

Short Communications

Rhinitis due to actinobacillosis in a UK suckler cow herd

M. Wessels, D. Harwood, D. Welchman, A. Isaacs

ACTINOBACILLOSIS is a well-recognised clinical entity in cattle caused by *Actinobacillus lignieresii*, manifesting as a chronic pyogranulomatous inflammatory condition usually involving the tongue (wooden tongue), skin (cutaneous form), regional lymph nodes and less frequently the oesophagus, rumen and reticulum (Ryecroft and Garside 2000, Milne and others 2001, Brown and others 2007). It has been rarely recorded as a postoperative complication of caesarean section (de Kruif and others 1992). There are a small number of reports of respiratory-tract involvement including the nares, the nasal cavity, nasopharynx, trachea and lungs (Gorrie 1961, Carbonell 1976, Bertone and Rebhun 1984, Rebhun and others 1988, Brown and others 2007, Angelo and others 2009). This short communication describes a small outbreak of actinobacillosis in adult suckler cows presenting primarily with respiratory signs in the UK.

The herd was an organic 100 cow beef suckler unit of Stabiliser and Stabiliser cross cows with a conventional system of management. The first cases were seen in July and September 2010 involving two adult cows. In January/February 2011, a third cow and a bulling heifer were similarly affected.

Clinical signs in order of appearance were stertorous respiratory noise, nasal discharge (blood, pus and/or clear mucus), excess salivation, parotid lymph node swelling, submandibular oedema, clear ocular discharge, tongue rolling and excessive licking, self-trauma and ulceration of the nasal planum, weight loss and rapid reduction in milk yield. Response to treatment with non-steroidal anti-inflammatory drugs (flunixin meglumine, Finadyne; MSD Animal Health) and antibiotics (oxytetracycline, Engemycin 10 per cent; MSD Animal Health) led to clinical resolution over five to 10 days but all animals relapsed two to three months later with increasing severity of clinical signs. To investigate this problem further, two cows showing typical signs were culled for postmortem examination.

Both cows (arbitrarily identified A and B) were in fair to good body condition weighing 390 kg and 434 kg, respectively. Gross lesions in cow A were restricted to the nasal planum, nose and sinuses. Several ulcerative foci up to 3.5 cm in diameter were present

on the nasal planum and around the nares. Bilaterally in the nasal cavities, there was variable moderate to marked, firm, mottled grey/pink thickening of the turbinate mucosa often leading to occlusion of the nasal passages (Fig 1). Multifocal, small, similar mucosal nodules were present in the anterior nasal cavity. Large quantities of clear mucus were present posterior to the partly occluded airways and within frontal and maxillary sinuses.

Cow B had lesions typical of 'wooden tongue' with a swollen, firm tongue containing multifocal small pale foci and sublingual oedema. A firm dense fibrous connective tissue mass filled the submandibular space and the associated lymph nodes were firm, enlarged and a mottled cream colour. No changes were seen within the nasal cavities.

Representative portions of the nasal turbinate, lymph node and nasal planum from cow A, and tongue and submandibular tissue from cow B were fixed in 10 per cent neutral buffered formalin and routinely processed for histological examination. Routine culture of the nasal cavities of cow A yielded a relatively pure growth of *Pasteurella multocida*. A mixed growth including *Bibersteinia trehalosi* was isolated from the submandibular mass of cow B.

Histologically, the turbinate mucosa of cow A was markedly expanded and effaced by fibrosis and multifocal to coalescing pyogranulomatous foci containing radiating club-shaped eosinophilic material (Splendore-Hoeppli reaction) and Gram-negative coccobacilli (Fig 2). A similar pyogranulomatous lymphadenitis involving the parotid lymph node was present and lesions on the nasal planum consisted of a moderate ulcerative pyogranulomatous nodular dermatitis again with Splendore-Hoeppli reaction and coccobacilli. A pyogranulomatous glossitis and cellulitis was seen in cow B with similar bacterial colonies present.

Three of the four cattle had clinical signs of chronic rhinitis with only one having signs and lesions typical of 'wooden tongue' (B). Although nasal actinobacillosis was confirmed in cow A only, the clinical signs and response to treatment suggested a similar presumptive diagnosis in the remaining two cattle. Grossly, nasal lesions consisted of a proliferative rhinitis suggesting a number of differentials including atopic/allergic rhinitis, nasal schistosomiasis, nasal mycosis, *Pseudallescheria boydii* species complex and *Nocardia* species infection and nasal actinobacillosis/actinomycosis plus nasal tumour (eg, squamous-cell carcinoma, lymphoma (Gorrie 1961, Carbonell 1976, Shibahara and others 2001, Brown and others 2007, Singh and others 2007). Histological examination of the turbinates indicated lesions typical of actinobacillosis with bacterial morphology consistent with *Actinobacillus lignieresii*. Lymphogenous spread to the parotid lymph node and via nasal secretions to the nasal planum was thought to account for infection at these sites. Routine bacterial cultures failed

Veterinary Record

doi: 10.1136/vr.100806

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Provenance: not commissioned;
externally peer reviewed

Accepted March 13, 2012



FIG 1: Multiple transverse sections of the nasal cavity of a cow showing mucosal thickening

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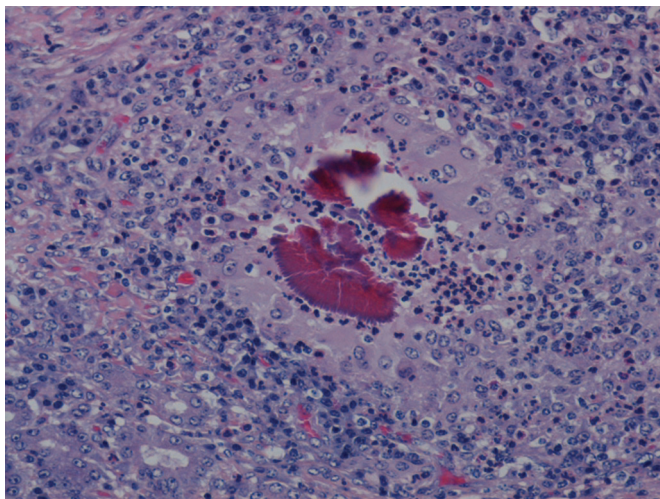


FIG 2: Nasal turbinate mucosa with pyogranulomatous reaction surrounding Splendore-Hoeppli reaction. Haematoxylin and eosin. x200

to isolate the organism from either cow but this may be the result of previous antibiotic therapy. The bacterial isolates obtained in both cases were felt to be commensals or secondary opportunistic pathogens only.

The nasal lesions in cow A are consistent with descriptions from Australia (Gorrie 1961, Carbonell 1976). These reports suggest this is a sporadic problem whereas this herd experienced a small outbreak. Why establishment of infection in the nasal cavity occurred in this case is unknown. The organism is a commensal of the oral cavity and pharynx of cattle and sheep and enters soft tissues via localised injury/abrasions leading to pyogranulomatous infection/inflammation. A primary mucosal insult (either infectious or traumatic) was not identified in this outbreak but previous infectious bovine rhinotracheitis (IBR) or other infective agent could not be ruled out as an initiator. Grazing pastures contained large numbers of thistles and these may be implicated in the oral infection but how they may have resulted in nasal infection is unknown. No evidence of plant material

was seen on gross or histological examination of the nasal mucosa. No conformational characteristics particular to this breed of cattle were thought to be a predisposing factor in acquiring infection.

Apart from IBR and malignant catarrhal fever, rhinitis in cattle in the UK is rare. Clinicians should consider nasal actinobacillosis as a differential diagnosis in chronic rhinitis among others but histopathology may be required to confirm infection entailing nasal mucosal biopsy or postmortem examination as bacteriology may be unrewarding.

Acknowledgements

The authors acknowledge the help of technical staff at AHVLA Winchester and Thirsk. The authors thank the farmer and the farm staff for their cooperation in this investigation. This work was carried out as part of scanning surveillance activities funded by Defra's food and farming group.

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Veterinary Record published online May 1, 2012

doi: 10.1136/vr.100806

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Published online May 1, 2012 in advance of the print journal.

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