

PATHOLOGICAL FINDINGS IN A GOLDEN SHOULDERED PARROT INFECTED WITH A NEW FILAROID SPECIES

Stacey Gelis
Animal Referral Hospital
250 Parramatta Rd
Homebush NSW

Andrew Peters
School of Animal and Veterinary Sciences
Charles Sturt University
Boorooma Street
Wagga Wagga NSW, 2678

Shane R Raidal
Veterinary Diagnostic Laboratory
School of Animal and Veterinary Sciences
Charles Sturt University
Boorooma Street
Wagga Wagga NSW, 2650

CASE REPORT

This case report describes the pathology associated with *Pelecitus bartneri* infection in a captive golden shouldered parrot (*Psephotus chrysopterygius*) that died from avian polyomavirus infection. It was presented for necropsy examination after it was found dead in its aviary. This report also demonstrates the value in submitting entire birds for complete pathological examination rather than selecting small random pieces into formalin in the hope that something might be found by the pathologist.

Gross necropsy revealed mild splenomegaly, hepatomegaly and a slightly swollen and reddish discoloured pancreas. The entire bird was fixed in formalin and submitted for histopathological examination. Haematoxylin and eosin-stained sections of kidney, liver, spleen, pancreas, stomach, lung and heart demonstrated widespread degranulation of exocrine pancreatic cells within the pancreas along with scattered necrosis, karyomegaly and basophilic intranuclear inclusions consistent with avian polyomavirus infection. Similar viral inclusions were present in the liver associated with necrosis of hepatocytes and also within enterocytes lining the cloaca. In the spleen there was widespread lymphoid depletion with scattered necrosis of lymphocytes. In the lung and heart there were massive numbers of microfilaria present within pulmonary vessels and the lumens of the atria and ventricles. Occasional individual microfilaria were within other small and large vessels in other organs such as hepatic sinusoids.

Consequently the formalin-fixed carcass was dissected carefully for evidence of adult nematodes which were found in the subcutaneous tissue surrounding both tibiotarsotarsometatarsal joints (Figure 1). Extensive examination of the subcutaneous tissues, fascial planes and airsacs failed to

detect any other adult nematodes.

The nematodes were post-fixed in alcohol and cleared with lactophenol then forwarded to Dr David Spratt at the Wildlife Parasite and Pathology Collection, CSIRO Ecosystem Sciences, Canberra who identified them as a new species named *Pelecitus bartneri* (Spratt, 2010) to honour the research of Cheryl Bartlett and Ellis Greiner (Bartlett and Greiner, 1986a; Bartlett and Greiner, 1986b).

Unlike the situation in marsupials (Spratt and Varughese, 1975; Mackerras, 1962; Reppas et al., 1995) the detection of circulating microfilaria in Australian birds is relatively uncommon (Bennett et al., 1977), and the detection of adult filaroids is even rarer, mainly because adults reside within subcutaneous tissues, fascial planes or peritracheal locations (Pizarro et al., 1994; Rutherford and Black, 1974; Guildal and Settnes, 1968). Adults are rarely associated with any inflammatory reaction (Figure 2) to draw the attention of clinicians and pathologist (Clark et al., 2009). The only other confirmed evidence of the genus *Pelecitus* from birds in Australia was the detection of *Pelecitus fulicaeatrae* (Diesing, 1861) from a Eurasian coot (*Fulica atra*) (Mawson et al., 1986). Although little is known about the temporal aspects of avian filaroid life stages it is likely that their microfilaria (Figure 3) survive for a much longer time within the blood than do adults within subcutaneous sites (Mawson et al., 1986; Spratt and Varughese, 1975; Spratt, 2010). Whilst tabanid flies and mosquitoes are the most likely vectors of spread none of the host:parasite ecologies of any avian filaroid has been characterised in any detail (Pizarro et al., 1994; Bartlett and Greiner, 1986a; Dissanaik and Fernando, 1974) and it is interesting that psittacine birds are well represented as hosts of *Pelecitus* and other filaroids in South American birds (Bartlett and Greiner, 1986b; Allen et al., 1984; Greve et al., 1982), but seemingly not so in Australia (Reppas et al., 1995). It is likely that this group of nematodes is not host specific and there is evidence that marsupials may well have replaced birds as the major ecological niche in Australia (Bartlett and Greiner, 1986b).

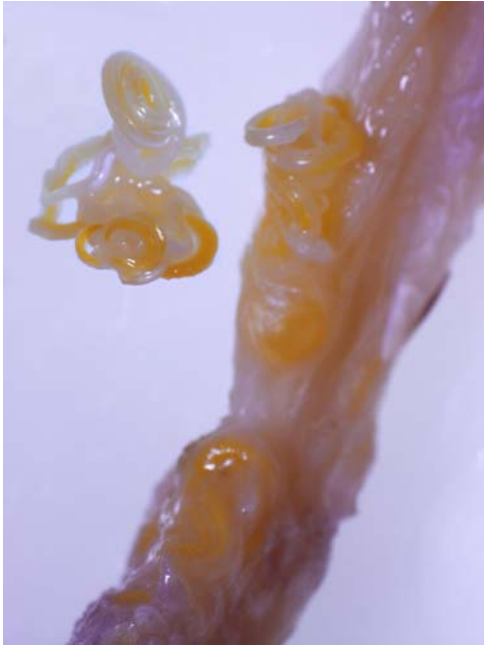


Figure 1. Tibiotarsometatarsal joint with skin removed demonstrating coiled *Pelecitus bartneri* located within subcutaneous tissue.

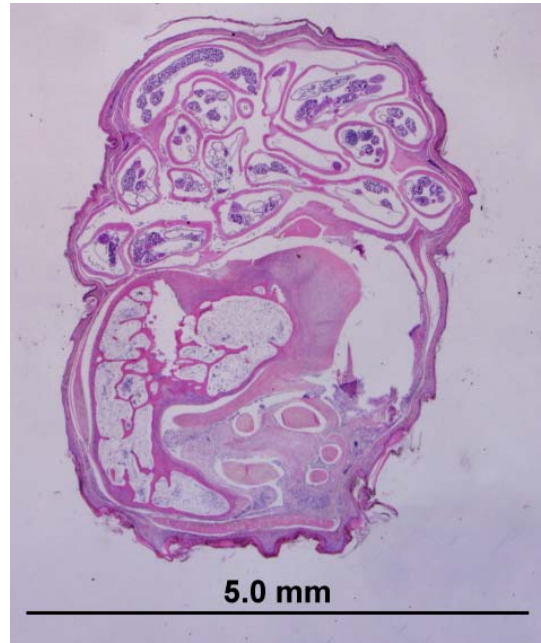


Figure 2. H&E section of tibiotarsus demonstrating numerous cross-sections of *Pelecitus bartneri* within subcutaneous tissue and an absence of inflammatory reaction.

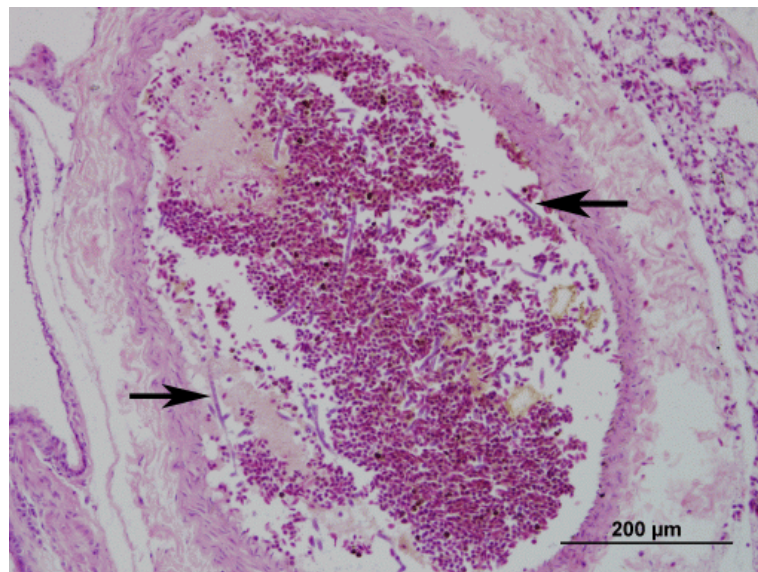


Figure 3. H&E section of pulmonary artery demonstrating abundant microfilaria present within the lumen (arrows).

REFERENCES

- Allen, JL, Kollias, GV, Greiner, EC and Boyce, W. 1984. Subcutaneous filariasis (*Pelecitus* sp.) in a yellow-collared macaw (*Ara auricollis*). *Avian Diseases*, 29, 891-194.
- Bartlett, CM and Greiner, EC. 1986a. *Pelecitus ceylonensis* n.sp. from the chick and ash dove, experimentally infected with larvae from *Mansonia crassipes*, and naturally-infected crows in Ceylon. *Ceylon Journal of Science and Biological Sciences*, 7, 96-104.
- Bartlett, C. M. and Greiner, E. C. 1986b. A revision of *Pelecitus* Railliet & Henry, 1910 (Filaroidea, Dirofilarinae) and evidence for the "capture" by mammals of filaroids from birds. *Bulletin du Museum national d'Histoire naturelle, Paris*, 4th ser., 8, 47-99.
- Bennett, GF, Greiner, EC, Whiteley, PL and Norman, FI. 1977. Blood parasites of some waterfowl from Victoria, Australia. *Journal of Wildlife Diseases*, 13, 202-204.
- Clark, P, Boardman, W and Raidal, SR 2009. *Atlas of Avian Haematology*, London, Blackwell.
- Dissanaike, AS and Fernando, MA. 1974. *Pelecitus galli* n. sp. from the Malayan jungle fowl *Gallus gallus spadiceus*. *Journal of Helminthology*, 48, 199-203.
- Greve, JH, Graham, DL and Nye, RR. 1982. Tenosynovitis caused by *Pelecitus calamiformis* (Nematoda: Filaroidea) in the legs of a parrot. *Avian Diseases*, 26, 431-436.
- Guilidal, JA and Settnes, OP. 1968. Peritracheal filariasis in a pigeon caused by *Pelecitus clava* (Wedl, 1856). *Nord. Veterinaarmed.* 20, 68-70.
- Mackerras, MJ. 1962. Filarial parasites (Nematoda: Filaroidea) of Australian animals. *Australian Journal of Zoology* 10, 400-457.
- Mawson, PM, Angel, LM and Edmonds, SJ. 1986. A checklist of helminths from Australian birds. *Records of the South Australian Museum*, 19, 219-325.
- Pizarro, M, Villegas, P, Rodriguez, A. and Rowland, GN. 1994. Filariasis (*Pelecitus* sp.) in the cervical subcutaneous tissue of a pigeon with trichomoniasis. *Avian Diseases* 38, 385-389.
- Reppas, GP, Hartley, WJ and Gill, PA. 1995. Microfilaraemia in Australian native birds. *Australian Veterinary Journal* 72, 356-357.
- Rutherford, DM and Black, H. 1974. *Pelecitus*, a peritracheal nematode in the pigeon. *New Zealand Veterinary Journal* 22, 147.
- Spratt, DM. 2010. *Pelecitus bartneri* sp. nov. (Nematoda: Filaroidea) from the subcutaneous tissues of the leg of *Psephotus chrysopterygus* Gould, 1858 (Psittaciformes). *Transactions of the Royal Society of South Australia* 134, 172-176.
- Spratt, DM and Varughese, G. 1975. A taxonomic revision of filaroid nematodes from Australian marsupials. *Australian Journal of Zoology*, 35, 1-99.