CASE REPORT

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Type B triorchidism in an adult indigenous fowl (*Gallus gallus domesticus*) in Sokoto, Nigeria- Case report

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Abstract
This paper presents a possible first case of triorchidism in an indigenous fowl in Sokoto, northwest Nigeria. Triorchidism is an exceptionally rare congenital abnormality which has been observed in other wild birds which could be ascribed to faulty embryological development with developmental cause that are distinct from testicular asymmetry. During a comparative investigation of the reproductive tract of cock (gallus gallus domesticus) drake (Anas platyrynchos) and guinea fowl (numida meleagris) in Sokoto and her environs, three testes were observed in a cock following abdominal laparatomy. The third testis which was smaller when compared with the right and left testes was attached to the proximal end of the right testes with which it shared the same epididymis. The right, left and third testes weighed 7.40, 7.20 and 2.10gm respectively while the length of the right, left and third testes were 3.60, 3.40 and 1.40cm respectively. When the three testes were cut open, similar whitish fluid oozed out. The causes and implications of this anomaly are suggested.

Keywords: Congenital, fowl, sokoto, testis, triorchidism.

Introduction
Triorchidism is a condition ascribed to the incidence of having three testes. The true pathology is poorly known due to rarity of cases and is dependent on the underlying developmental cause (Leung, 1988). Instances of triorchidism have been reported in domestic chickens (Shrivastava *et al*.1988; Hocking, 1992) and in a captive-bred line of Japanese Quail (*Coturnix japonica*) (McFarland, 1965). Spranger *et al*., (2002) and Savas *et al*., (2009) reported that triorchidism is thought to comprise of a congenital developmental abnormality associated with normal histology and functional spermatogenesis in the third testis in more than half of human cases. It is different from testicular asymmetry, which is widespread in birds and has been found to correlate with age and secondary sexual characteristics (Moller, 1994). The phylogenetic distribution of triorchidism in vertebrates is poorly known due to dearth of information. A case of type B triorchidism in an indigenous breed of fowl is hereby reported.

Case report
During a research work to collect comparative data on the reproductive tract of cock (Gallus gallus domesticus), drake (Anas platyrynchos) and guinea fowl (Numida meleagris) from Sokoto Metropolis and her environs, a cock was observed to have three testes. It was observed that the third testis was smaller than the right and left testes and was attached to the proximal end of the right testis and shared the epididymis with the later. The weight and length of both the right and left and the third testes were determined using Metler's Analytical balance (PM16-K) and metre rule respectively. The right and left testes weighed 7.40 and 7.20gm respectively while the third testis weighed 2.10gm. The length of the right and left testes were 3.60 and 3.40cm respectively while that of the third testis was 1.40cm. When the third testis was cut open, a milky whitish fluid containing spermatozoa oozed out (King & Mclelland, 1975) similar to the fluid observed when the right and left testes were cut open. The right and left testes were bean-shaped. The third testis was not bean-shaped but was slightly elongated. The three testes were nearly indistinguishable in color and firmness (Plates I & II).
The testicular tissues were then fixed in 10% formalin. Thereafter, routine method (Junqueira & Carneiro, 2003) was used to prepare the tissues for histological evaluation under a light microscope.
Plate III, IV & V shows profiles of seminiferous tubules of right, left and third testes respectively.

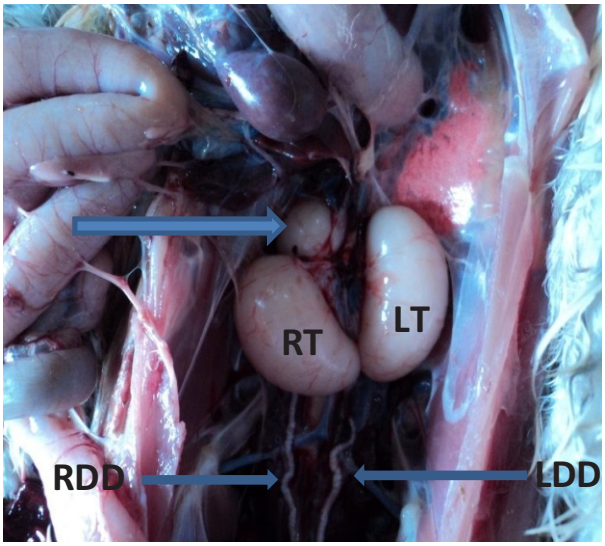

Plate I: Photograph of the testes of cock in-situ. The big arrow points to the third testis. RT = Right testis, LT = Left testis, RDD = Right ductus deferens, LDD = Left ductus deferens, I = Intestine.

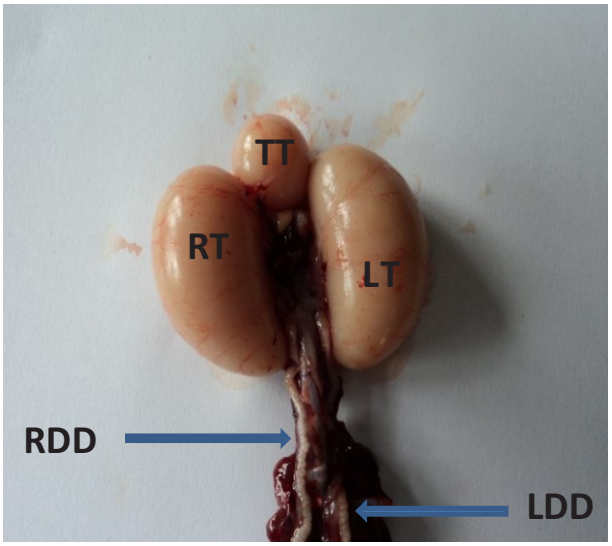

Plate II: Photograph of the three testes removed from the cock. TT = Third testis, RT = Right testis, LT = Left testis, RDD = Right ductus deferens, LDD = Left ductus deferens

Plate III: Photomicrograph of profiles of seminiferous tubules of the right testis showing active epithelium. SE = Seminiferous epithelium and an arrow showting connective tissue septa.

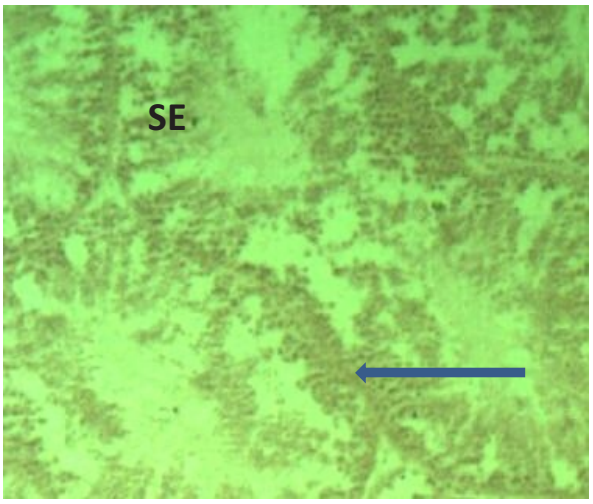

Plate IV: Photomicrograph of profiles of seminiferous tubules of the left testis showing active epithelium. SE = Seminiferous epithelium and an arrow showing connective tissue septa.

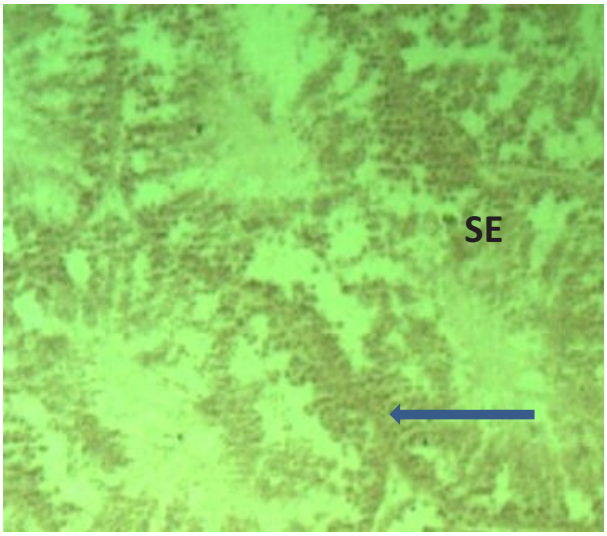

Plate V: Photomicrograph of profiles of seminiferous tubules of the third testis showing active epithelium. SE = Seminiferous epithelium and an arrow showing connective tissue septa.

Discussion

To the best of my knowledge, this is the first reported case of triorchidism in domestic chicken in this part of the country. In this report, the third testis was firm in consistency, had normal cream color and active seminiferous epithelium as the normal right and left testes. Triorchidism in birds was first reported by McFarland (1965), who examined 2,000 male Japanese Quail and found one case of triorchidism that was associated with absence of the right kidney. In that case, the right testis was divided into two nearly co-equal sections, both of which were undergoing normal spermatogenesis. Katiyar *et al*., (1986) first reported a supernumerary right testis in a domestic chicken while Shrivastava *et al*., (1988) reported same in the left testis of domestic chicken. The authors also reported that the small round supernumerary testis was softer in consistency, and normal in color and spermatogenic activity by histological examination. Hocking (1992) systematically examined the testes of 378 male domestic chickens and found three cases of triorchidism, each of which was comprised of two left testes. This is contrary to the observation in this report in which there was an occurrence of third testis. This indicates that both right and left testis could be affected by the phenomenon.

The possible aetiology in this case was not investigated. However, Hocking (1992) suggested that supernumerary testes probably originate by congenital defect and are fairly common in domestic fowl, as indicated by his finding which showed third testes in 0.8% of males. Supernumerary testes originating by congenital defect is thought to be present throughout life as indicated by their presence in adult birds. This phenomenon is different from asymmetrical testes which are influenced by age, season and other unidentified factors (Graves, 2004). The need to understand the mechanisms or risk factors associated with this is imperative.

By classification of Leung (1988), this case is that of type B where supernumerary testes drain into the epididymis of the normal right testis. According to this classification, Type B triorchidism is being reported. However, research is recommended in this rare area to find out whether the conditions affect avian reproductive potential.

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