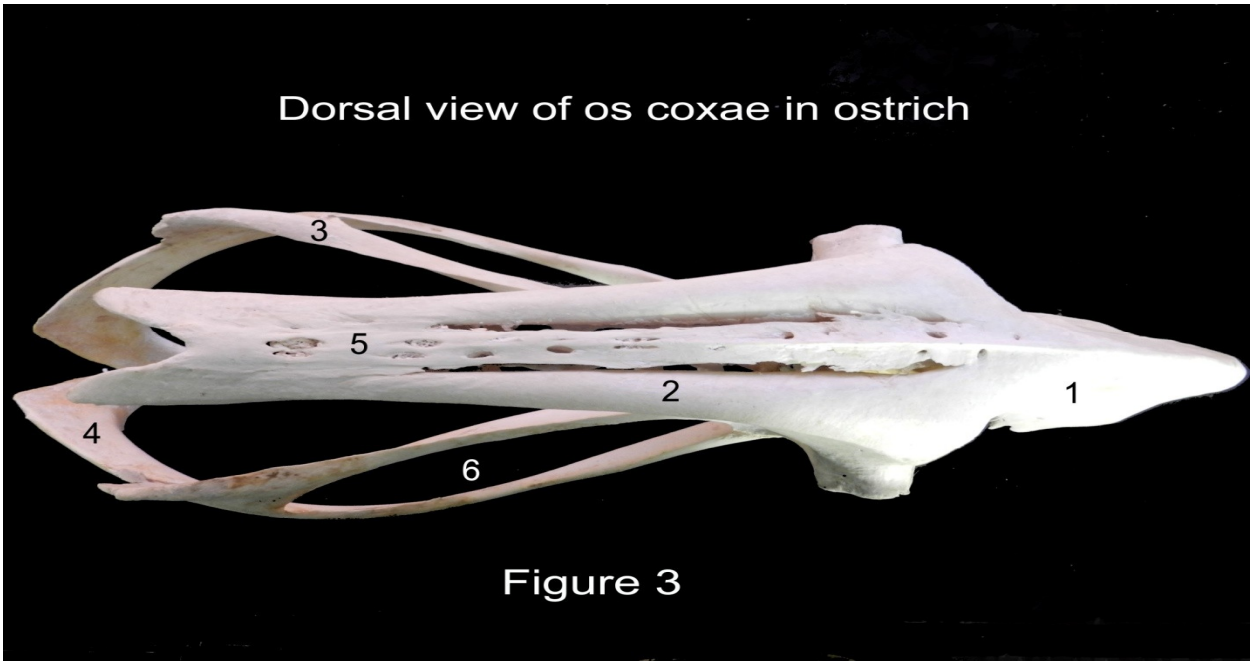
1- preacetabular ilium, 2- postacetabular ilium, 3-ischium, 4- pubis
5-acetabular foramen, 6- bodies of sacral vertebrae, 7-obturator foramen
8-pubioischiatic foramen, 9-antitrochanter

Fig.2 Ventral view of os coxae in ostrich



1- preacetabular part of ilium, 2- bodies of lumbar vertebrae
3- postacetabular part of ilium, 4-ischium, 5-pubis
6- bodies of sacral vertebrae, 7- Processus pectinealis

Fig.3 Dorsal view of os coxae in ostrich



1- preacetabular part of ilium, 2- postacetabular part of ilium
3-ischium, 4- pubis, 5- bodies of sacral vertebrae
6-pubioischiatic foramen

Pubis formed the ventral and caudal portion of the pelvic girdle. It was a long, slender bone, dorsally concave in front and convex behind. Pubis was situated ventro-lateral to the ischium (Fig.1). The cranial extremity of the pubis arises from the ventral border of the acetabulum, runs downward and backward. The caudal extremity extended beyond the ilium and ischium, slopes downward, inward joined with its fellow by a cartilage to form pubic symphysis (Fig. 2) medially, whereas no symphysis was found between opposite pelvic bones in emu (Fig. 4) (Shanthi lakshmi, 2007). The major function of pubic symphysis was to support the weight of abdomen. The caudal 1/3rd of pubis was fused dorsally with caudal extremity of ischium. The pubic bone cranially formed an obturator foramen and caudally more prominent ischiopubic foramen with the ischium. A well developed muscular process (processus pectinealis) was observed on the cranial extremity of pubis, below the acetabulum (Fig. 2). George and Berger (1996) noticed that the processus pectinealis served as the origin for pectineus muscle, whereas Sathyamoorthy *et al.*, (2012) noted the absence of processus pectinealis in Spot billed pelicans.

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