Oropharyngeal Polyps in a Sulphur Crested Cockatoo

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Case

A 3yr old male sulphur crested cockatoo (*Cacatua galerita)* was presented for a post purchase examination. The owners had purchased him from a pet shop 2 days prior to presentation. They had noticed that he did not seem to have as much powder on his feet and beak as their older (20 years) sulphur crested cockatoo and had found an old wound on the ventral aspect of the mandible. Very little was known of the bird's history prior to purchase except that he had been hand raised and living as an indoor pet bird.

The bird was in good body condition, weighing 846g. There was mild staining of the feathers above the nostrils, an old healing wound on the ventral mandible and powder down feathers over the thighs were longer than normal and very thin. Minimal powder was present in the plumage. Examination of the mouth revealed pigmented masses in the choanal slit.

The bird was admitted to hospital for closer examination of the masses under general anaesthesia. Isoflurane and oxygen were administered by facemask and the bird was then intubated with a size 3 uncuffed endotracheal tube. Swabs were taken from the conjunctiva, choana and vent for Clearview test. Feather quills were plucked and blood collected for HA HI and PCR testing for circovirus. The choana, trachea, oesophagus, crop and cloaca were examined endoscopically and biopsies of 2 discrete polypoid masses in the choana were collected for histology.

The cranial third of the trachea appeared mildly inflamed. No abnormalities were found in the oesophagus, crop or cloaca.

As the bird was also showing possible signs of circovirus infection and the owners had other young birds at home that may have been at risk from exposure to this virus the decision was made to euthanase the bird rather than pursue treatment options. Post mortem was performed and no other abnormalities were grossly apparent. Samples of myocardium, liver, spleen, kidney, lung and trachea were submitted for histopathology.

Differential diagnoses

Possible causes of proliferative lesions in the oropharyngeal mucosa include viruses (eg poxvirus), hyperkeratosis due to hypovitaminosis A, candidiasis, trichomoniasis, papillomas or neoplasia.[1]

Poxvirus lesions in psittacines generally take the diphtheroid or wet form. These are exudative lesions which may become secondarily infected and appear as caseous plugs or plaques in the choana or oropharynx.[2] The presence of intracytoplasmic inclusion bodies (Bollinger bodies) on

cytology is characteristic of poxvirus. To the best of our knowledge psittacine poxvirus has not been reported in Australia.

Hypovitaminosis A lesions normally appear as discrete pale swellings on the margins of the choanal opening, along the sides of the tongue and in the intermandibular space. Cytology usually shows cornified squamous epithelial cells without inflammation.[2]

Candida is an opportunistic pathogen that usually occurs secondary to other infections or in birds with compromised or immature immune systems. Candida lesions usually appear as white plaques.[3]

Trichomoniasis usually appears as white or yellow plaques, exudates or nodules. Direct wet mounts of the exudate or scrapings of the lesion usually reveal the flagellated protozoan that has caused the lesion.[2]

The gross appearance of the lesions in this bird did not appear consistent with poxvirus, candidiasis, trichomoniasis or hyperkeratosis. Neoplasia is uncommon in the upper respiratory tract of birds however papillomas, squamous cell carcinoma, fibrosarcoma and a malignant melanoma have been reported.[3, 4,5]

Laboratory Results

Clearview test was negative.
Circovirus antibody titre (HI) = negative
Circovirus antigen titre (HA) > 40960
PCR circovirus positive.

The sections of respiratory mucosa and submucosa from the choana revealed multifocal accumulations of lymphocytes and plasma cells within the lamina propria, which were overlain by mildly hyperplastic epithelium. The pathologist considered this to indicate a diagnosis of inflammatory polyps. No abnormalities were found in any of the other tissues submitted.

Inflammatory polyps

Inflammatory polyps are commonly seen in cats but not often reported in other species. They are non-neoplastic masses generally arising from the mucosa of the nasopharynx, auditory canal or middle ear.[6, 7] Usually feline inflammatory polyps appear as grey-pink to white, oval to elliptical pedunculated masses. Histologically they comprise either stratified squamous or columnar epithelium overlying a core of well vascularized fibrous connective tissue. Lymphocytes, plasma cells and macrophages are prominent in the submucosa and may also be found scattered throughout the stroma.[6]

Possible aetiologies

The pathologist described the lesions in this sulphur crested cockatoo as “non-specific chronic inflammatory lesions for which an underlying aetiology is not apparent” and advised consideration of a low-grade infectious process or hypersensitivity response to an inhaled foreign body.

A negative Clearview test did not necessarily rule out the presence of *Chlamydophila psittaci* infection as this test is noted for a high rate of false negative results. An antibody test for *Chlamydophila psittaci* was not performed as it was felt this would only indicate past exposure to the disease and not confirm current infection. Presence of antibodies may have increased the index

of suspicion for the presence of *Chlamydophila psittaci* but with no evidence of the presence of antigen infection would be difficult to prove. No abnormalities that may have indicated *Chlamydophila psittaci* infection were detected in the post-mortem tissue samples submitted.

Special stains and cultures for bacteria and fungi were not performed.

Hypersensitivity lesions are due to exaggerated interactions between antigen and normal cell mediated immune mechanisms resulting in an inflammatory reaction. The inciting antigen may be in the form of bacterial antigens, virus infected cells or foreign low molecular weight materials capable of binding to peptides on the surface of cells to form new antigens.[13] No evidence of a foreign body was found, although some dust like debris was present in the choana on endoscopy. Nothing similar was found in the trachea. Exposure to cigarette smoke or similar inhaled irritants or toxins cannot be ruled out for the period prior to purchase. The bird had only been with the owners 48 hours.

The aetiology of feline inflammatory polyps is unknown. One theory is that they may be congenital arising from remnants of the branchial arches. This theory is primarily based on the higher incidence in young cats. However the disease is also seen in middle aged and older cats.[6] This sulphur crested cockatoo was reported to be only 3 years old. As this was the first time this bird had been presented we have no way of knowing how long the polyps had been present. The possibility that these polyps were a congenital deformity cannot be ruled out.

The involvement of viruses in the aetiology of feline inflammatory polyps has been suggested but as yet not proven. Feline calicivirus causes a pyogranulomatous reaction in other tissues, which is similar histologically to that seen in inflammatory polyps. However a recent study failed to detect feline calicivirus or feline herpes virus-1 in polyp tissue.[7] Fibropapillomatosis of green sea turtles, which is reported to have a similar histopathological appearance to feline inflammatory polyps, has been associated with an increased incidence of antibodies to a herpes virus [7]. It has been proposed that the virus may initiate the formation of lesions in turtles and then be cleared by the inflammatory process.[7] This suggestion is supported by findings with green sea turtle fibropapillomatosis in which herpes virus was isolated more commonly in immature experimentally induced tumours than in mature spontaneously occurring tumours.[8]

Fibropapillomatosis in green sea turtles most commonly occurs in a cutaneous form however in 2002 oropharyngeal fibropapillomatosis was reported in Hawaiian green turtles.[9]As birds have evolved from reptiles and still retain some reptilian-like anatomical features is it feasible to assume that histopathological changes in birds will be more similar to those of reptiles than mammals? Could these lesions in the oropharynx of the cockatoo have been behaving more like a form of fibropapilloma than an inflammatory polyp? With this in mind, and the possible link between virus infection and fibropapillomatosis the question arises as to the part, if any that the concurrent circovirus infection played in the formation of these polyps. Could it have triggered the formation of the polyps and then moved on? Did it increase the bird's susceptibility to other agents that caused the polyps? Or is it totally unrelated?

A review of the slides by the pathologist revealed no similarities between the lesions in this bird and fibropapillomas of green sea turtles.

Summary

It appears that the diagnosis of inflammatory polyps is more a descriptive diagnosis than an indication of a specific disease or syndrome in birds.

At the AAVAC conference in 2001 a case of a possible inflammatory polyp in the ear canal of a sulphur crested cockatoo was reported.[10] Infection was present in this case making histological diagnosis difficult. It was not possible to determine whether infection was the primary precipitating factor or secondary to polyp formation.

Polypoid masses have also been described in the sinuses of a scarlet macaw[11] and nasal passages of a duck[12]. In the scarlet macaw the mass was diagnosed histopathologically as a multilobulated inflammatory polyp. Aerobic bacterial and fungal cultures were negative as were special staining for bacteria, fungi and acid-fast organisms.[11] A multilobed granular polyp was found in the duck and *Rhinosporidium seeberi* retrieved from lesions in the polyp. It is not clear whether *Rhinosporidium* was the primary cause of the lesions or merely a secondary invader.

The polyps in this case were an incidental finding. We do not know how long they had been present or how, if at all, they had been affecting the bird. The sinuses were opened and examined during post mortem and no abnormalities were detected.

Culture or staining for bacteria and fungi may have been helpful in determining an aetiology, although these procedures were reported to be unrewarding in similar cases.

There appear to be no clear answers as to the aetiology of these polyps either in this bird or in the small number of similar cases reported. Our aim in reporting this case was merely to raise the questions we asked ourselves in investigating this unusual presentation and perhaps to stir some thoughts in others.

Bibliography

1. Tully, T.N; Harrison, G.J *Pneumonology* in Ritchie, B.W; Harrison, G.J; Harrison, L.R. Avian Medicine: Principles and Application. Lake Worth, Fl. Wingers Publishing, 1994: 556- 581.

2. Hoefer, H. *Diseases of the Gastrointestinal Tract* in Altman, R.B; Clubb, S.L; Dorrestein G.M & Quesenberry, K. (ed) Avian Medicine and Surgery. WB Saunders: Philadelphia 1997: 419-453

3. Tully, T.N *Avian Respiratory Diseases: Clinical Overview* Journal of Avian Medicine & Surgery 1995: 9(3) 162-174

4. Hillier, E.V; *Clinical Manifestations of Respiratory Disorders* in Altman, R.B; Clubb, S.L; Dorrestein G.M & Quesenberry, K. (ed) Avian Medicine and Surgery. WB Saunders: Philadelphia 1997: 394-411

5. Latimer, K.S *Oncology* in Ritchie, B.W; Harrison, G.J; Harrison, L.R. Avian Medicine: Principles and Application. Lake Worth, Fl. Wingers Publishing, 1994: 640-672

6. Pope, E. *Feline Inflammatory Polyps* Seminars in Veterinary Medicine and Surgery (Small Animal), 1995: 10 (2) 87-93

7. Veir, J.K; Lappin, M.R; Foley, J.E; Getzy, D.M. *Feline Inflammatory Polyps: historical, Clinical and PCR Findings for Feline Calici Virus and Feline Herpes virus-1 in 28 Cases* Journal of Feline Medicine and Surgery 2002: 4, 195-199

8. Herbst L.H, Greiner E.C, Erhart L.M, Bagley D.A, Klein P.A *Serological association between spirorchiadiasis, herpesvirus infection and fibropapillomatosis in green turtles from Florida.* Journal of Wildlife Diseases 1998: 34, 496-507.

9. Aguirre, A.A; Balazs, G.H; Spraker T.R; Murakawa, S.K.K; Zimmerman, B. *Pathology of Oropharyngeal Fibropapillomatosis in Green Turtles Chelonia mydas.* Journal of Aquatic Animal Health 2002: 14: 298 - 304

10. Monks, D *A Possible Inflammatory Polyp in a Sulphur Crested Cockatoo* Annual Conference Proceedings Australian Committee Association of Avian Veterinarians 2001:57-59

11. Pye, G.W; Bennett, R.A; Newell, S.M; Kindred, J; Johns, R; *Magnetic resonance imaging in psittacine birds with chronic sinusitis.* Journal of Avian Medicine & Surgery. 2000. 14: 4, 243-256.

12. Davidson, W.R. Nettles, V.F. *Rhinosporidiosis in a wood duck.* Journal of the American Veterinary Medical Association. 1977. 171: 9, 989-990.

13. Roitt, I.M; Delves, P.J: *Hypersensitivity* in Roitt's Essential Immunology 10th Edition Blackwell Science 2000: 322-348