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## Hepatic hydatid cysts in sheep and visualization of hydatid elements

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### Abstract

The common species causing Echinococcosis, hydatidosis or hydatid disease is *Echinococcus granulosus*. This present study reports on the microscopic studies of the hepatic hydatid cysts found in sheep which generally consists of outer lamellar layer, inner germinal layer, brood capsules, hydatid fluid and hydatid sand. In this study the cysts were found to be fertile. The viability test using Eosin stain concluded that the protoscolices were dead. Further in Borax carmine staining the hydatid sand appeared light pink in colour. However in both of the above staining method the hooklets remained refractory without taking any stain. This study mainly emphasizes on the microscopic examination and staining of the hydatid elements.

**Keywords:** Hydatid cyst, Liver, Sheep, Hydatid Elements

### 1. Introduction

Unilocular hydatid cyst, also known as hydatidosis, is a zoonotic disease caused by the cystic larval stage of the tapeworm *Echinococcus granulosus* (Yang *et al.*, 2005) [10]. Cystic echinococcosis in farm animals causes considerable economic problems due to loss of edible livers. In sheep and other herbivores the cysts can reach 4 cm in size. They contain watery fluid and material called hydatid sand, which looks like sand but consists of the young stages of the parasite. Old cysts can look like tuberculosis lesions or abscesses. The most common site for the cysts is the liver, less commonly brain, lungs and kidneys are affected. The heart and bone are uncommonly affected (Ghazani *et al.*, 2008) [5]. Specific diagnoses of hydatid cyst infections are mainly based on microscopic examinations of the cyst fluid and demonstrations of the presence of protoscolices, hooklets, or even when both are absent, fragments of the laminated membrane (Ascoli *et al.*, 1990) [11]. Significant losses of meat and milk production and fleece values from infected sheep may also occur. These losses are of special significance in countries with low economic outputs where sheep production is of particular importance (Torgerson *et al.*, 2001) [9].

### 2. Materials and Methods

Sheep liver having multiple hydatid cysts was collected during post mortem examination. The fluid from 2-3 cysts was aspirated by means of a sterile syringe and needle and transferred to a sterile centrifuse tube. The fluid was later centrifused and a drop of the sediment was examined under microscope. The fertility of the cyst was determined based on the presence of brood capsule and protoscolices in the cystic fluid. After examination, the cyst was found to be fertile. The viability of the protoscolices was determined by staining with 0.1% Eosin solution. Later the sediment was subjected for Borax carmine staining for better visibility. The gross specimen was preserved in 10% formalin.

### 3. Results

In general the common site for development of hydatid cyst in sheep is liver and lungs. In this study, the sheep liver harbored 10-12 cysts (Fig. 1). The cysts were colorless and light microscopic examination of the sediment obtained from cystic fluid revealed invaginated hydatid sand. In this study the cysts present on the liver were found fertile which was confirmed by the presence of brood capsules and protoscolices in the hydatid fluid. In viability examination, the live protoscolices didn't take stain immediately until 10 min where as dead ones took stain immediately. Borax carmine stained protoscolices appear light pink in colour (Fig. 2). However, hooklets were refractory to both Borax carmine and Eosin stain.

Different other stains like Ziehl-Neelsen, Trichrome stain, Ryan Stain and modified Baxby stain can be used for staining the hooklets whether isolated or inside the protoscolices (Clavel *et al.*, 1999)<sup>[2]</sup>.

#### 4. Discussion

Cystic hydatid disease is one of the most widespread and serious helminthic zoonotic infections in the world. Usually, livestock species are more susceptible to infection by contamination through the viable eggs of *E. granulosus* (Schantz *et al.*, 1997)<sup>[7]</sup>. The infection rate is generally high in liver of sheep because the bile duct in the liver receives the blood with the oncospheres after the blood has passed the duodenum (Soulsby, 1982)<sup>[8]</sup>. In this study the sheep liver collected contained multiple, colorless cysts on it which is in accordance to Ghazani *et al.*, (2008)<sup>[5]</sup>. The fluid collected from the cyst can be filtered or centrifused based on the amount of fluid collected.



**Fig 1:** Sheep liver showing hydatid cysts.



**Fig 2:** Borax carmine stained hydatid sand

In this case centrifugation method was followed. According to Elmajdoub *et al.*, (2015)<sup>[4]</sup>, the fertility of hepatic cysts in sheep is more than the pulmonary cyst. In our study also the cysts were found to be fertile. Our finding is in line with Kamhawi *et al.*, (1995)<sup>[6]</sup> and Dalimi *et al.*, (2002)<sup>[3]</sup>. The viability of the protoscolices was determined by using 0.1% Eosin stain and estimating the time taken by them to absorb the stain. In our present study, the protoscolices are found to be dead as they absorbed the stain immediately. The fertility and viability of the cysts play affect the role of intermediate hosts in infecting the definitive hosts and spreading the disease.

#### 5. Conclusion

In this study microscopic visualization of the hydatid elements was done.

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