CARdiovascular Diseases of Turkeys

I. Aortic Rupture or Dissecting Aneurysm

Aortic rupture is an occasional cause of mortality in 12-16-week-old heavy turkeys, characterized by massive internal hemorrhage from a ruptured lower or, less commonly, upper aorta. The cause is unknown but some contributing factors such as the relatively high blood pressure of turkeys, their natural susceptibility to atherosclerosis, and the absence of an intramural vasa vasorum (intrinsic vascularization of the artery) in the lower aorta, might all play a role in the pathogenesis. The carcass is typically in good body condition but pale. Blood may be seen in the mouth or nostrils. A large amount of clotted blood is found in the body cavity, surrounding the kidneys [Fig. 1; Aortic rupture; NCSU] or filling the entire body cavity if rupture occurs in the lower aorta, or surrounding the heart if it occurs in the upper aorta. Careful examination will reveal a longitudinal tear in the wall of the aorta. Management procedures to decrease the incidence of this condition consist of avoiding excitement in the birds.

II. Dilated Cardiomyopathy of Turkeys (Round Heart Disease)

This condition causes mortality in turkey poults between 1 and 4 weeks of age and is a common occasional finding in commercial turkey flock. Affected poults are found dead with a severe bilateral dilated cardiomyopathy [Fig. 1; Round heart disease; NCSU], [Fig. 2; Round heart disease; UC Davis] often accompanied by secondary ascites and hydropericardium [Fig. 3; Round heart disease; NCSU], and congestion of other organs. If the poult survives with this cardiac disorder, growth will stop and the bird will soon show ruffled feathers, unwillingness to move, respiratory distress, and death. Microscopic changes in the myocardium are nonspecific. The etiology is unknown, but several factors such as genetic factors, early viral myocarditis and hypoxic conditions during incubation have been suggested.

III. Sudden Death Syndrome of Turkeys (Perirenal Hemorrhage)

DEFINITION

Sudden death syndrome of turkeys (SDS) or perirenal hemorrhage syndrome causes death in heavy-turkey flocks, particularly during grow-out period. Turkeys in good body condition, mainly males, die suddenly with postmortem lesions of acute generalized passive congestion.

OCCURRENCE

SDS is the main cause of mortality in fast-growing turkeys 8-15 weeks of age, but has been reported in turkeys older than 20 weeks of age. This syndrome is uncommon in female turkeys.

HISTORICAL INFORMATION

The condition was first reported in 1973 under the name sporadic renal hemorrhage. The disease has also been named perirenal hemorrhage syndrome, acute hypertensive angiopathy, or sudden death with perirenal hemorrhage. These confusing terms that describe lesions but give no indication of etiology and pathogenesis likely refer to the same condition.
ETIOLOGY

Through intense genetic selection and high-energy diets, the industry has developed a rapidly growing, heavily muscled turkey. SDS of turkey occurs during a period of fast growth and often follows exposure to stress or increased activity level in the flock.

Experimental studies have demonstrated the inability of the cardiovascular system of the domestic turkey to meet metabolic needs generated by exercise; within minutes, turkeys develop hypotension combined with severe lactic acidosis. Turkeys dying of SDS also show greater ventricular weights and cardiac changes described as concentric left ventricular hypertrophy.

It has been hypothesized that a certain percentage of the turkey population has concentric left ventricular hypertrophy which reduces myocardial blood flow and impairs coronary vascular reserve. Exercise or stress could therefore prompt acute myocardial ischemia triggering ventricular arrhythmias and terminal ventricular fibrillation. Ventricular arrhythmias could also be precipitated by the severe lactic acidosis developing during exercise subsequent to tissue hypoxia. Thus, an inadequate cardiovascular response of the turkey to stress or exercise may create hemodynamic instability leading to sudden death.

CLINICAL SIGNS

There are no clinical signs, except violent agonal wing flapping preceding death.

LESIONS

Turkeys dying of SDS are in good body condition with the digestive tract filled with ingesta, demonstrating the suddenness of death. Lesions are indicative of an acute generalized passive congestion with subcutaneous varicoses, pulmonary congestion and edema, perirenal hemorrhage [Fig. 1; Sudden Death Syndrome; NCSU], a swollen severely congested spleen, and congestion of other organs.

Perirenal hemorrhage has been reported to occur in other conditions and is not pathognomonic of the so-called SDS of turkeys. Birds possess a renal portal system with a superficial peritubular capillary plexus at the periphery of the renal lobule. Local passive congestion would therefore result in pooling of blood in the perirenal area and possible diapedesis, explaining the hemorrhages observed at the surface of the kidneys.

DIAGNOSIS

Lesions are diagnostic. Aortic aneurysm affects the same-age turkey, but in aortic aneurysm, birds are pale and free blood is present in the body cavity of the turkey.

CONTROL

Avoid excitement in the flock.

TREATMENT

There is no treatment.