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Lecture title: Strangles

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Summary:

Synonyms: Strangles, Equine Distemper, Infectious Adenitis

مرض خناق الخيل او حصبة الخيول او التهاب الغدد المعدي في الخيول

Definition: Strangles is an acute, contagious disease of the equine, caused by *Streptococcus equi* subsp. *equi* and characterized by inflammation of the upper respiratory tract, Pyrexia, anorexia and abscessation of the regional lymph nodes**.**

History: The disease was first described in 1664

ETIOLOGY

Streptococcus equi subsp. *Equi*

- (*S. equi*) is a gram-positive coccobacillus that produces a beta-hemolysin, evident as a zone of clear hemolysis surrounding colonies growing on blood agar.
- The organism is resistant to disinfectants when in dried purulent exudate. It can survive for weeks in pus, soil, or bedding. Fresh exudate may easily be sterilized by 5% sodium hydroxide
- There is variation in virulence related to the amount of M protein and hyaluronic capsule and the production of a leukocidal toxin.

EPIDEMIOLOGY

Occurrence

- Strangles occurs in horses, ponies, donkeys, and mules worldwide, with the exception of Iceland.
- Outbreaks are seen relatively frequently on breeding farms and in polo and racing stables.
- Strangles can affect horses of any age.
  - Morbidity rate is usually greater in younger horses such as foals and weanlings.
  - The risk of occurrence of an outbreak of strangles increases with the size of the group of horses.
  - The case-fatality rate without treatment is about 9%, but with adequate early treatment, it may be as low as 1% to 2%.
  - Deaths are usually attributable to pneumonia.

Source of Infection and Transmission

- **Nasal and abscess discharge** from infected animals that contaminates pasture, tack, stalls, feed and water troughs, grooming equipment, and hands and clothes of grooms and veterinarians is often the source of infection for susceptible horses.
- All infections are attributable to transmission from infected horses, either directly or by fomites.
- Approximately 10% to 40% of horses that recover from the clinical disease have persistent infection of *S. equi* in the pharynx and guttural pouches for many months and are an important

Animal Risk Factors

- Strangles is more common in young or naïve horses,
- Animals that have previously had the disease are less likely than naive animals to develop the disease on subsequent exposure.
- Parts of horses (25%) that recover from the disease do not develop immune response and are susceptible to reinfection and a second attack of strangles.
- Resistance to the disease is associated with the production of serum and mucosal IgG antibodies to the streptococcal M protein.
- Antibodies after infection with *S. equi* are present in colostrum and milk of mares that have recovered from the disease, are passed to foals via the colostrum.

PATHOGENESIS:

I. *S. equi* adhesion to oral, nasal, and pharyngeal tissues.
II. Invasion of pharyngeal tonsils and associated lymphoid structures.
III. *S. equi*, bacteria lodge in the **pharyngeal and tonsillar lymphoid tissues,** where they multiply rapidly.
IV. Bacteremia may occur.
V. Migration of neutrophils into the lymph nodes causes swelling and abscessation within 48 hours of infection,
VI. Disruption of lymph drainage and development of edema in tissues drained by the affected nodes
VII. Metastatic infection of the heart valves, brain, eyes, joints, and tendon sheaths or other vital organs can occur and cause a chronic illness and eventual death.
VIII. Death is usually attributable to pneumonia caused by aspiration of infected material.
- Other causes of death include:
- Asphyxiation secondary to upper airway
- Swelling and impairment of organ function by metastatic infection.
- Deaths rare occur as a result of infarctive purpura hemorrhagica in horses.

CLINICAL FINDINGS

- The disease manifests as

i- **an acute** disease of varying severity
ii- **Chronic infection** of retropharyngeal lymph nodes and guttural pouches,
iii- **Chronic disease** associated with metastatic infection of organs distant to the upper respiratory tract.

- The term strangles derives from the enlarged retropharyngeal lymph nodes and guttural pouches causing respiratory distress in severely affected equids

Acute disease

- Mucopurulent nasal discharge
- Abscessation of submandibular and retropharyngeal lymph nodes.
- After incubation period of 1 to 3 weeks the disease develops suddenly,
- With complete anorexia, depression, fever (39.5– 40.5° C), a serous nasal discharge that rapidly becomes copious and purulent,
- A severe pharyngitis and laryngitis. (Rarely mild conjunctivitis).
- There is a soft, moist cough
- Lymphadenopathy becomes apparent as the submandibular lymph nodes enlarge and palpation elicits a painful response.
- The pharyngitis may be so severe that the animal is unable to swallow, and there is a soft, moist cough. The head may be extended.
- Swelling of the retropharyngeal lymph nodes can cause obstruction of the oro- and nasopharynx with subsequent respiratory distress and dysphagia.
- Affected node ruptures to discharge **thick cream-yellow pus.**
- Retropharyngeal abscesses can rupture into the guttural pouches, resulting in guttural pouch empyema and ultimately in prolonged infection and formation of chondroids.
- Average cases run a course of 3 weeks; severe cases can last as long as 3 months.
- In the severe infection, many other lymph nodes, including the pharyngeal, submaxillary, parotid, and retrobulbar nodes, can abscess at the same time
    - Local abscesses also occur at any point on the body surface, particularly on the face and limbs.

Complications

Complications occur in about 20% of cases.

1- The most common fatal complication ⟹ development of **suppurative necrotic bronchopneumonia,**
2- Guttural pouches infection ⟹ rupture of retropharyngeal lymph nodes into the medial compartment, ⟹ **causes empyema** and formation of **chondroids**

3- The **recurrent laryngeal nerves**, can impair the function of with subsequent unilateral or bilateral laryngeal paresis and respiratory distress. which result from Retropharyngeal lymphadenopathy .

4- Metastatic infection（**"bastard strangles"**）

- Results in the formation of abscesses in any organ or body site but most commonly in the lungs, mesenteric lymph nodes, liver, spleen, kidneys, and brain.
- Sudden death as a result of rupture of abscesses into a body cavity.
- Suppurative meningitis characterized clinically by excitation, hyperesthesia, rigidity of the neck, and terminal paralysis when Extension of infection to the meninges occurs.

- Abscesses in the brain cause a variety of clinical signs, depending on location of the abscess, including severe depression, head pressing, abnormal gait, circling, and seizures.
- **Purpura hemorrhagica** can occur as a sequela to *S. equi* infection.
- Purpura hemorrhagica including infarctions in the gastrointestinal tract, skin, and lungs, Muscle infarction.(Rhabdomyolysis and muscle atrophy)

CLINICAL PATHOLOGY

- Hematologic abnormalities during the acute phase of the disease include leukocytosis,with a neutrophilia reaching a peak as the lymph nodes abscess
- Hyperfibrinogenemia is characteristic of both the acute and chronic disease.
- Leukocytosis with a hyperproteinemia, Hypoalbuminemia
- measured the serum IgG antibody titer to SeM
- PCR testing of nasopharyngeal swabs or guttural pouch lavage fluid to detect shedding of *S. equi* DNA
- Culture of nasal, pharyngeal, guttural pouch, or abscess discharge will usually yield S. equi

NECROPSY FINDINGS

- Suppuration in internal organs, especially the liver, spleen, lungs, pleura, and peritoneum.

Diagnosis:

•***clinical signs***.
•Nasopharyngeal swab for confirmation of the disease, this is taken from the throat by passing the swab up the horse's nose.

- blood test from your horse which can help to identify not only infected horses but also carriers and those that have previously been exposed.
- guttural pouch endoscopy, during which the inside of the guttural pouch can be visualized and samples can be taken for testing(bacterial isolation and identification).

Treatment:

1. penicillin-streptomycin 10000 I.U/Kg. B.W for 3-5 days i.m
2. sulfadimidine 150-200mg/kg. B.W. for 3-5 days i.v or s.c
3. Supportive care.
   - Analgesic-anti-inflammatory medication in order to treat the raised temperature and make horses feel well enough to eat.
   - Hot compressing of the abscesses will also help to bring them to the surface, allowing them to rupture.
4. Surgical treatment of abscessed L.N may require.

Control and Prevention:

- Good yard management include: → isolation of infected animal
  → Disinfectant of stable and instruments.

- Vaccination program.