CHOLOANGIOCARCINOMA IN COCKATIELS (NYMPHICUS HOLLANDICUS)

MICHAŁ GESEK, TOMASZ STENZEL¹, JÓZEF SZAREK, IZABELLA BABIŃSKA, AND TOMASZ MIESZCZYŃSKI

Chair of Pathophysiology, Forensic Veterinary Medicine and Administration, ¹Department of Birds’ Diseases, Faculty of Veterinary Medicine, University of Warmia and Mazury, 10-719 Olsztyn, Poland
michal.gesek@uwm.edu.pl

Received for publication June 23, 2009

Abstract

Cholangiocarcinoma has been diagnosed in a 9-year-old cockatiel (Nymphicus hollandicus). Nodules, 1 to 5 mm in diameter, white to brown-red in colour, were visible all over the surface of the liver. A microscopic examination revealed the presence of acinar cells resembling biliary epithelium, with numerous mitotic figures and “lakes” of mucin among them. Neoplastic changes were accompanied by necrosis of the liver tissue and inflammatory infiltrations. This case of cholangiocarcinoma is the first one recorded in a cockatoo parrot.

Key words: cockatiel, cholangiocarcinoma, liver, kidneys, lung, pathomorphology.

Cholangiocarcinoma (intrahepatic bile duct carcinoma) is a malignant neoplasm comprising epithelium resembling the biliary tract. The neoplasm may have the form of an individual or multiple nodules. It may be a well, moderately, or poorly differentiated tumour, depending on the spatial arrangement of the neoplastic cells.

It has been diagnosed in various animal species, but is relatively rare in birds. Cholangiocarcinoma has been diagnosed in various wild animals; e.g., in an adelie penguin (Pygoscelis adeliae) (18), a cynomolgus monkey (Macaca fascicularis) (17), a capuchin monkey (Cebus albifrons) (3), in a ring-tailed lemur (Lemur catta) (4), in a margay (Felis wiedii) (15), a blue shark (Prionace glaca L.) (2), and in a Turkish Van Cat (10). It also occurs in domestic animals, such as cats (11), goats (19), horses (6), geese (13), ducks (14) and – combined with hepatocellular carcinoma – in dogs (20) and mares (12). Cases of the tumour have also been described in wild birds, for example, in the Florida sandhill crane (1), in the Red-tailed Hawk (Buteo jamaicensis) (9), in the Chilean flamingo (Phoenicopterus ruber chilensis) (21), in the Yellow-faced Amazon Parrot (Amazona xanthops) (16), and in the Peach-fronted Conure (Aratinga aurea) (8).

The Peach-fronted Conure and the Amazon Parrot are included in the order Psittaciformes and the family Psittacidae. However, the available literature has not reported any case of cholangiocarcinoma in Cacatuidae, and specifically in the cockatiel (Nymphicus hollandicus). The cockatiel is a parrot reaching 28-32 cm in length, with a body mass of about 90 g, inhabiting Australia. It is very frequently kept as a pet.

Description of the case and Discussion

The owner of a 9-year-old cockatiel (Nymphicus hollandicus) reported that the bird was having difficulty breathing. A clinical examination revealed dyspnoea, loss of body mass, a swelling of the abdomen and weakening of the muscles. Chlamydiophilosis was suspected. The examination mentioned above, which is always accompanied by stress in wild birds, resulted in the parrot’s death. An autopsy was performed, and samples of the liver, kidneys, and lungs were taken for microscopic examination. They were fixed in 10% neutral formalin and embedded in paraffin blocks. The paraffin sections were stained with haematoxylin and eosin (HE).

Fig. 1. The parrot’s (Nymphicus hollandicus) liver with nodular lesions.
Fig. 2. Cholangiocarcinoma – regular formation of small neoplasm acini (long arrows) with “lakes” of mucin (short arrows), necrosis foci (N), hyperaemia (asterisks) with extravasation, and hyperplasia of connective tissue (CT). HE, 250x.

Figs 3a, b. Cholangiocarcinoma – regular formation of small neoplasm acini (long arrows), a “lake” of mucin (short arrows), necrosis foci (N), mitotic figures visible in few hepatocyte nuclei (in the circles), and infiltration of lymphoid cells (wide arrows). HE, a - 250x, b - 500x.

Fig. 4. Parenchymatous degeneration and necrosis of the renal tubule cells and glomerulonephritis. HE, 250x.

Figs 5a, b. Oedema, hyperaemia, and extravasation of the lung. HE, a – 250x, b – 500x.
The autopsy revealed a number of scattered and multiple nodules (Fig. 1). Their size varied and ranged from 1 to 5 mm. The nodules were firm, and yellow to brown in colour. No macroscopic lesions were observed in the lungs or kidneys.

The microscopic examination revealed that most of the liver had turned into neoplastic tissue, and that the organ itself was preserved only in small fragments. The neoplastic infiltrations had the form of cuboidal to columnar cells, arranged in an acinar pattern (Figs 2, 3), resembling biliary epithelium. Mucus was sometimes visible inside the ductules, but bile was not present. In addition, the changed tissue contained numerous hyperaemias, extravasations (Fig. 2), and lymphoid infiltrations (Fig. 3a). Parenchymatous degeneration of the hepatocytes and the focal necrosis of the cells were found, as well as topical proliferation of the connective tissue (Fig. 2).

The following lesions were observed in the kidneys: hyperaemia, haemorrhages, focal parenchymatous degeneration, and necrosis of renal tubule cells, as well as glomerulonephritis (Fig. 4). Hyperaemia, haemostasis, extravasations, oedema, and haemosiderosis were observed in the lungs (Fig. 5). No neoplastic metastases to the kidneys or lungs were found.

The analysis of the results of the macroscopic and microscopic examinations of the parrot’s liver allowed diagnosing well-differentiated cholangiocarcinoma. This tumour is the first reported in a cockatiel, although neoplasm in the  

The nuclei of the neoplastic cells differed in size and were round or oval, with reticular chromatin (Figs 2, 3) and frequently visible mitotic figures (Fig. 3b). Cytoplasm in the cells was light-coloured and eosinophilic. In the neoplastic liver, there were numerous hyperaemias, extravasations (Fig. 2), and lymphoid infiltrations (Fig. 3a). Parenchymatous degeneration of the hepatocytes and the focal necrosis of the cells were found, as well as topical proliferation of the connective tissue (Fig. 2).

The causes of cholangiocarcinoma include poisoning with aflatoxin and some other chemicals, Trematoda infection, hormonal disorders, as well as the presence of the hepatitis B virus in the body (5). According to a commonly held view, damage in the biliary ducts and their clogging contributes to the development of the neoplasm, which comprises the biliary epithelium. The aetiology and pathogenesis of the neoplasm also includes chronic inflammations and – resulting from this – large amounts of cytokines, which infiltrate the surroundings of the biliary ducts. Cytokines are thought to be responsible for the neoplastic transformation (7).

Due to the fact that parrots kept as pets usually feed on mixtures of different seeds, as well as non-harmful fruit, vegetables, and occasional insects, contamination of the seeds with aflatoxins may be the main cause of cholangiocarcinoma.

The paper was presented at the 26th Meeting of the European Society of Veterinary Pathology in Dubrovnik, 2008.

Acknowledgments: The authors wish to express their gratitude to Ms Krystyna Dublan, Msc, for making the microscopic preparations, and Mr Aleksander Penkowski, Msc, for his help in preparing the photographic dossier.

References

