Caseous Lymphadenitis in a Sheep - Postmortem and Histopathological Findings

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Abstract
An adult male sheep 4-5 years of age was presented for postmortem to the Department of Veterinary Pathology, FVSc & AH, SKUAST, Kashmir, from a local sheep farm. Postmortem examination revealed extensive abscessation of mediastinal lymph nodes containing thick caseous greenish-yellow pus. On the basis of histopathological nature of lesion, cultural characteristics and biochemical features of the isolated organisms, the disease was confirmed as caseous lymphadenitis.

Keywords: Caseous lymphadenitis, Sheep, Kashmir

Introduction
Caseous lymphadenitis is a bacterial disease of sheep and goat causing abscesses in lymph nodes of the body and internal organs, especially the lungs. The disease is caused by Corynbacterium pseudotuberculosis which is a very short, Gram positive rod that may appear coccoid on a slide preparation. A thick, flocculant, outer lipid layer makes the bacteria highly pyogenic and leads to thick-walled abscess formation. The disease is manifested by local inflammation at the site of entrance of bacteria and abscessation of both internal and external lymph nodes (Glen 2000). Sheep are more prone to internal abscesses and goats are more prone to external abscesses. Internal abscesses are detectable only at necropsy. Unfortunately, it is the internal abscesses that are fatal, whereas external abscesses are generally responsible for disease transmission (Ivanovic et. al. 2009).

An adult male sheep 4-5 years of age was presented for postmortem to the Department of Veterinary Pathology, FVSc & AH, SKUAST-Kashmir -India from a local sheep farm. The history revealed increased temperature, loss of appetite, lethargy and progressive emaciation. Standard necropsy procedure was followed and all the internal organs were screened for any
gross visible abnormality. On opening the thoracic cavity, mediastinal lymph nodes were highly enlarged. Enlarged lymph node was cut by sterile scissors and tissue specimens were collected and processed for histopathological examination by routine paraffin embedding technique. Lymph node contents were inoculated on blood agar base (Merck, Darmstadt, Germany) supplemented with 5% defibrinated sheep blood. After the incubation of plates aerobically for 48 h at 37°C, small, white, dry and crumbly colonies were searched for further identification. Pure cultures were prepared from the colonies that were Gram-positive and small curved rod-shaped in the microscopic examination. Then, routine biochemical tests, i.e. catalase, urease, trehalose, maltotriose and synergistic haemolysis with Rhodococcus equi and antagonistic haemolysis with Staphylococcus aureus (Cowan and Steel 1974) were carried out to identify the isolates. Grossly the lungs were congested and highly edematous. On careful examination extensive abscessation of mediastinal lymph nodes in between the lungs was noticed. Cut section of the abscess revealed a tough fibrous capsule filled with caseous, greenish-yellowish laminated purulent content without odor (Fig. 1).

![Fig. 1 - Cut section of mediastinal lymph node abscess showing tough fibrous capsule filled with caseous, greenish-yellowish laminated purulent content.](image)

On histopathological examination the abscess was characterized by central caseo-necrotic core surrounded by pyogenic membrane with infiltration of polymorphonuclear cells and few mononuclear cells and macrophages (Fig. 2). Histopathological examination of the respective lung parenchyma revealed severe vascular engorgement involving alveolar capillaries and peribronchial vessels. At places proteinaceous transudate staining pink with eosin was observed
in interalveolar septae and filling the alveolar lumen. The gross and histopathological features observed in the present study were similar to the findings of Peel et al (1997) and Williamson (2001).

Increased concentration of acid and neutral mucopolysaccharides in and around the abscess was a prominent feature (Fig. 3) which might be attributed to their probable role in the inflammation (Darzi et al., 2003 and Shah 2008).

**Fig. 2** - Section of abscess revealing central caseo-necrotic core (3) surrounded by pyogenic membrane (2) and fibrous capsule (1) with infiltration of polymorphonuclear cells, few mononuclear cells and macrophages. H & E x100.

**Fig. 3** - Section showing increased concentration of both acid and neutral mucopolysaccharides in and around the abscess. Combined Alcian Blue PAS. X300.
According to morphological, cultural properties and biochemical activity, isolated organisms were identified as *Corynebacterium pseudotuberculosis*. Smears from the pure cultures revealed Gram positive cocobacilli with metachromatic granules (Figure 4). The organism gave positive reaction on glucose, arabinose, fructose, mannose, maltose, sucrose, urease and methyl red. Reaction was negative on xylose, rhamnose, lactose, trehalose, raffinose and salicin. Esculin was not hydrolyzed. Nitrate was not reduced. These findings were in accordance with cites of Holt (1994) and Quinn (2002).

![Fig. 4 - Smear showing Gram positive cocobacilli](image)

In the present case the abscessation of mediastinal lymph nodes of lungs was the only observation. Ivanovic et al., (2009) and Estevao et al., (2007) have also reported that abscessation of internal organs (Visceral form) especially lungs is most common feature of caseous lymphadenitis in sheep while as disease in goats is mostly exhibited by abscessation superficial lymph nodes.

To the authors best knowledge this is the first report of Caseous Lymphadenitis from Kashmir Valley indicating that the disease might be prevalent in this region. Hence more extensive study should be undertaken for screening and monitoring this disease to reduce overall productivity of the herds.

**References**


