ACTINOMYCOSIS

Lumpy Jaw

Definition:

- It is a chronic infectious debilitating disease of cattle mainly, caused by *actinomyces bovis*, characterized by rarefying periostitis and formation of bony cavities filled with pus in head bones particularly the mandible and maxilla.

Etiology

- *Actinomyces bovis* is the primary cause

- *Actinomyces bovis* is common inhabitant (flora) of the mouth and digestive tract, Gram positive, grow in branching filaments (crushed preparation of sulfur granules from pus or tissues), coccoid, or filament rods have distinct cell walls.

- It is difficult to cultivate, required media contain serum or blood, incubate at 37^{o}C forming granular to smooth microcolonies.

Predisposing factors:

- *Actinomyces bovis* is a common inhabitant of the bovine mouth and infection is presumed to occur through
  - wounds to the buccal mucosa caused by sharp pieces of feed or foreign material.
  - Infection may also occur through dental alveoli, and may account for the more common occurrence of the disease in young cattle when the teeth are erupting.
  - Infection of the alimentary tract wall is probably related to laceration by sharp foreign bodies.

Epidemiology

- **Animal susceptible**: The disease is common in cattle. Occasional cases occur in pigs and horses and rarely in goats
- **Mode of infection:**
  - ***Source of infection***: Pus discharged from the lesions is the main source of infection to susceptible animals.
  - ***Mode of transmission:*** infection is presumed to occur through wounds or abrasions of buccal mucosa by sharp pieces of food or foreign agents or through dental alveoli.

Pathogenesis

- In the jawbones a rarefying osteomyelitis is produced.
- The lesion is characteristically granulomatous both in this site and where visceral involvement occurs.
- Involvement of the jaw causes interference with prehension and mastication.
- when the alimentary tract is involved there is physical interference with ruminal movement and digestion, both resulting in partial starvation.
- Rarely, localization occurs in other organs, caused apparently by hematogenous spread from these primary lesions.

Clinical signs

- Incubation period is unknown, morbidity rate is low, there is no mortality and the course of the disease is long (several months).
  - Actinomycosis of the jaw commences as a painless, bony swelling which appears on the mandible or maxilla, usually at the level of the central molar teeth.
  - lesions enlarge rapidly within a few weeks, others slowly over a period of months. The swellings are very hard, immovable and, in the later stages, painful to the touch. They usually break through the skin and discharge through one or more openings.
  - The discharge of pus is small in amount and consists of sticky, honey-like fluid containing minute, hard, yellow white granules (Sulfur granules). There is a tendency for the sinuses to heal and for fresh ones to develop periodically.

Clinical signs

- In severe cases, spread to contiguous soft tissues may be extensive and involve the muscles and fascia of the throat. Excessive swelling of the maxilla may cause dyspnea. Involvement of the local lymph nodes does not occur.
- The most common form of actinomycosis of soft tissues is involvement of the esophageal groove region, with spread to the lower esophagus and the anterior wall of the reticulum. The syndrome is one of impaired digestion.

- There is periodic diarrhea with the passage of undigested food material, chronic bloat.

Postmortem lesions

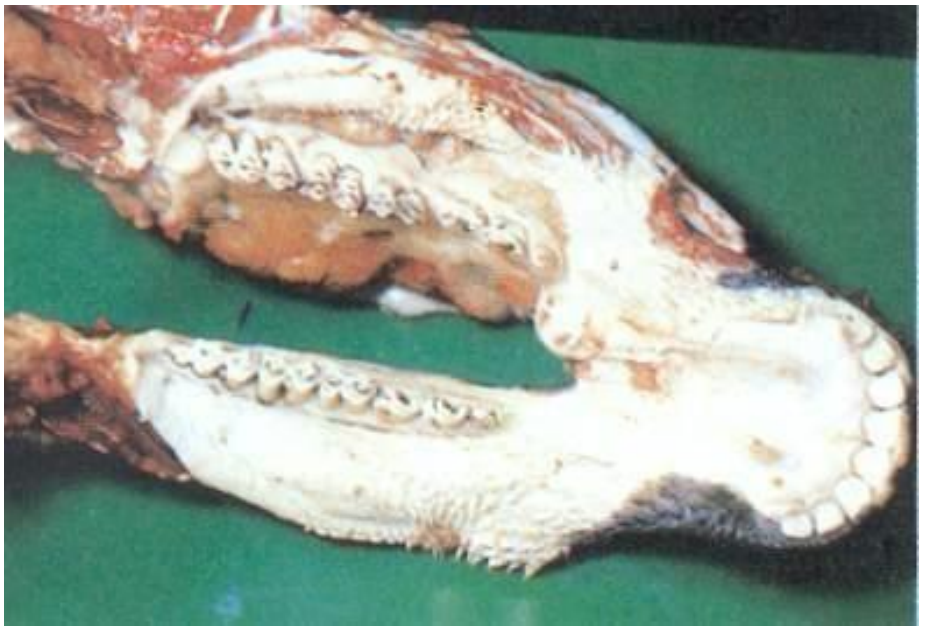
- Granulomatous lesions containing pockets of pus may be found in the esophageal groove, the lower esophagus and the anterior wall of the reticulum.

- Spread from these lesions may cause a chronic, local peritonitis.
- Involvement of local lymph nodes does not occur, irrespective of the site of the primary lesion.

cow afected with actinomycosis . large mass of osteoid and granulomatus growth at lower jew.

cow with actinomycosis . showing large mass of granulomatus and osteoid growth protroded skin

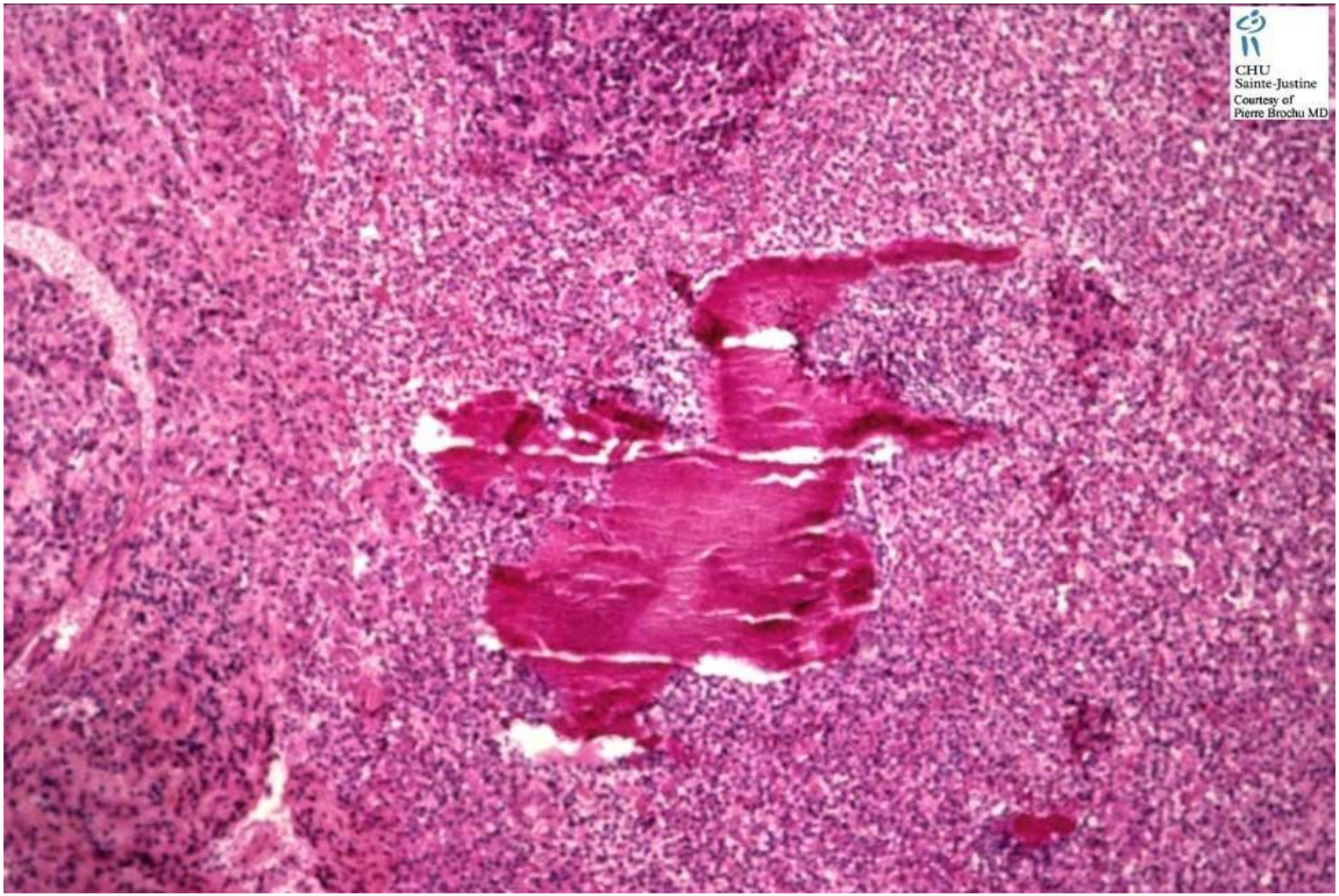
actinomycosis of upper jow . there is large mass of granulomatus and osteoid growth with multiple



bovine lower jew . showing large mass of osteoid growth with microabscesses and granulomatus lesion

actinomycosis . ostitis . bovine

actinomycosis . granulomatus growth with bone formation at center of lesion



Diagnosis

- **Field diagnosis**: It depends on history of feeding on sharp owns, chronic nature of the disease and signs of thickening lower edge of mandible.

Diagnosis

- **Laboratory diagnosis**
- **Samples**: Pus, smears from the bony lesions, blood and serum.

- **Laboratory procedures:**
  - Examination of smears prepared from pus or crushed sulfur granules (washing of granules in saline, granules placed on slide in a drop of saline, put cover slip and is crushed by gentle pressure) after staining by gram stain to detect gram positive rode forming slightly branched filaments (in the center of crushed granules).

  - Isolation and identification of the causative agent, by culture of pus on specific media, incubate at 37ºC, under increase of Co_2, colonies develop at 48 h or more, identification of the organism from colony morphology and biochemical reaction.

  - Histopathology to detect granulomatous reaction.

  - X-rays to see rarefying of bone due to severe periostitis with multifocal radiolucencies due to bone rarefaction.

Differential diagnosis

- It confused with:
- Abscesses of the cheek muscles and throat region

- Bony neoplasm, tooth root infection, bone fractures and bone sinusitis.

- Indigestion caused by visceral actinomycosis is confused with other causes of indigestion.

Control

- Isolation or disposal of animals with discharging lesions is important, although the disease does not spread readily
- predisposing environmental factors cause a high incidence of oral lacerations should be avoided.