

# THE USE OF CT IMAGING TO ASSESS SINUS DISORDERS IN BIRDS

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## **Introduction**

Upper respiratory tract disorders in birds have long been a source of frustration for veterinarians treating them. The combination of a complex arrangement of sinuses and diverticula and the formation of caseous plugs of purulent material and debris within these chambers has made the assessment of the extent and severity of a sinus disorder difficult.

Radiographic assessment is made difficult by the complex anatomy of both the skull and the sinuses. Overlay of these structures, and soft tissue structures such as the brain, eyes and oropharynx, presents the clinician with an almost impossible task when assessing sinus disorders. The use of contrast media (sinography) instilled via a nasal flush or injection into a sinus does help somewhat, but knowledge of normal vs abnormal anatomy is lacking in many species.

Newer imaging modalities such as computerised tomography (CT) and magnetic resonance imaging (MRI) offer the clinician newer and more accurate means of assessing upper respiratory tract infections.

## **Case reports**

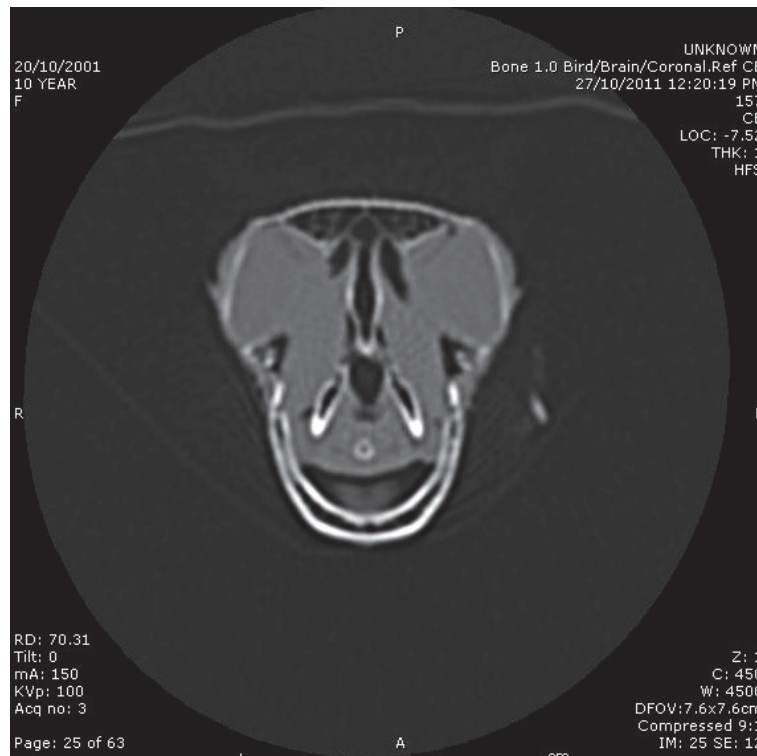
1. A juvenile Alexandrine parrot (*Psittacula eupatria*) was presented for chronic sneezing and a right-sided mucopurulent oculonasal discharge. The owner reported that this problem had been present, and persisted, since the bird was purchased 1 month previously. The referring veterinarian had treated it unsuccessfully with oral enrofloxacin (Baytril Oral, 10mg/kg BID PO 7 days). On examination the bird was in good body condition and did not exhibit any facial swelling or dyspnoea. A mucopurulent discharge was evident from the right nare and medial canthus of the right eye. There was no evidence of conjunctivitis. The left eye and nare appeared normal.

Bacterial culture from the choana grew a heavy mixed growth of bacteria. Chlamydial serology (Immunocomb, Biogal) was a suspect positive. The bird was treated with oral doxycycline for two weeks after which it was noted that the discharge, although now mucoid, was still present.

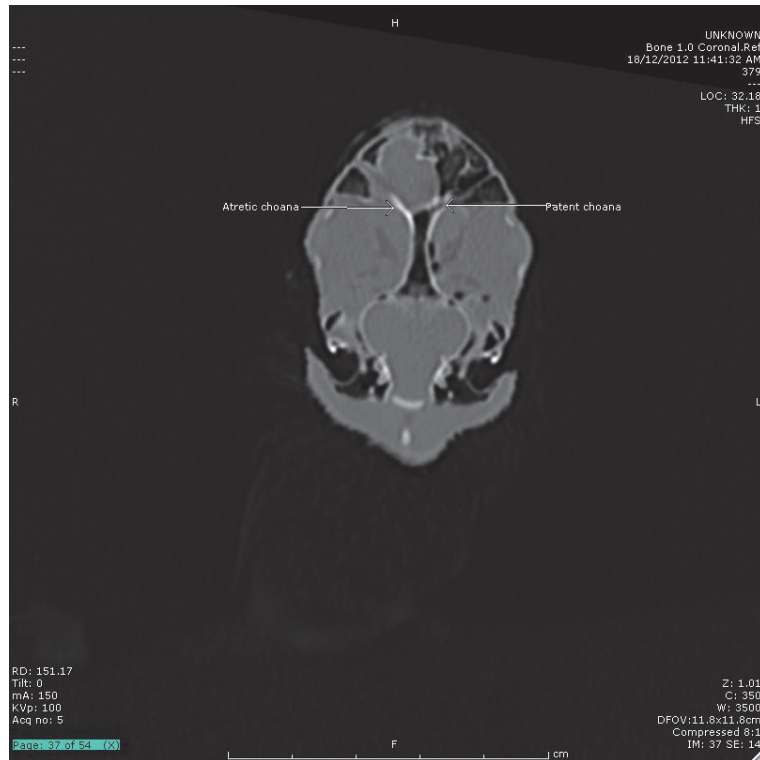
Evaluation of the skull using a 16-slice helical CT scanner demonstrated that the right internal nare was not patent. A soft tissue density, consistent with mucus, was present in the right infraorbital sinus. Endoscopic evaluation of the proximal choana confirmed the diagnosis of unilateral choanal atresia.

Choanal atresia is a congenital problem most commonly reported in Grey parrots (*Psittacus erithacus*) (Harris, 1999). The author has seen it in several Indian Ringneck parrots (*Psittacula krameri*) (Doneley,

personal observation). It is usually bilateral. Harris (1999) describes a treatment technique using a Steinman pin to create an internal nare and a plastic stent to keep it patent while epithelialisation of the fistula occurs. This treatment was attempted several times without success in this patient, presumably because of a failure of the epithelialisation process. The bird continues to do well, albeit with a persistent oculonasal discharge.



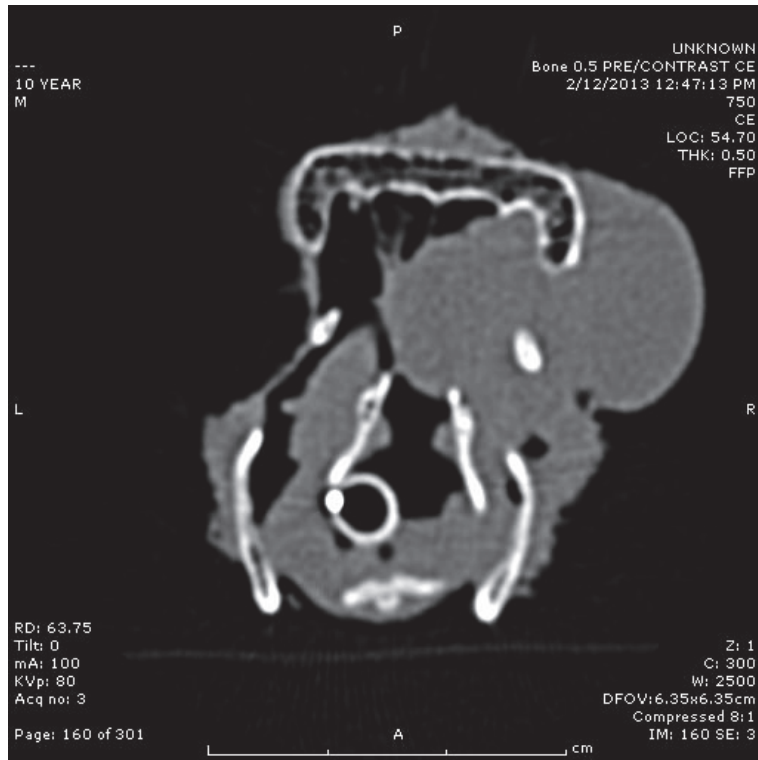
**Figure 1.** Normal choanae in an unrelated Alexandrine parrot



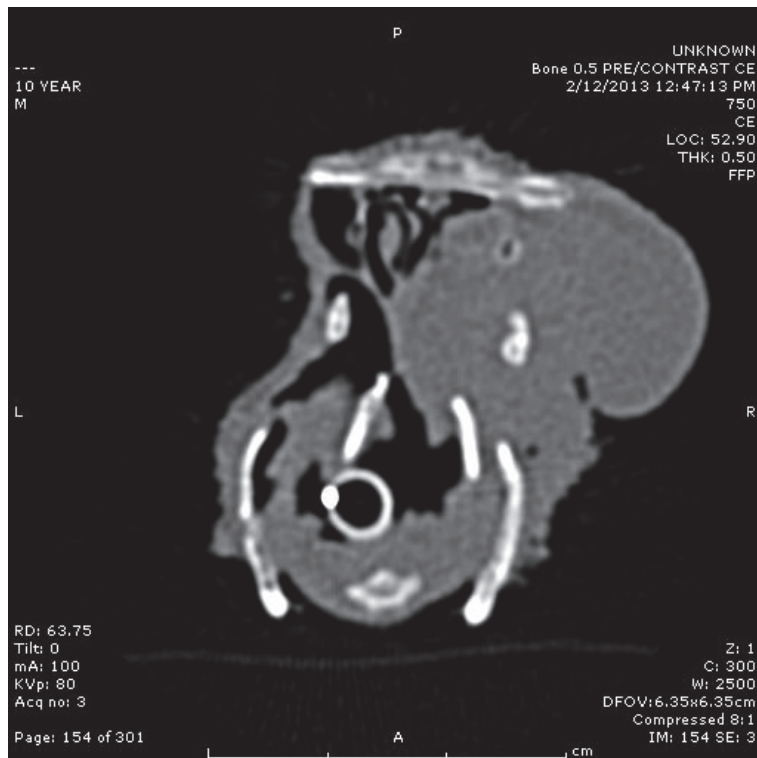
**Figure 2.** Unilateral choanal atresia in an Alexandrine parrot. Note the soft tissue density in the sinus above the atretic internal nares

2. An adult Long-Billed Corella (*Cacatua tenuirostris*) was presented for slight right-sided exophthalmos and a right-sided distension of the skin between the medial canthus of the right eye and nares. The bird had previously been diagnosed with a cryptococcal sinusitis (*C gatti*) and treated twice by surgically debulking the gelatinous material found in the pre-orbital diverticulum of the infra-orbital sinus, followed by itraconazole therapy for 1-3 months.

CT evaluation with a 16-slice helical scanner was performed to assess the extent of the sinus involvement. It was found that a soft tissue opacity, consistent with a gelatinous mass, was present throughout most of the right infra-orbital sinus. Radical surgical debulking followed by long-term itraconazole therapy (6 months plus) has kept the infection at bay, although the owner feels that it has not completely resolved.



**Figure 3.** Cryptococcal sinusitis in a Long-Billed corella. Transverse section immediately caudal to the nares



**Figure 4.** Another transverse section, rostral to the eyes.

## ***Discussion***

The complex anatomy of the upper respiratory tract makes diagnosis and assessment of sinus disorders sometimes difficult. Radiographic visualisation is complicated by the overlay of both bony and soft tissue structures within the skull.

In both these cases the diagnosis could have been made by other means (e.g. endoscopy, sinus aspiration and cytology) but CT scanning revealed the extent and severity of each condition, allowing a more directed treatment.

CT offers the clinician an opportunity to obtain a better idea of the extent and severity of sinus disorders in birds. As the availability of scanners increases and the cost decreases, veterinarians will be able to make better use of this technology to reach a diagnosis, formulate a treatment plan and give clients a more accurate prognosis.

## ***References***

Harris D. 1999. Resolution of choanal atresia in African Grey parrots. *Exotic DVM* 1, 13-18.