MALIGNANT EDEMA, CLOSTRIDIAL MYONECROSIS, GAS GANGRENE

**ETIOLOGY**

Malignant edema is an acute wound infection associated with organisms of the genus Clostridium *. Clostridium septicum, C. chauvoei, C. perfringens, C. sordellii,* and *C. novyi* have all been isolated from lesions typical of malignant edema of animals. In some cases there can be mixed infections. *C. sordellii* has been associated chiefly with malignant edema of cattle but it has been found to be a cause of malignant edema and swelled head in sheep.

**Epidemiology**

 All ages and species of animals are susceptible. Sporadic disease affecting individual animals following injections but outbreaks following contamination of wounds produced by management procedures

**Source of infection**

 The infection is usually soil-borne, and the resistance of spores of the causative clostridia to environmental influence leads to persistence of the infection for long periods in a local area.

**Transmission and risk factors**

 In most cases a wound is the portal of entry.

1-Deep puncture wounds accompanied by severe trauma provide the most favorable conditions for growth of anaerobes.

2-Infection may occur through surgical or accidental; wounds following vaccination, intramuscular injection of drugs, or through the umbilical cord in the newborn.

3- Clostridial species can be found in the normal muscle of horses and may be activated by anaerobic conditions such as intramuscular injection of drugs, commonly in association with the treatment of colic, is the common precipitating factor.

4- In all species there is risk with the intramuscular injection of drugs such as anthelmintics and nutritional supplements, some of which can cause significant tissue damage at the site

5- Outbreaks can occur in sheep after management practices such as shearing, and docking, or following lambing.

6- in cattle following parturition, sometimes associated with lacerations of the vulva.

7- The disease 'swelled head', a form of malignant edema, occurs in young rams 6 months to2 years old when they are run in bands and fight among themselves.

**PATHOGEN ESIS**

Potent necrotoxins are produced in the local lesion and cause death when absorbed into the bloodstream. Locally the exotoxins cause extensive edema and necrosis followed by gangrene.

CLI NICAL FINDINGS

1-Clinical signs appear within 6-48 hours of infection.

2-a local lesion at the site of infection consisting of a soft,

 doughy swelling with marked local erythema accompanied by severe pain on palpation.

3- A later stage the swelling becomes tense and the skin dark and taut.

4- depending on the type of infection Emphysema with extensive frothy exudation from the wound may or may not be present. We can notice With *C. novyi* infections there is no emphysema.

5-A high fever (41-42°C) is

6-affected animals are depressed, weak and show muscle tremor and usually stiffness or lameness.

7-The mucosa are dry and congested

8- affected animals die within 24-48 hours of the first appearance of signs.

9-When infection occurs at parturition, swelling of the vulva accompanied by the discharge of a reddish-brown fluid occurs

within 2-3 days. The swelling extends to pelvic tissues and perineal region. The local lesions are accompanied by a profound toxemia and death occurs within 1-2 days.

10-In 'swelled head' of rams the edema is occurs first under the eyes and spreads to the subcutaneous tissues of the head and down the neck.

CLINICAL PATHOLOGY

1-Examination of a Gram-stained smear of aspirated fluid from edematous swellings or swabs from wounds will give an early diagnosis,

2-PCR

3-Bacteriology - fascial tissue, placed in an airtight container; four air-dried smears of fluid from lesion (anaerobic CULT, FAT)

°4- Histology - fixed sample of lesion.

**Differential diagnosis**

• Blackleg. The disease is differentiated from blackleg by the absence of typical muscle involvement and the presence of wounds

• Anthrax in pigs and horses

• Photosensitivity in white-faced sheep with swelled head

TREATM ENT

1-Specific treatment requires the administration of penicillin(high doses of crystalline penicillin intravenously, repeated at 4-6-hour intervals) or a broad-spectrum antibiotic.

2-Antitoxin aids in controlling the toxemia must be given very early in the course of the disease.

3-A nonsteroidal anti-inflammatory drug (NSAID)

4-supportive therapy are recommended.

5-Local treatment consists of surgical incision to provide drainage, and irrigation with hydrogen peroxide.

6-Injection of penicillin directly into and around the periphery of the lesions

CONTROL

1-Hygiene at lambing, shearing, castration and docking is essential to the control of the infection in sheep.

2-Vaccination with a clostridial bacterintoxoid