Psittacine Beak and Feather Disease (PBFD) in Birds

Drs. Foster & Smith Educational Staff

Psittacine Beak and Feather Disease (PBFD) is a contagious, fatal viral disease that affects the beak, feathers, and immune system of birds belonging to the Psittacidae family. It was first recognized in 1975 by veterinarians in Australia, where the disease affects wild birds. Although birds showing signs of disease usually die, it is common for birds to be exposed to the virus, develop a mild infection, and recover.

What birds are at risk for PBFD?

PBFD has been diagnosed in over 40 species of psittacines, mostly in Old World members of the parrot family. PBFD is seen more often in cockatoos, but Eclectus parrots, lovebirds, budgies, and African grey parrots are also affected. Younger birds are more commonly affected, especially with the acute form of the disease. Most birds diagnosed with psittacine beak and feather disease are under 2 years of age.

What causes PBFD?

PBFD is caused by a DNA virus that affects the cells of the immune system and those that produce the beak and feathers. The virus is a circovirus, which is one of the smallest viruses known to cause disease. A similar virus affects doves and other birds.

How is the virus that causes PBFD transmitted?

PBFD is extremely contagious. Large amounts of the virus, which can become airborne, are found in the droppings, contents of the crop, and the feather dust of infected birds. The feather dust is easily dispersed and can contaminate food, water, cages, clothing, and other areas of the environment. Psittaccine beak and feather disease is thought to be transmitted by inhalation or ingestion of the virus. It has been suggested that the virus may be transmitted in utero from the female bird to the egg.

The incubation period (time between exposure to the virus and the development of signs) can be as short as 3-4 weeks, or up to several years, depending upon the amount of virus transmitted, the age of the bird, the stage of feather development, and the health of the bird's immune system.

What are the signs of PBFD?

There are both acute and chronic forms of the disease.

Peracute/Acute Form: The peracute and acute forms most commonly occur in very young birds, and may begin with signs unrelated to the beak or feathers. Affected birds are often depressed and regurgitate due to crop stasis. They may develop a diarrhea-causing enteritis or pneumonia, and die without displaying any lesions of the feathers or beak. This is often called the peracute form of the disease. In the acute form, juveniles losing their down and developing feathers may have lesions on the feathers, including circular bands around the feathers which constrict the feather at its base. These feathers are often loose, break easily, may bleed, and are very painful.

Common Signs of Psittacine Beak & Feather Disease	
Acute Form	**Chronic Form**
Depression Regurgitation and diarrhea Loss of appetite and weight Abnormal feather development Death	Loss of feather dust and powder Abnormal feather development Abnormal growth and deformities of the beak Necrotic beak and oral lesions Secondary infections Death in months to years

Chronic Form: In the chronic form of PBFD, which is more common in older birds, the powder-down feathers are often the first feathers affected. The feathers are fragile and fracture easily, have constricting bands, may hemorrhage, and may be discolored, deformed, or curled. As the feather follicles are damaged, the bird will soon be unable to replace feathers, and the primary, secondary, tail, and crest feathers are lost. Bare skin is exposed, and the normal feather dust is not found on the body or the beak, where it normally accumulates due to preening. Feather abnormalities, often termed " dystrophic feathers," may not appear until the first molt after infection, which could be a period up to 6 months.

The beak may develop irregular sunken areas. Brown necrotic areas may be found inside the upper beak, and the beak may elongate, become deformed, and fracture. Secondary beak and oral infections often occur. In some birds, the nails can also be

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deformed or slough.

Mucus in the droppings, or a green tint to the droppings may occur. In some birds, the liver will be affected, and liver failure may be the cause of death.

Birds with the chronic form of the disease may live for months to years before dying of a secondary infection. This long period of illness in which the bird may be featherless, and gradually weakens can be very emotionally difficult for owners.

How is PBFD diagnosed?

The review of the medical history, presence of clinical signs, and observations during the physical exam support the diagnosis of PBFD. Other conditions such as nutritional deficiencies, infection with polyomavirus (causes budgerigar fledgling disease and other diseases of psittacines), hormonal abnormalities, and drug reactions can cause lesions on the feathers similar to PBFD. Histopathology (microscopic examinations of biopsies) can confirm the diagnosis. Affected cells will have abnormalities in their nuclei, called "basophilic intranuclear inclusion bodies." The diagnosis may also be confirmed by a PCR (polymerase chain reaction) test on whole blood or biopsy samples from the affected bird. The test detects the presence of the virus. This test may also be used on swabs of surfaces in the environment to detect contamination.

False positive and false negative test results can occur. For example, infected airborne cells could contaminate a sample and cause a false positive result. Healthy birds with a positive test result should be retested after 90 days. If they still have positive test results, they should be considered carriers of the virus. If the retest is negative, the bird may have eliminated the virus, and become immune.

False negative results may occur if too much anticoagulant is present in the sample, an extremely high number of viral particles are present and interfere with the test, or there are an insufficient number of infected white blood cells in the sample.

How is PBFD treated?

There is no specific treatment for PBFD. Supportive care including good nutrition, supplementary heat (incubator), beak trimming, and treatment of secondary infections can be offered. The disease, however, is progressive, and very few birds recover. Euthanasia may need to be considered for birds with severe and/or painful signs. Birds who die a natural death usually succumb to a secondary bacterial, fungal, or viral infection despite treatment, since their immune systems have been critically suppressed. Most birds die within 6 months to 2 years of developing the disease.

How is PBFD prevented and controlled?

Birds should be purchased from suppliers with disease-free birds. New birds coming into facilities should be quarantined and tested. Repeat testing in 3-4 weeks to allow for the incubation period is recommended. Infected birds should be isolated and removed from breeding programs. Juvenile birds should be housed separately from adults. Bird owners need to understand that if they handle other peoples' birds, it may be possible for them to bring the virus into their home and infect their birds. Good hygiene and sanitation should be used. There is no known disinfectant that kills this virus.

In Australia, a killed vaccine has been developed which can protect unexposed birds; it can cause more severe disease in birds already showing signs of PBFD. Birds should be vaccinated as young as possible, as soon as 14 days of age. The vaccine should be boostered after one month, and breeding birds should be vaccinated one month prior to breeding.

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