

# Traumatic Ventriculitis and Encapsulation of Foreign Body in a Native Duck

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**Abstract:** *The ventriculus or gizzard is the muscular stomach of poultry and is functionally considered to replace the teeth in terms of digestion. Also known as gastric mill, and gigerium, a muscular thick-walled part of a bird's stomach for grinding food, typically with grit is the pacemaker of gut motility. It is made up mostly of two smooth muscle bands (thick and thin) that are oriented in different directions to create a powerful crushing action when they contract and lined with tough protein cuticle (koilin) that resists enzymes and acids secreted by the proventriculus. Traumatic ventriculitis or hardware disease is the perforation and or ulcerative erosions of the horny lining of the gizzard caused by foreign bodies. Birds with traumatic ventriculitis have been reported to die of either extreme emaciation or from toxemia. This article describes observations of the first report of a typical case in a native duck breed (Chara) that survived traumatic ventriculitis due to encapsulation of the causative agent.*

**Keywords:** Chara Duck, traumatic ventriculitis

## 1. Introduction

The gizzard or ventriculus in birds is susceptible to mechanical damage or traumatic injuries referred to as traumatic ventriculitis or hardware disease when subjected to the causative agents. Traumatic ventriculitis can hardly be detected and managed clinically. Nails of various sizes, bolts and nuts, sharp objects like pieces of wood, palm kernel shells and wires of various sizes are the major causes of traumatic ventriculitis (Musa et al 2011, Schlegel and Brash, 2015). In order to protect the muscles of the gizzard, the organ has a multi-layered membrane - or gastric cuticle - made of koilin, a carbohydrate-protein complex to protect the muscles. The thickness of this membrane varies with the types of food the bird eats, with diets heavier in grains, seeds, and insects creating thicker membranes than those consisting of fruits, worms, meat, and other softer edibles. (King, A. S., and McLelland, J. (1984), Akester, A. R. (1986). The gizzard usually contracts powerfully and rhythmically (2 - 4 times every minute) thereby reducing the contents to a thick pasty mass. Metallic or hard sharp foreign bodies may be taken in and reach the gizzard without causing any major problem and may continue to exist normally with grits in the gizzard or the strong acidic condition of the gizzard (pH 2 - 3) may react with the metallic objects resulting into wearing off or chemical damage of its surfaces (Kamil et al, 2008). Also the gizzard is capable of exerting considerable pressure on the objects taken in for maceration, that makes the gizzard quite susceptible to traumatic injuries with especially sharp hard objects.

A case of traumatic ventriculitis followed by encapsulation of foreign body in a native breed of female duck is mentioned here.

## 2. Materials and methods

2.1 A native breed of female duck aged one year died suddenly after showing signs of reduced feed intake.

## 2.2 Post mortem examination

Post mortem examination was conducted at the farm premises itself, as few more ducks were also dead along with this duck

## 2.3 Histopathological study

The gizzard along with the foreign body was fixed in 10% formalin. Histopathological examination using H&E stain was done at Avian Disease Diagnostic Laboratory, Thiruvalla, Pathanamthitta, Kerala, India

## 3. Results

### 3.1 Post mortem examination

Post mortem examination revealed catarrhal inflammation of the intestine and subsequent dehydration. The crop contained moderate quantity of feed. The oesophagus and proventriculus appeared normal grossly. The ovary contained mature ova, which indicated a healthy physiological activity. Gross examination of the surface of gizzard revealed a longitudinal projection of about 0.5 cm length and 0.5 cm diameter at the postero-ventral aspect of its circumference. (Fig 1) A linear incision was put along the border of the gizzard starting from the projection which revealed a hard material inside, completely covered with necrotic tissue. (Fig 2). The necrotic tissue around the material was removed and it was identified as a metallic pin of 3 cm length. (Fig 3) A transverse incision placed along the area also revealed a circumscribed lesion that was formed as a result of tissue irritation by the foreign body (Fig 4).

### 3.2 Histopathological study

Histopathological study revealed extensive fibrous tissue proliferation of muscularis mucosa, foci of necrosis with eosinophilic and heterophilic infiltration, inflammatory oedema with presence of bacterial colonies in necrotic foci. (Fig 5)

#### 4. Discussion

Traumatic ventriculitis due to different types of foreign bodies has been reported in many bird species, but appears to be more common in commercial poultry maintained on deep litter system particularly where litter materials are made up of wood shavings commonly collected from carpentry workshops (Du et al 2022, Musa et al., 2009). Birds with traumatic ventriculitis have been reported to die of either extreme emaciation or from toxaemia (Awadhiya et al, 1975). In the present report the ducks were under semi intensive system of rearing with free access to grass, commercial feed and water. Actual source of metallic foreign body in this case is unknown. The strong acidic condition of the gizzard had not made any wearing off or chemical damage of its surfaces.

#### 5. Conclusion

Traumatic ventriculitis in a native breed of duck is reported here. As per available literatures ducks developing traumatic ventriculitis subsequently die of extreme emaciation and toxaemia. In the present study, the metallic foreign body was recovered from the gizzard musculature near the postero-ventral aspect in an encapsulated condition without causing any difficulty to its mechanical activities. Appearance of a healthy gizzard musculature and presence of mature ova inside the abdominal cavity reveals that the duck was healthy until the time of death which was due to enteritis and subsequent dehydration

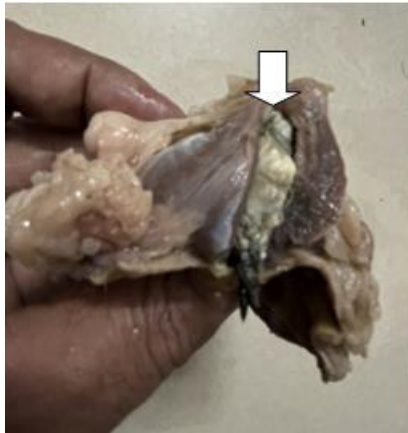


Figure 1



Figure 2



Figure 3

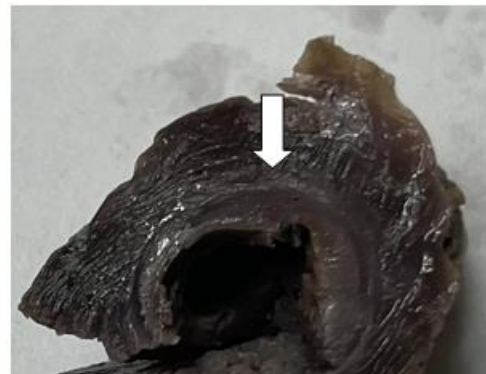


Figure 4

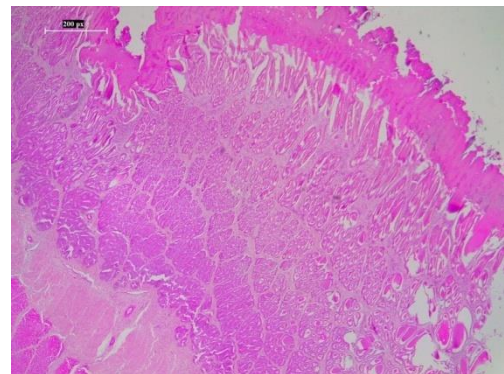


Figure 5

#### Acknowledgement

The author is extremely thankful to Dr A Kowsigan, Director of Animal Husbandry, Government of Kerala, for kindly giving the consent to publish this article.

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