**Diseases of the pleura and diaphragm**

**Pleuritis (Pleurisy)**

Pleuritis refers to inflammation of the parietal and visceral pleura. Inflammation of the pleura almost always results in accumulation of fluid in the pleural space. It is characterized by varying degrees of toxemia, painful shallow breathing, pleural friction sounds and dull areas on acoustic percussion of the thorax because of pleural effusion.

**Etiology and Classification**

* **Primary pleuritis**: Rare broken rib due to penetration or perforation of the pleural space usually traumatic of the thoracic wall and subsequent infection .

A- Traumatic perforation of the thoracic wall primary pleurisy.

B-Perforation of diaphragm by sharp foreign body.

C- Primary peritonitis spread of infections infected pleurisy.

E- Complication of traumatic pericarditis.

F- Rupture of esophagus due to severe obstruction.

* **Secondary pleuritis**: As a part of specific infectious disease ,T.B. or toxic agent.

A- In the course of some specific disease contagious bovine pleuropneumonia, pleuropneumonia of sheep & goats, pneumonia by caused by P. multocida & T.B in cattle & infect. Equine pneumonia & Strangles of horse.

B- It is permanent lesion in contagious pleuropneuomomia.

C- Extension of infection from the lung.

**Pathogenesis**:

1-**In the early and acute stage** of pleurisy Contact and movement between the parietal and visceral pleura causes pain due to stimulation of pain end organs in the pleura..

Respiratory movements are restricted and the respiration is rapid and shallow.

2- **The second stage** of pleurisy is production of serofibrinous inflammatory exudate, which collects in the pleural cavities and causes collapse of the ventral parts of the lungs, thus reducing vital capacity and interfering with gaseous exchange.

If the accumulation is sufficiently severe there may be pressure on the atria and a diminished return of blood to the heart.

Clinical signs may be restricted to one side of the chest in all species with an imperforate mediastinum.

3- **In the third stage** the fluid is resorbed and adhesions develop, restricting movement of the lungs and chest wall but interference with respiratory exchange is usually minor and disappears gradually as the adhesions stretch with continuous movement. The toxemia may be severe when large amounts of pus accumulate.

**Clinical finding:** There are 3 stages of pleurisy:

**A- Dry stage:**

Auscultation , frictional sound.

Percussion , dull sound.

**B- Exudative stage:**

The fluid is accumulated in the ventral part of sac line of demarcation or pleuritic line which is horizontal line on percussion on the line , dull sound& on auscultation above the line , normal, vesicular sound. & below the line absence of sound because of exudates.

**C- Adherent stage**:

On percussion , dull sound.

On auscultation , frictional sound.

* The clinical findings of pleuritis vary from mild to severe. depending on the species and the nature and severity of the inflammation.
* In peracute to acute stages of pleuropneumonia in horse commone finding are fever, toxemia, tachycardia, anorexia, depression, nasal discharge, coughing, exercise intolerance, breathing distress, and flared nostrils.
* The nasal discharge depends on the presence or absence of pneumonia. It may be absent or copious and its nature may vary from mucohemorrhagic to mucopurulent.
* **Pleural pain (pleurodynia) is common and manifested as pawing, stiff forelimb gait, abducted elbows and reluctance to move or lie down. Horse with pleural pain often reluctant to cough .**
* In the early stages of pleuritis, breathing is rapid and shallow, markedly abdominal and movement of the thoracic wall is restricted.
* **The application of hand pressure on the thoracic wall and deep digital palpation of intercostals spaces usually causes pain manifested by a grunt, a spasm of the intercostals muscles or an escape maneuver.**
* **Pleuritic friction sounds may be audible over the thoracic wall. When the pleuritis involves the pleural surface of the pericardial sac a friction rub may be heard with each cardiac cycle and be confused with the friction sound of pericarditis.**
* **Subcutaneous edema of the ventral body,wall extending from the pectorals to the prepubic area is common in horses with advance pleurisy** .
* When pleura effusion dullness on acoustic percussion over the fluid -filled area of the thorax is characteristic of pleuritis in which there is a significant amount of pleural effusion.

**Clinical pathology:**

**A-Thoracocentesis (pleurocentesis)** :

The fluid is examined for its odor, color and viscosity, protein concentration and presence of blood or tumor cells, and is cultured for bacteria. It is important to determine whether the fluid is an exudate or a transudate.

**B-Pleuroscopy**

**C-Heamatology:**

leukopenia and neutropenia with toxic neutrophils are common in peracute bacterial pleuropneumonia in horses and cattle.

**In acute pleuritis** with severe toxemia, hemoconcentration, neutropenia with a left shift and toxic neutrophils are common.

**In subacute and chronic stages** normal to high leukocyte counts are often present. Hyperfibrinogenemia, decreased albumin-globulin ratio and anemia are common in chronic pleuropneumonia.

**D-Ultrasonography**

is more reliable to detection of pleural fluid in horse than radiography .

**Necropsy finding:**

In early acute pleurisy there is marked edema, thickening and hyperemia of the pleura, with engorgement of small vessels and the presence of tags and shreds of fibrin.

In the exudative stage the pleural cavity contains an excessive quantity of turbid fluid containing flakes and clots of fibrin. The pleura is thickened and the central parts of the lung are collapsed and dark red in color.

**Differential diagnosis:**

* Pneumonia
* Pulmonary emphysema
* Hydrothorax and hemothorax
* Pulmonary congestion and edema
* Pulmonary abscess

**Treatment :**

The prognosis depended on the severity and extent of pleuritis and the presence of pneumonia

1. Antimicrobial therapy selected on basis of culture and sensivity or broad spectrum antibiotics
2. Drainage and lavage of pleural cavity
3. Thoracotomy

**Diaphragmatic Hernia**

Diaphragmatic hernia is rare in farm animals except in cattle especially in association with traumatic reticulo-peritonitis, here the hernia is small &not cause any respiratory disturbance except there is abnormal sound on chest. Occasional hernia can be occurred by foreign body. Congenital hernia is recommended in all spp.

**Clinical findings:**

* Colic & dyspnea in horse.
* Presence of intestinal sound in the thorax.
* There may be a small fold projection from the chest wall.

**Treatment:** surgically.