

GROSS LESIONS OF VELOGENIC
VISCEROTROPIC NEWCASTLE DISEASE
SLIDE STUDY SET #4

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IN COOPERATION WITH THE
CONTINUING EDUCATION COMMITTEE
OF
THE AMERICAN ASSOCIATION OF AVIAN PATHOLOGISTS

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These slides show the lesions most commonly observed in chickens that die of velogenic viscerotropic Newcastle disease (VVND). Not all of the lesions described in this report are present in all or even a large percentage of chickens. Very young chicks may die and have no grossly detectable lesions. It is not unusual to find an absence of gross lesions in mature chickens that die of VVND. There is considerable variability in the severity and incidence of gross lesions. This variation is influenced in part by species, age, level of immunity, challenge route and challenge strain.

The absence of lesions cannot be interpreted as evidence that VVND did not cause death. Final diagnosis is based on the isolation of Newcastle disease virus from dead or infected birds and the production of high mortality and viscerotropic lesions in susceptible chickens by experimental inoculation.

Virus isolation is commonly done in embryonating chicken eggs. Attempts to recover the virus from chickens exhibiting nervous

signs are often negative because of the presence of antibodies against Newcastle disease. There is ample time between the initial infection and the appearance of nervous signs for antibodies to be produced, especially in chickens with vaccination histories. Since viruses other than Newcastle will cause hemagglutination, specificity should be determined by the hemagglutination-inhibition test using specific Newcastle antiserum.

1. VVND produces severe depression and high mortality in chickens that have little or no immunity. Note the gaping chicken in the middle of the slide. Nervous signs commonly seen with neurotropic strains are not usually seen in nonvaccinated chickens. Nervous signs occur in chickens that survive for a long enough period for them to occur (usually 18-21 days). These chickens generally have a history of an earlier vaccination with low or even negative HI titers. Nervous signs may be observed in avian species that are capable of resisting the early lethal effects of the disease (turkeys, pigeons, parakeets, parrots).

VVND may produce declines in egg production and some mortality in flocks even with good vaccination programs. It is difficult to produce high levels of immunity in all chickens within a flock. Some chickens may become infected and shed virulent virus from the respiratory tract and in the feces while exhibiting little, if any, clinical disease. Greenish diarrhea is a common sign of infected chickens.

2. Infected chickens often have signs of cyanosis with dark, discolored combs.

3. Facial and neck edema can be severe, especially in younger chickens. When they are positioned for post mortem examination, straw-colored fluid may exude from the eye or nares.

4. Facial edema in a young chicken.

5. Facial edema in an adult chicken.

6. In broilers, edema in the sub-cutis of the neck region may be severe with highly virulent strains of VVND. There may or may not be severe tracheal involvement. The tracheal lesion is generally hemorrhage in the wall of the trachea without the presence of free-blood in the lumen. This trachea is more severely affected than is ordinarily seen.

7. The presence of hemorrhages in the lining of the proventriculus is one of the more commonly found lesions. These hemorrhages may be absent but when found are strong evidence in favor of a positive VVND diagnosis. Hemorrhages may also occur on the serosal surfaces of this organ.

8. When the lining of the ventriculus, or gizzard, is reflected occasionally erosions and hemorrhages will be seen. They occur in the presence and absence of hemorrhages in the proventriculus.

9. The intestines may have numerous small hemorrhages.

10. Perhaps the most consistent and dependable gross lesions of VVND are the hemorrhagic lymphoid foci. They occur in the duodenum and in other areas of the gut such as the cecal tonsils.

11. Hemorrhagic cecal tonsils and lymphoid patch as seen in an intact gut.

12. Hemorrhagic cecal tonsils.
13. Hemorrhagic cecal tonsils and lymphoid patch in an opened intestinal tract.
14. Cecal tonsils showing different degrees of involvement.
15. The upper gut has a hemorrhagic Merkel's diverticulum and a hemorrhagic lymphoid focus. The lower gut also came from a chicken that died of VVND but without similar involvement.
16. The large intestine and cloaca may show necrotic foci.
17. Hemorrhages may be seen in the margin of the vent. Note the hemorrhagic cecal tonsils in the opened gut.
18. Ovaries of infected hens are often shrunken. The stigmata may be hemorrhagic. The stigmata appears as a constriction, cutting down into the ovum.
19. Some ovaries have ova with areas of hemorrhage and necrosis.
20. Excessive yolk-like fluid is often observed in hens that die of VVND.

ACKNOWLEDGEMENTS

Slide 1 was donated by Dr. C. Kuniyasu, Tokyo, Japan and slide 5 by Dr. R.P. Hanson, University of Wisconsin.