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Popular Article

Enterotoxemia (Pulpy Kidney Disease) In Sheep (*Ovis aries*)

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Introduction

Enterotoxemia caused by *Clostridium perfringens* type D, sometimes also called “overeating disease” or “pulpy kidney disease,” is one of the most prevalent clostridial diseases of sheep and goats worldwide. The disease occurs rarely in cattle. Focal symmetrical encephalomalacia (FSE) is one of the lesions that may be seen in the sub-acute and chronic forms of type D enterotoxemia of sheep. Although *C. perfringens* is acquired by the oral route and reaches the intestine, disease development in infected animals is dependent upon predisposing factors including individual intestinal environmental conditions that determine local toxin production.

Etiology

Enterotoxemia caused by *Clostridium perfringens* type D. *clostridium perfringens* is a gram-positive, rod shaped, non-motile anaerobic, spore forming bacterium.

C. perfringens type D produces two types of toxins, namely alpha (CPA) and epsilon (ETX). Epsilon is the third most potent clostridial toxin, after botulinum and tetanus toxins.

Clinical Signs

Type D enterotoxemia in lambs is generally acute, with animals dying after a short period of mainly neurologic and respiratory signs, including convulsions, blindness, ataxia, head pressing, and paraparesis, tachypnea, and bawling.

Some animals may survive longer and show tachypnea, ptyalism, hyperesthesia, a wide-based



stance, head pressing, blindness, opisthotonos, and terminal convulsions or coma.

Diarrhea may occasionally be observed, but this is not a common clinical sign in ovine type D enterotoxemia. While *C. perfringens* type D ETX is usually incriminated in disease, a type D strain producing unusually high amounts of CPA was isolated from a lamb with hemolytic disease resembling “yellow lamb disease”, a form of enterotoxemia characterized by acute intravascular hemolysis, typically associated with CPA produced by *C. perfringens* type A.

Hyperglycemia, largely from rapid mobilization of hepatic glycogen, and marked glycosuria can be found in all forms of the disease, a diagnosis of type D enterotoxemia is not possible by the absence of hyperglycemia or glycosuria.

Gross Changes

In the acute form of type D enterotoxemia in lambs, carcasses are usually well nourished. There may be evidence of diarrhea, although this is an unusual finding in sheep.

Mild congestion and hemorrhage may sometimes be observed on the small intestinal mucosa, the small and large intestinal content may be moderately fluid, and the small intestine may be multifocally distended with gas, but no other gross changes are seen in the gastrointestinal tract. Pulmonary edema, with wide interlobar and interlobular septae (Figure.1) and a large amount of stable froth in the trachea and lower airways (Figure.2), is regularly found.

Hydropericardium (Figure.3), hydrothorax, and ascites, with or without strands of fibrin, are characteristic, but not consistent, post-mortem findings in sheep. Due to their high protein concentration, these fluids tend to clot when the respective cavities are opened. Other gross changes include sub-endocardial and sub-epicardial hemorrhages, which are particularly marked in the left ventricle, serosal hemorrhages, and hepatic and splenic congestion.

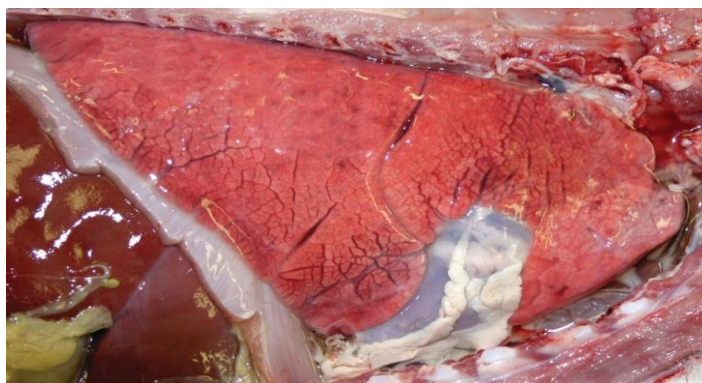


Figure 1 :Gross photograph showing pulmonary edema in a sheep. The interlobar and interlobular septae are diffusely expanded and filled by a clear fluid (edema)





Figure 2: Gross photograph showing large amount of froth in the airways of a sheep

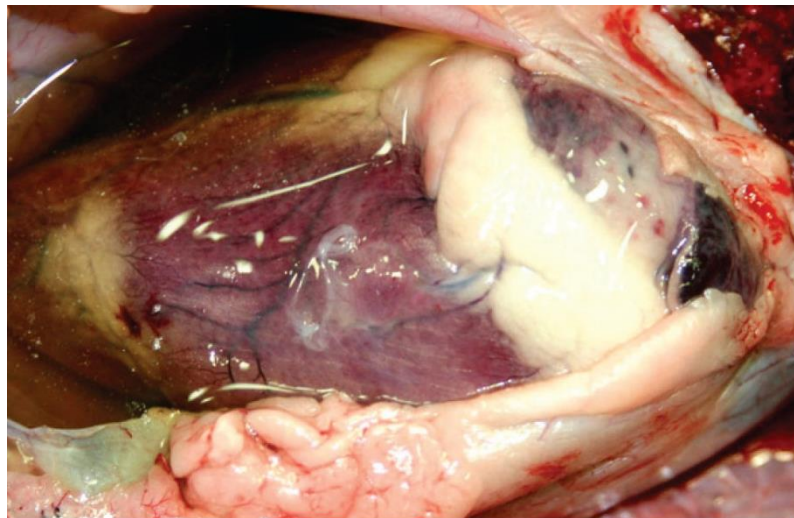


Figure3 : Gross photograph showing large amount of pericardial fluid and presence of fibrin strands, in heart (Hydropericardium) due to clostridium perfringens type D.

