Clinicopathologic characterization of diseases diagnosed in cockatiels (*Nymphicus hollandicus*) in the Sertão da Paraíba

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ABSTRACT

The clinical and pathological aspects of diseases diagnosed in cockatiels (*Nymphicus hollandicus*) in the Sertão da Paraíba, Northeast Brazil, are described. From January 2003 to December 2023, 362 birds were necropsied at the Animal Pathology Laboratory of the Federal University of Campina Grande. Of these, 9 (2.48%) cases were cockatiels, where six were females and three were males, most of the animals were adults and came from the municipality of Patos, Paraíba. The diseases diagnosed were: cloacal prolapse (09/02); dystocia-egg retention (01/09); complete fracture of tibiotarsal bone and fibula (01/09); perforating ulcer and cellomite (01/09); sepsis associated with scabies (09/01); squamous cell carcinoma (01/09); liver cirrhosis (01/09); and osteopathy due to calcium deficiency (01/09). Changes in the cloaca and oviduct were the most frequent conditions, with the others being seen occasionally. Although they involve different causes, most of the diseases observed are directly or indirectly related to sanitary and nutritional management practices. Highlighting the importance of knowledge about the possible diseases that can affect this species, whether it is raised freely or domiciled.

Keywords: Bird diseases, Cockatiels, Management errors, Psittaciformes.

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INTRODUCTION

Psittacines are birds admired for their ability to interact socially and the variety of sounds they are able to emit. Cockatiels (*Nymphicus hollandicus*) are one of the most popular Psittaciformes species as pets in the world (Zavatta *et al*., 2024). When raised in captivity or as companion animals, cockatiels often have their habitat and diet modified inappropriately, which can trigger several health problems related to feeding and recurrent management errors (Assis *et al*., 2018). Commonly, the stress caused by inadequate handling can predispose birds to the development of immunosuppression and greater susceptibility to a variety of infectious and non-infectious diseases (Rocha *et al*., 2014). Other factors such as chemical irritants and the incidence of solar radiation may also be associated with the emergence of diseases, including neoplastic diseases (Filgueira; Reis, 2009). Thus, the objective of this work is to describe the diseases diagnosed in cockatiels in the Sertão of Paraíba, considering their main clinical and pathological aspects.

MATERIAL AND METHODS

A retrospective study of necropsy cases in birds was carried out at the Animal Pathology Laboratory of the Federal University of Campina Grande, Patos, Paraíba, northeastern Brazil, from January 2003 to December 2023, with the purpose of identifying diseases in cockatiels. The clinical and necropsy protocols were reviewed, and information related to epidemiological data (species, sex, age and origin) was later collected. Photographic records were also retrieved to complement the macroscopic descriptions of the lesions. To describe the microscopic lesions, the histopathological slides were reviewed and, when necessary, new slides were made from the material archived in paraffin blocks, and stained with Hematoxylin and Eosin (HE).

RESULTS

During the study period, 362 birds were necropsied, 9 (2.48%) of which were identified as cockatiels *(Nymphicus hollandicus).* The diseases diagnosed included: cloacal prolapse (02/09); dystocia-egg retention (01/09); complete fracture of tibiotarsal bone and fibula (01/09); perforating ulcer and cellomite (01/09); sepsis associated with scabies (09/01); squamous cell carcinoma (01/09); liver cirrhosis (01/09); and osteopathy due to calcium deficiency (01/09).

CLOACA PROLAPSE

Two animals were diagnosed with cloacal prolapse (cockatiels 1 and 2), both females, adults, with lean and regular body score, respectively. Cockatiel 1 presented cloacal prolapse with no apparent cause and was referred for a clinical procedure to reduce the prolapse, but presented cardiorespiratory arrest and was referred for anatomopathological evaluation. At necropsy, prolapse

of the final segment of the cloacal was observed, with a reddish-black area covered by crust. Cockatiel 2 presented apathy, greener feces and partial egg retention in the cloaca. The owner tried to assist in the expulsion of the egg, but the procedure ended up culminating in the prolapse of the cloaca. The animal was taken to the veterinarian and sent for surgery to correct the prolapse, but decompensated and died post-surgery. At necropsy, cloacal prolapse with red-blackish edges and a healthy surgical wound measuring approximately 1 cm in diameter were observed (Fig. 1 A). An area of blackish red dilation was also observed in the oviduct region.

EGG RETENTION DYSISTOCIA

An adult female cockatiel from the municipality of Patos, Paraíba, with an increase in volume in the cloacal region, was diagnosed with egg retention. The veterinarian in charge performed a maneuver by pressing the region, observing excretion of caseonecrotic and lumpy exudate. The animal died after 24 hours. At necropsy, several immature eggs were observed in the oviduct. The cloaca was dilated, with diffusely reddish mucosa and a marked amount of caseonecrotic and lumpy exudate (Fig. 1 B).

ÚLCERA PERFURANTE AND COELOMITE

A four-year-old male cockatiel from the municipality of Barro, Ceará, presented apathy and anorexia, evolving to death in approximately five hours. The animal was raised indoors with free access to a cage and fed with fruits and specific commercial feed. At necropsy, an area of transmural ulceration was observed, measuring approximately 0.3 cm in diameter, and surrounded by a reddish halo in the isthmus region. At the opening of the segment, mucosa with a moderate amount of viscous and blackish-red material (digested blood) was observed. Contamination of the coelomatic cavity by contents of the digestive tract was also observed (Fig. 1 C).

TRAUMA

A six-year-old female cockatiel from the city of Patos, Paraíba, was admitted with a history of having been attacked by other birds inside the cage. The animal died and was sent for necropsy. On external examination of the cadaver, a complete fracture of the tibia, fibula and left tarsus was observed, associated with a focally extensive reddish area (hematoma) (Fig. 1 D).

SARNA AND SEPSE

A two-year-old female cockatiel from the municipality of Patos, Paraíba, raised with other contacts in a cage, and fed on seeds, presented a history of apathy, anorexia and scabies for approximately two months, and treatment with Ivermectin and Dolemil was carried out. On external

examination of the cadaver, a thin body state, diffuse desquamation of the pelvic limbs was observed. At the opening of the coelomatic cavity, diffusely reddish air sacs, lungs and kidneys were observed. The liver was diffusely red-black, and some muscle fibers were darker in color. Microscopically, bacterial myriads were observed in the blood vessels and liver, as well as diffuse congestion and leukocytostasis.

SQUAMOUS CELL CARCINOMA

A 15-year-old male cockatiel from the municipality of Patos, Paraíba, presented apathy, diarrhea and irregular mass in the left pelvic limb, which evolved to amputation. The animal died and was sent for necropsy. On external examination of the cadaver, a cachectic body state, absence of feathers in the ventral region, and a multinodular, irregular, yellowish mass with blackish punfiform multifocal areas on the right foot were observed. Microscopically, a densely cellular, poorly delimited and expansive neoformation was observed, composed of malignant epithelial cells assuming arrangements in cords and nests, often with areas of central keratinization (corneal pearls), and supported by moderate fibrovascular stroma. Polygonal neoplastic cells with well-defined, eosinophilic cytoplasm ranging from sparse to moderate. Nuclei ranging from round to oval with scant chromatin and sometimes multiple nucleoli evident. Moderate pleomorphism, characterized by anisocytosis and anisocariosis. Not very evident mitoses (0 to 2 per field of highest magnification [400x]). Areas of intratumoral multifocal necrosis permeated by inflammatory infiltrate of heterolyphs and rare macrophages and carcinomatous infiltration of adjacent bone tissue were also observed. Microscopic features compatible with well-differentiated squamous cell carcinoma.

HEPATIC CYRRRHOSIS

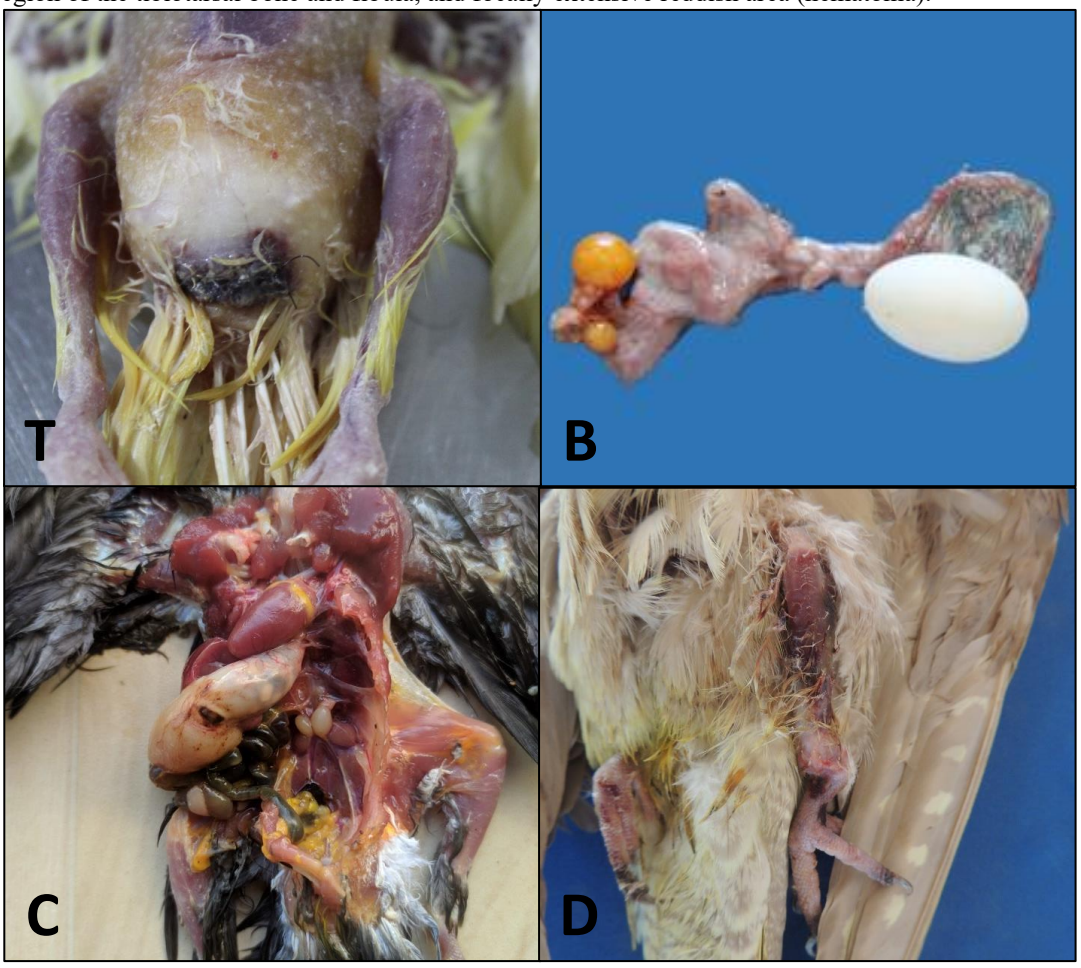
A 17-year-old male cockatiel from the city of Paracuru, Ceará, presented apathy and nausea for three days. Soon after, he appeared dead. Previously, the animal had a respiratory infection that culminated in eye impairment, and loss of vision. It fed on a mixture of seeds (oats, sunflower seeds and birdseed) stored improperly, as well as bread, green corn and cabbage. At necropsy, a small volume of translucent fluid was observed in the opening of the coelomatic cavity. The liver was markedly reduced in size, with a slightly greenish capsular surface, diffusely irregular, with well-defined multifocal nodules measuring approximately 0.1 cm in diameter, which deepened to the parenchyma. Microscopically, it was observed that approximately 70% of the hepatic parenchyma was replaced by extensive trabeculae of mature and immature connective tissue, sometimes associated with a discrete and multifocal inflammatory infiltrate composed of lymphocytes, plasma cells and macrophages, surrounding well-defined islands of hepatocytes (regeneration nodules). Hepatocytes frequently showed macro and microvacuolar degeneration of the cytoplasm, and in

some sections there were focally extensive areas of coagulation necrosis, characterized by pycnosis, karyorexia or nuclear absence, hypereosinophilia or even cytoplasmic rupture.

OSTEOPATHY DUE TO CALCIUM DEFICIENCY

A three-month-old female cockatiel from the municipality of Patos, Paraíba, was diagnosed with osteopathy due to calcium deficiency. The animal had arching of the pelvic limbs and fingers, compatible with calcium deficiency. Microscopically, diffuse replacement of bone tissue from both femurs by fibrous tissue was observed.

Figure 1: Diseases diagnosed in cockatiels (*Nymphicus hollandicus*) in the Sertão of Paraíba. (A) Cloaca prolapse. Surgical wound area with blackened edges. (B) Dystocia-egg retention. Egg in the final portion of the oviduct. (C) Perforating ulcer and cellomite. Presence of ulcer, digested blood and viscous material. (D) Trauma. Complete fracture in the distal region of the tibiotarsal bone and fibula, and focally extensive reddish area (hematoma).



Source: LPA-FOCG.

DISCUSSION

In the present study, most of the necropsied animals came from the municipality of Patos, Paraíba, where the laboratory where the research was carried out is located. Most of the animals were female, but this fact was not relevant because most of the diseases were not recurred, and it was not possible to compare the sexes. The most frequent disease was cloacal prolapse, which together with

dystocia – egg retention, may be related to nutritional deficiencies such as imbalance in calcium levels, nutritional status, high photoperiod, sexual stimulation by another bird and even egg malformations (Pollock; Orosz 2002; Zavatta *et al*., 2024). The other diseases had only one case each. Other diagnosed diseases, such as liver cirrhosis and osteopathy due to calcium deficiency, may also be related to nutritional factors, since the diet of these animals is mostly restrictive to commercial rations that do not always meet physiological needs, or in the case of the patient with cirrhosis, who had an inappropriately high-fat diet, overloading the metabolic functions of the liver, which over the years may have contributed to the development of the disease (Assis *et al*., 2018; Toyama et al., 2022). Regarding the case of trauma, as described in the literature, traumatic accidents in birds are common, whether resulting from collision, being run over, or predation (Andrade *et al*., 2024). It is possible that the fact that the animal lives in a cage with other animals and has a thin body state may indicate conditions of inadequate handling, increasing stress levels, with consequent changes in behavior and aggressiveness. Regarding the case of sepsis and scabies, it is important to highlight that as described in the literature by Rocha *et al*. (2014), the handling condition of birds directly influences the immunity of these animals, predisposing to the proliferation of opportunistic agents such as bacteria and fungi, developing diseases and potentially leading to death. With regard to the case of squamous cell carcinoma, although it commonly occurs in other species such as felines, canines, cattle, and horses, it has also been described in birds (Zamboni *et al*., 2020). The changes observed microscopically are compatible with those described in the literature (Souto *et al*., 2021).

CONCLUSION

Despite the low number of diagnosed cases, it is important to highlight the variety of diseases observed, reinforcing their relevance in the poultry medical clinic. This lower number of cases can also be attributed to underreporting of cases. Another important factor observed was that most of the diseases diagnosed are directly or indirectly related to management errors, either in the environment in which the animal lives or in relation to the diet offered. Thus, the importance of knowing about the proper management of this species is highlighted, as well as about the diseases that they can develop throughout life.

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REFERENCES

1. Andrade, J. P., Santos, T. P., Lima, M. T. B., Soares, C. F., Carvalho, M. P. N., & Corteze, A. A. (2024). Amputação de asa esquerda em calopsita (*Nymphicus hollandicus*) vítima de predação por gato doméstico. *Medicina Veterinária, 18*(2), Recife.

2. Assis, V. D. L., Carvalho, T. S. G., Saad, C. E. P., Miyagi, E. S., & Gionbelli, M. P. (2018). Avaliação de dietas na produção de calopsitas e parâmetros reprodutivos. *Arquivo Brasileiro de Medicina Veterinária e Zootecnia, 70*(3), 830-836.

3. Filgueira, K. D., & Reis, P. F. C. C. (2009). Relato de caso – Carcinoma dérmico de células escamosas em galo (*Gallus gallus domesticus*) geriátrico. *Ciência Animal Brasileira, 10*(3), 997-1001.

4. Pollock, C. G., & Orosz, S. E. (2002). Avian reproductive anatomy, physiology and endocrinology. *Veterinary Clinics: Exotic Animal Practice, 5*(3), 441-474.

5. Rocha, T. M., Andrade, M. A., Santana, E. S., Fayad, A. R., & Matias, T. D. (2014). Aspectos clínicos, patológicos e epidemiológicos de doenças imunossupressoras em aves. *Enciclopédia Biosfera, 10*(18), 355-379. Goiania-GO.

6. Souto, E. P. F., Oliveira, A. M., Cardoso, D. F., Oliveira, F. N. L., Galiza, G. J. N., & Dantas, A. F. M. (2021). Squamous cell carcinoma in the foot of a cockatiel (*Nymphicus hollandicus*) from Northeastern Brazil. *International Journal of Development Research, 11*(2), 44663-44665.

7. Toyama, V. N. Y., Barros, M. A., Queiroz, A. B. P. S., & Nascimento, D. C. (2022). Lipidose hepática em papagaio-verdadeiro (*Amazona aestiva*) adultos: Revisão. *PUBVET, 16*(05), 1-16.

8. Zamboni, R., Scheid, H. V., Hugen, G., Lobo, R. R., Marcolongo-Pereira, C., Vargas, G. D., & Sallis, E. S. V. (2020). Carcinoma de células escamosas esofágico em uma galinha doméstica. *Science and Animal Health, 8*(1), 88-93.

9. Zavatta, T. L. G., Zabicki, V. M., Coelho, B. T., Padula, M. R., & Cisi, V. L. F. (2024). Distocia em calopsita (*Nymphicus hollandicus*) – relato de caso. *Revista FT, 28*(Ed. 134), maio.