The Differential Diagnosis of Avian Splenomegaly

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Introduction

Normal adult splenic sizes (lengths) are: budgerigar 1-2 mm; lovebird, cockatiel 3-4 mm; Amazon parrot 7-8 mm. The shape of the spleen varies with species. It is oval in psittacines and galliforms, elongated to comma-shaped in passerines and very long and narrow in gulls.

Splenic size may be evaluated radiographically. Splenomegaly is more consistently seen on the lateral view with the spleen situated between the proventriculus and gizzard. Its image may overlap the proventriculus or may be seen dorsally. Gross enlargement of the spleen may slightly displace the liver or gizzard.

The spleen is often enlarged in birds that have an active infection. Hepatomegaly is often also present. If splenomegaly is present at necropsy, further diagnostic measures are indicated (*Chlamydia* antigen test, impression smear, culture, histopathology).

Differential diagnosis

Chlamydia

Bacteria	enterobacteraceae (*Salmonella*, *E coli*)
	Yersinia
	Mycobacterium
	Erysipelothrix
	Streptococcus
	Listeria
	Borrelia
	Other (*Pasteurella*, *Pseudomonas*, *Aeromonas* etc)
Viruses	Polyomavirus
	Herpesvirus (including Pacheco's disease of parrots)
	Adenovirus
	Reovirus
	Circovirus
	Goose parvovirus
	Big liver and spleen disease agent ?

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Parasites (protozoan)	*Plasmodium* (malaria)
	Haemoproteus
	Leucocytozoon
	Toxoplasma
	Isospora
	Lankesterella
Neoplasia	Lymphoid
	Myeloid
	Erythroid

Diagnostic procedures

By far the most important consideration, especially from a public health point of view, is chlamydiosis. I believe specific testing for *Chlamydia* should be recommended in almost all cases of avian splenomegaly. Failure to do so could leave a veterinarian vulnerable to a significant claim for damages, especially personal damages.

It is also important to note that not all cases of chlamydiosis present with splenomegaly. In some birds fibrinous air sacculitis may be the main necropsy finding.

Swabs of spleen, liver or air sac may be tested for *Chlamydia* antigen using commercial tests for *Chlamydia trachomatis* which cross-react with *Chlamydia psittaci*. False positives may occur due to cross reaction with members of the enterobacteraciae but appear to be less of a problem than when testing faeces or intestinal contents.

Histopathologic evaluation of a range of tissues including spleen remains the most economical way of screening for a wide variety of agents and may enable specific identification of the offending organism or at least provide a very high index of suspicion. In the case of chlamydiosis, histopathology is of value to demonstrate microscopic lesions consistent with the disease (histiocytic and lymphoplasmacytic inflammation of the parenchymal organs, especially spleen and liver, and fibrinopurulent to granulomatous air sacculitis). In some but not all cases of chlamydiosis the organisms can be visualised (using either standard H&E stained sections or special stains such as Gimenez, modified PVK Gimenez or Machiavello).

Other tests available for detection of *Chlamydia* include immunofluorescence testing of impression smears of spleen or liver, immunofluorescence testing of histologic sections, PCR detection of conserved *Chlamydia* DNA sequences in tissues or swabs and isolation of the organism from tissues or swabs.

In other bacterial infections of the spleen, the offending organism can often be visualised on Gram stained impression smears of the cut surface of the spleen. Suspected cases of mycobacteriosis should be evaluated using an acid fast (Ziehl Neelsen) stain. Tissue phases of protozoan parasites such as *Plasmodium* and *Lankesterella* may also be readily identified on impression smears using Romanowsky-type stains.

Bacteriological culture may be of value to specifically identify organisms visualised on Gram stained smears, or where bacteria cannot be detected on impression smears because the organisms are sparse or intracellular (e.g. *Salmonella*).

More sophisticated techniques such as virus isolation, DNA hybridisation and PCR are not widely used in routine avian diagnostics and are usually reserved for research projects and in depth investigations. However that situation may change as some of the newer technologies become more economical and user friendly.

Our knowledge of infectious agents in humans and animals is far from perfect. New agents continue to be discovered (e.g. equine morbillivirus) and our understanding of known agents continues to evolve (e.g. big liver and spleen disease of chickens). It is quite possible that there are unrecognised infectious agents causing splenomegaly in birds we currently investigate.

References

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