INTESTINAL TUBERCULOSIS IN CROSS-BRED YOUNG CALF

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ABSTRACT

Intestinal tuberculosis in a young calf has been described. Lesions in other organs have also been recorded with illustrations. The possible pathogenesis has been discussed.

INTRODUCTION

TUBERCULOSIS in young calves is rarely reported. Recently, reports on the incidence of tuberculosis in young calves have been published by some workers[1–3], wherein lesions are described in lungs, trachea, brain and pulmonary, hepatic and mesentric lymphnodes. However, cases of intestinal tuberculosis in young calves below six months of age have not been reported in the literature so far.

MATERIALS AND METHODS

A carcass of a male calf (1067–A/82) aged 3 months and 3 weeks was autopsied. The calf had a clinical history of pneumonia, which on autopsy revealed lesions of tuberculosis in various organs. Tissues from these organs were collected in 10% formalin and processed for histopathological interpretation under haematoxylin and eosin. Ziehl-Neelsen's methods of staining was adopted for demonstration of acid fast bacilli in duplicate sections.

RESULTS

On autopsy, both the lungs were found to be affected with marked adhesions to the chest wall. Massive necrosis with varying sized multiple nodules containing caseated mass was observed in these areas. Pulmonary lymphnodes were enlarged, hard and caseated. An ulcerative focus (2 mm dia) was seen in the tracheal mucosa. Intestinal mucosa revealed mild ulcerations and thickening throughout the tract with slimy catarrhal contents. Serosal surface showed severe engorgement of blood vessels. Mesentric lymphnodes were nearly ten times enlarged as compared with the normal size, extensively hard and cord-like in appearance. Cut surfaces revealed a cheesy appearance. Smears prepared from the scrappings of the above organs revealed acid-fast bacilli indistinguishable from *Mycobacterium tuberculosis* on Ziehl-Neelsen's staining

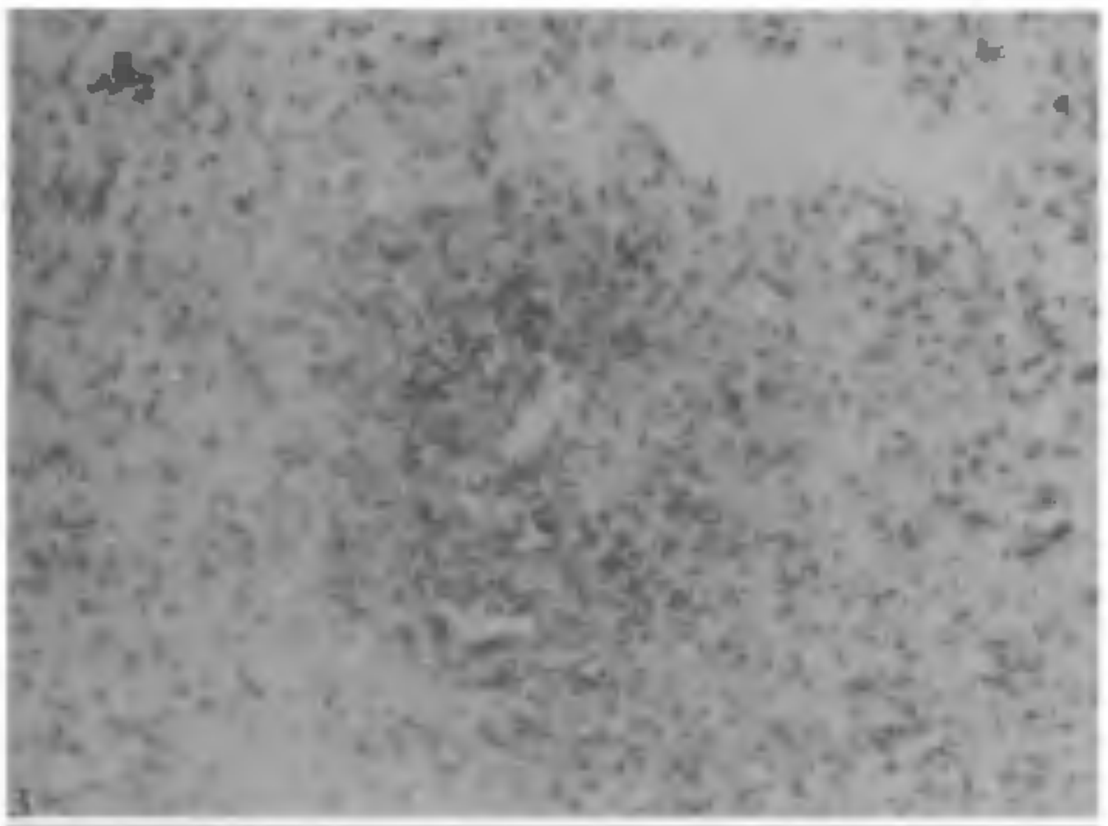
Microscopically, intestine revealed massive necrosis and sloughing of the villi. Tuberculous nodules were seen in the submucosa with central areas of caseation surrounded by a zone of mononuclears chiefly of lymphocytes and epitheloid cells (figure 1). There was neither calcification nor any giant cell formation. The intestinal thickening was more pronounced in the area of tubercle formation and was due to marked cellular proliferation.

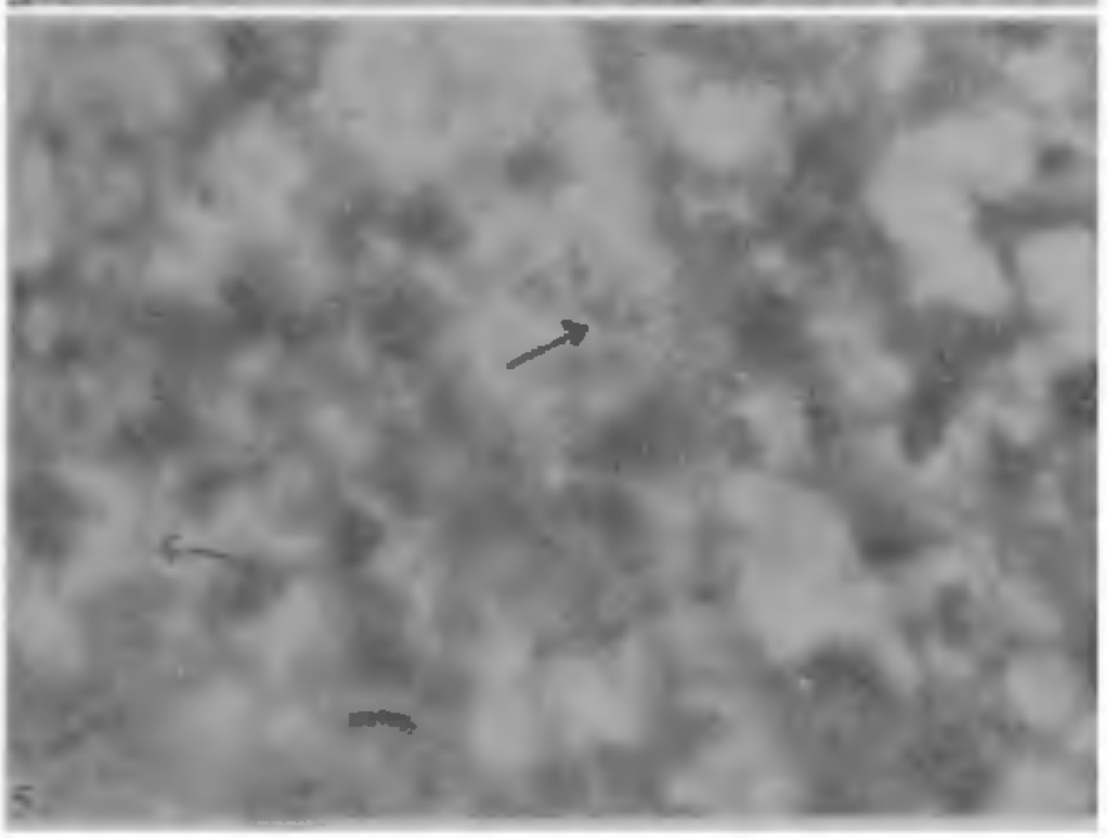
Mesentric and pulmonary lymphnodes revealed diffuse areas of caseation with fibrocellular reaction (figure 2). Occasionally Langhan's type of giant cells were also seen in the reactionary zone. At places islets of lymphocytes were present in the tissues. Lung revealed diffuse areas of caseation and tubercle formation without any evidence of calcification. Trachea had a lesion of nodular aggregation of mononuclear and epitheloid cells in the submucosa (figure 3). The overlying mucosa showed marked denudation. A teeming number of acid fast bacilli were demonstrated in these tissues by Ziehl-Neelsen's staining (figures 4–6), which were morphologically indistinguishable from bovine type of *M. tuberculosis*.

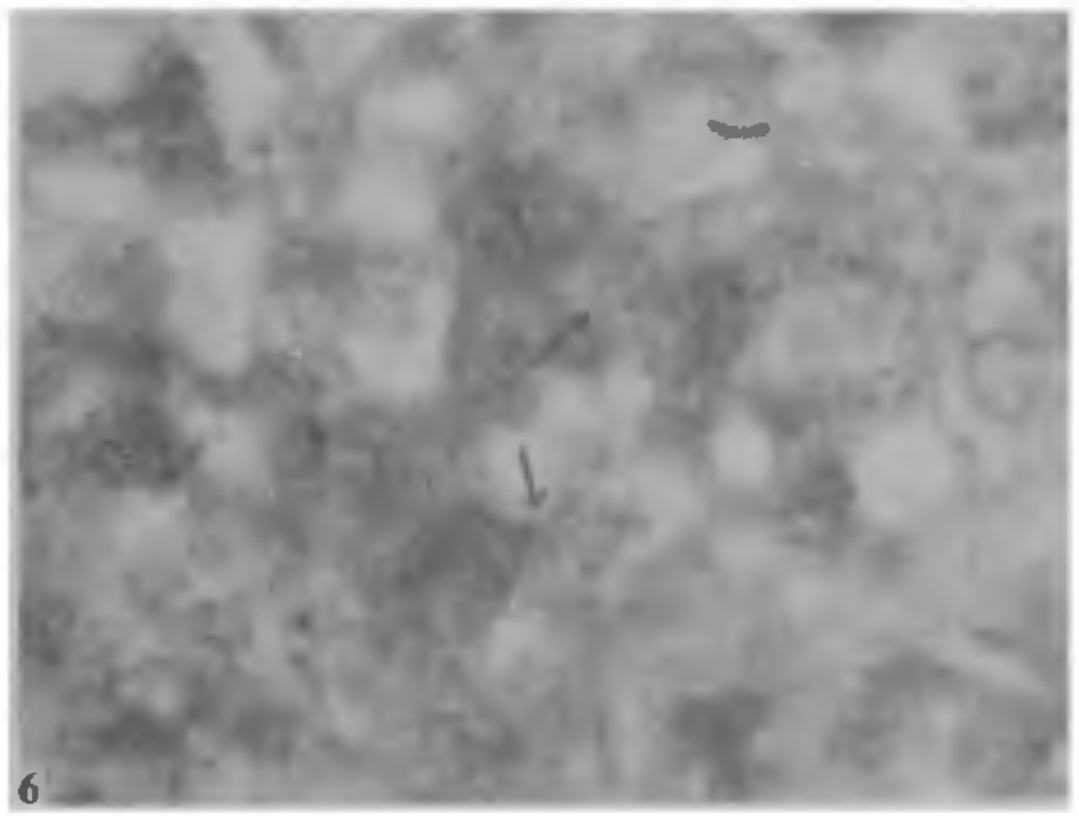
DISCUSSION

The incidence of tuberculosis in calves is not very rare. Although tuberculosis with affection of mediastinal, bronchial and hepatic lymphnodes, lungs, trachea and brain have been recorded in calves below six months[1,3–6], no published record could be traced on intestinal tuberculosis affecting young calves.

Singh *et al*[3] while describing tuberculosis in two young calves (6 and 8 weeks old) suggested the possibility of intrauterine infection, considering the spread, by hematogenous route. Roy[7] was of the opinion that calves may become infected with tuberculosis before birth, although it occurs very rarely.







Figures 1–6. 1. Tuberculous nodules in intestine showing central area of caseation, surrounded by zone of mononuclear and epitheloid cells. H.E. × 120. **2.** Mesentric lymphnode showing diffuse necrosis and fibrocellular reaction around. H.E. × 120. **3.** Trachea with nodular aggregation of mononuclear and epitheloid cells. H.E. × 90. **4.** Acid fast bacilli in the intestine. Z.N. × 2000. **5.** Acid fast bacilli in the lung. Z.N. × 1875. **6.** Acid fast bacilli in the trachea. Z.N. × 1875.

Mukherjee and Charan[1] while discussing the possible pathogenesis of tuberculosis in young calves, opined that in post-natal calf-hood, tuberculous infection originates from the feeding of contaminated milk containing tubercle bacilli, from contact of calves with open cases of tuberculosis and from the surroundings and animal attendants. In human beings two forms of intestinal tuberculosis are encountered. The first is primary intestinal tuberculosis, a rare form in which tubercle bacilli gain entrance into the body by way of the intestinal tract following ingestion of contaminated food. The second form is secondary intestinal tuberculosis which occurs as a consequence to the complications of pulmonary tuberculosis[8]. In the present case, the infection seems to be a primary intestinal tuberculosis, where it is presumed that the bacilli have gained entry into the body through contaminated milk. The diffuse ulcerative lesions of intestinal tract along with marked enlargement and caseation of the mesentric lymphnodes as described at the necropsy, speaks more in favour of the primary intestinal tuberculosis.

The incubation period of *M. tuberculosis* infection varies from 3–12 weeks[9]. Hence in the present case the chances of developing tuberculosis in post-natal calf-hood is justifiable. This particular animal might have become infected after weaning and by taking infected pooled milk, as is usually adopted as a package of practice at this farm.

The other possibility of infection by inhalation of contaminated dust from the surroundings cannot be ruled out considering the fact that some more animals or attendants might be harbouring the infection. As the overall incidence of tuberculosis in cattle in recent years appears to be increasing[10], immediate necessary steps (tuberculin testing, disinfection of sheds and proper sanitation measures) should be strictly followed to alleviate this chronic problem.

ACKNOWLEDGEMENTS

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NEWS

SHELTERED TREES GROW FASTER

This open-ended square section tube, designed to protect young broadleaved trees during their first year, is claimed to offer significant increases in growth, together with protection from the ravages of animals and the vagaries of the weather. The Somerford Sheltatree is of extruded poly-propylene, a translucent plastics corrugated in section, with an air space between inner and outer skins; it contains an ultra violet inhibitor, giving it an outdoor life of five years. The shelter, secured by special clip to a stake, initially totally encloses the young planted-out tree to provide a protected environment similar to that of a greenhouse. It is available in square or hexagonal form in heights from 1.2 m to 1.8 m. (*British Industrial News, No. 144, January 1984, p. 26*).