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A Case Report and Discussion Of Laryngotracheitis in Chickens

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Introduction

Respiratory diseases of poultry are some of the most costly problems plaguing today's poultry industry. These respiratory diseases can be devastating to commercial and backyard flocks. Veterinarians in Iowa are occasionally asked to deal with acute respiratory disease outbreaks in one of the many backyard flocks in the state. One disease that must be considered under these circumstances is infectious laryngotracheitis (ILT). Few cases of ILT are diagnosed each year in Iowa. There may be more ILT cases which are incorrectly diagnosed due to the nondescript clinical signs of this disease.

Case Report

On January 9, 1985 six dead adult laying chickens were submitted to the Iowa State University Diagnostic Laboratory. All chickens in a flock of 50 were sneezing, had watery eyes, and had crusted exudate on the external nares. The flock also exhibited a decline in egg production and feed consumption. Fifteen birds died within seven days of the onset of clinical signs. At necropsy, the trachea and nasal cavity contained copious amounts of mucus and fibrin. Several birds had swollen livers. Histologically, severe necrotizing tracheobronchitis was observed. Basophilic intranuclear inclusion bodies were occasionally seen in the remaining tracheal epithelium. Occasional areas of necrosis were observed in the liver. Virus isolation attempts from tissues were positive for the presence of ILT virus.

Discussion

Infectious laryngotracheitis is caused by a herpesvirus. It is classified in the subfamily Alphaherpesviridae which contains many of the herpes viruses found commonly in Iowa livestock such as infectious bovine rhinotracheitis, equine rhinopneumonitis, pseudorabies, and feline rhinopneumonitis.⁶ Distinct immunologic strains have not been isolated, although some variations in neutralizing abilities have been demonstrated between strains of varying pathogenicity.^{2,14,15} The incubation period of ILT virus is relatively long. Signs appear 6–12 days following natural exposure.⁹ The disease, if uncomplicated, will run its course in 10–14 days.

Infectious laryngotracheitis is a highly contagious disease of chickens. ILT has been demonstrated experimentally in pheasants and peafowl.³ All ages of chickens can be infected. The period of greatest susceptibility is between 4 and 18 months.¹⁴

ILT virus is transmitted three ways with inhalation and intraocular spread being the primary means of exposure. The third and least likely path is oral ingestion. It is possible for this virus to be spread mechanically on fomites emphasizing the need for strict sanitation practices between flocks. Small barnyard flocks are often a reservoir of the virus.

Two forms of ILT are commonly observed. The acute form is characterized by nasal discharge, moist rales, and respiratory distress severe enough to cause chickens to extend their neck during inspiration. Expectorant may be blood tinged in the more severely affected birds. Sudden deaths and decreased egg production from 10–20% are common in the acute form of ILT. Morbidity may reach 100% and considerable mortality is common (10–70%). The second form of ILT is called the mild form, characterized by a state of un-

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thriftiness and decrease in egg production. Chickens with this less severe form may exhibit watery eyes, a persistent nasal discharge, and swelling in the infraorbital sinus.⁴

Diagnosis

Clinically, ILT may resemble various other diseases. A field diagnosis of ILT is suggested in an acute outbreak where birds are gasping and expelling blood through their external nares and mortality is high.^{5,19} Laboratory confirmation of ILT is necessary in acute and chronic outbreaks. Post mortem lesions are most consistently found in the trachea. Early in the disease (less than 5 days), increased tracheal mucus may be the only lesion. Later, blood and cellular debris from the necrotic tracheal mucosa may form cheesy cores in the tracheal lumen. The eyes, nasal cavity, and sinuses may be congested and edematous.¹

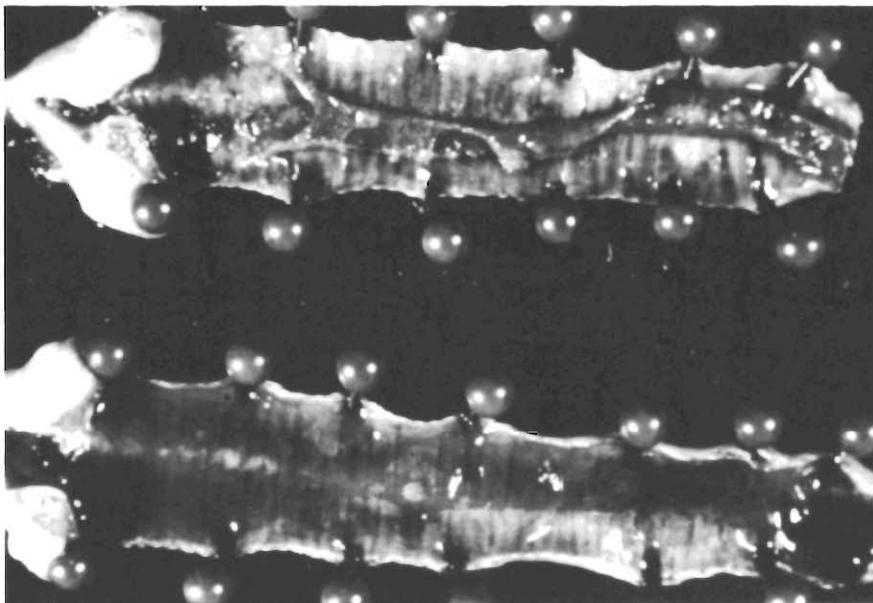
ILT has also been reported to affect lungs and air sacs.¹⁸ However, it is difficult to ascertain to what extent the lesions are due to ILT virus alone and to what extent other viruses, and bacteria, may contribute to lung and air sac lesions.¹¹

For diagnostic purposes, the best specimens are live, acutely affected, untreated birds. Diagnostic tests should include histopathology

and virology. Histopathology of the tracheal mucosa may reveal intranuclear inclusion bodies. One study indicates inclusion bodies are observed in 57% of the cases.¹³ If live affected birds can not be sent to a laboratory, tracheas can be fixed in formalin or in a low pH fixative which may aid in the preservation of inclusion bodies.⁴ Fresh specimens should always be included in a laboratory submission.

Virus isolation (VI) of ILT virus is accomplished by inoculating 9–12 day old embryonated chicken eggs with tracheal exudate or tracheal and lung suspension.^{8,12} ILT virus causes focal proliferations on the CAM (chorioallantoic membrane) which are examined histologically for intranuclear inclusion bodies.

Flourescent antibody tests, available in some laboratories, are used for rapid diagnosis of ILT. This test can give "same day" results compared to VI which may require from 5–14 days. Flourescent antibody tests depend on the quality of the submitted tissue. Tracheas from acutely affected live birds give superior results. Alternatively, fresh tissues from euthanized birds may be sent to the laboratory if sent in a sealed container and chilled (not frozen). Storage of tracheas for greater



Fibrino-hemorrhagic tracheitis characteristic of ILT. (Courtesy of H. J. Barnes)

than 48 hours prior to FA testing increases the possibility of false negative results.¹⁰

Treatment, Prevention, and Control

Drug therapy has not been effective in treating ILT. If a diagnosis of ILT is obtained early in an outbreak, vaccination of the unaffected birds may induce adequate protection due to the long incubation period of ILT virus.⁹ Vaccinates may be protected between the 2nd and 4th day post vaccination.⁸

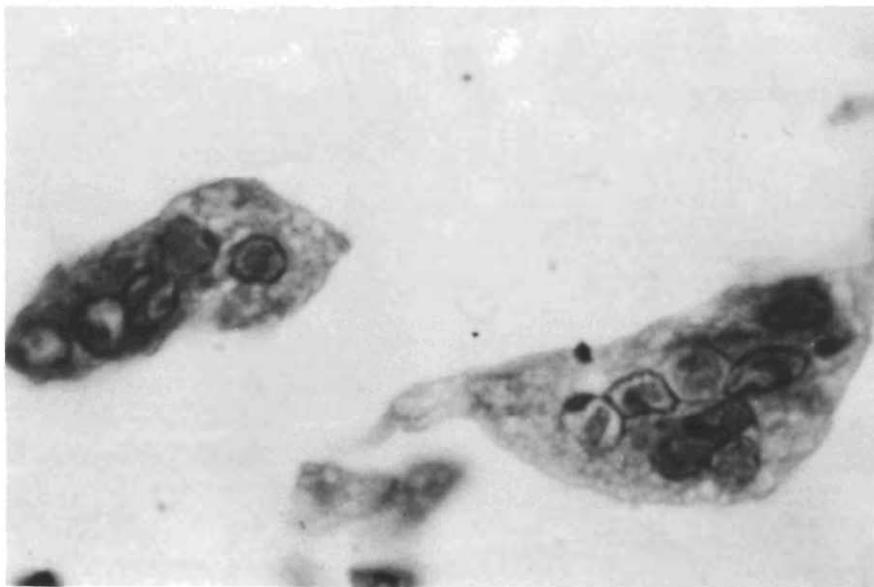
Since vaccination can result in asymptomatic carrier birds, it is recommended for use only in geographic areas where the disease is endemic.⁹ Most vaccines now in use are attenuated viruses or natural strains of low pathogenicity.²⁰ Various routes of exposure, such as infraorbital sinus injections, cloacal mucosal scrapings, intranasal instillations, feather follicle inoculation, and oral inoculation through the drinking water, have been used to administer the vaccine. Oral vaccination, although the simplest method, is the most susceptible to errors and is not approved by the USDA. The oral method seems to only pro-

vide protection when ILT virus comes into contact with the nasal cavity.¹⁶

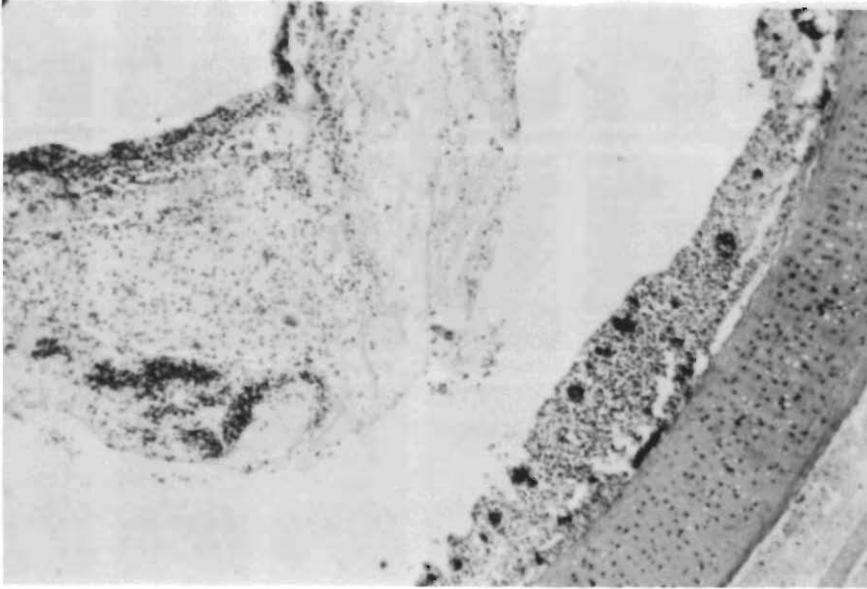
The method of administration currently most popular is the eye drop method where one drop of vaccine is instilled into the eye. In a commercial flock of layer hens, birds are commonly vaccinated at 10–12 weeks of age because they are being handled for pox vaccination at this time. Vaccination is often repeated at 18–20 weeks when the layers are housed for production.²⁰

A vaccination protocol for small chicken flocks is eyedrop vaccination at 4 weeks and then again at 16–18 weeks. This is only recommended in show flocks and exhibit birds in problem areas. Since ILT virus infections often result in some carrier birds, it is extremely important to avoid mixing vaccinated or recovered chickens with susceptible ones.

Prevention of ILT centers around sound sanitation practices. ILT virus can survive 10 days at temperatures of 13–23°C.¹⁷ Reducing virus contamination of buildings and clothing is an important consideration in preventing ILT. To inactivate ILT virus a solution of 3% cresol or 1% lye may be used, both are very effective.⁹



ILT intranuclear inclusion bodies in sloughed epithelial cells.



Histopathology of ILT epithelial necrosis and sloughing. Extensive inflammation in the tracheal submucosa.

Conclusion

In conclusion, ILT is a respiratory disease that requires laboratory help for a definitive diagnosis. With properly prepared diagnostic specimens the virus can be detected in a high percentage of the cases. Vaccination early in an outbreak of ILT can be an effective tool to decrease mortality and egg loss.

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