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Degenerative Joint Disease

Definition

Degenerative Joint Disease is the progressive degenerative of the articular cartilage of a synovial joint and happens in 3 stages.

-  **Synovitis** - Inflammation of the synovium
-  **Arthritis** - Inflammation of the joint
-  **Osteo- Arthritis** - Inflammation of the bone

Anatomy

The Anatomical Structures involved with DJD are

-  Capsular Ligament
 - Outer Fibrous Layer
 - Inner Synovial layer
-  Synovial Fluid
-  Articular Cartilage

Articular cartilage

Articular cartilage covers the articular surfaces of the two bones within the joint. They have a smooth soft consistency which reduces friction, absorbs concussion and withstand compression. The cartilage cannot regenerate if damaged.

Progression of DID

The 3 stages of DJD are Synovitis, Arthritis & osteoarthritis

Synovitis

This is the first stage of DJD is the inflammation of the synovium, inflammatory substances are released into the joint cavity by damaged cells in the tissue causing pain, heat and swelling

Articular Cartilage is made up of **collagen fibres, complex proteoglycan** molecule & **Water**. With DJD the Proteoglycans are damaged causing loss of function and more damage. The inflamed synovial layer of the Capsular ligament releases Enzymes which causing more inflammation and degrade the articular cartilage. **This loop then continues,**

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This inflammation stretches the capsular ligament which in turn increases synovial production. (An increase in fluid production is called **joint effusion**) When the Enzymes are released into the joint cavity they change the viscosity of the of the synovial fluid making it thinner removing some of its lubricating properties.

There are a number of enzymes produced by inflamed synovial membrane that are considered important:

- + neutral metalloproteinases
- + serine proteinases
- + cysteine proteinases
- + aspartic proteinases

Arthritis

Arthritis is the inflammation of the joint as a result of synovitis. As the synovial fluid has become thinner it can no longer nourish or lubricate the articular cartilage that is worn away as the horse Works, this compression thins the cartilage making it less resistant to compression furthering the problem.

As the articular cartilage is worn away it releases **Lysosomal enzymes** into the already damaged synovial fluid that leads to another reduction in performance of the synovial fluid leading to more degeneration of the articular cartilage.

Because there is no direct blood supply to the articular surface there is no way for the articular surface to repair. This failure to repair leads to major cartilage damage and leads to bony changes of the joint called Osteoarthritis.

Articular Cartilage

- + Extremely thin yet Complex
- + Has No Direct Blood Supply
- + Composed of Chondrocytes
- + Primary Function
 - o Absorb Concussion
 - o Resist Compression
 - o Allow smooth gliding

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Osteoarthritis

Osteoarthritis is the most advanced stage of DJD and involves not only Articular Cartilage but the underlying subchondral bone. The key factors are

- ✚ Bony remodelling due to excessive compression
- ✚ Bones Change Shape at the Articular Surface
- ✚ Exostosis of the joint margins
- ✚ Narrowing of the joint spacing through chronic compression
- ✚ Exposure of subchondral bone due to the articular cartilage being removed
- ✚ The subchondral bone can become inflamed with acute micro-fractures

Causes

Direct trauma

DJD can be caused by direct trauma to the joint from external forces such as.

- Being kicked
- A Fall
- Interference (Forging ,Brushing ,Cross firing)

This trauma stimulates the ligaments and can lead to Synovitis.

Poor Conformation

The poor conformation of horses can lead to uneven loading of the joint causing uneven stresses being placed on the joint and its supporting structures, this then places uneven loading of the articular cartilage starting the process of synovitis.

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Poor Irregular Farriery

Poor shoeing can place uneven loading of the joints and start the process of DJD, this is because the lever arms acting upon the foot become out of balance due the natural growth of the feet.

Shoes that offer inadequate support to the feet include

-  Shoeing Short
-  Shoeing Tight
-  Irregular interval

Clinical Signs

The Clinical signs of DJD can include

-  Loss of function
-  Extosis
-  Changes in synovial Viscosity
-  Abnormal Shoe Ware
-  Lameness (mild to severe)
-  Joint Swelling (Articular Wingals)
-  Joint Fusion
-  Inflammation and Heat on palpitation

Diagnosis

The Diagnosis of DJD is based on observation of the Clinical signs with conformation only being made with the use of radiographs and MRI scans.

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Treatment

Veterinarian

Veterinary treatment is aimed at retarding the progression of DJD and making the horse more comfortable. This is done with the use of;

- ✚ Advising a reduction in work load (Rest)
- ✚ NSAIDS – Anti-inflammatory Drugs
- ✚ Box Rest
- ✚ Corticosteroids – help strengthen soft tissue structure
- ✚ H17 injections (hyaluronic Acid) to improve lubrication and aid in nourishment of the cartilage
- ✚ Arthrodesis (Fusion of low motion Joints)
- ✚ IRAP Joint Therapy

Farrier Treatment

The aim for the farrier is to create an even landing and loading throughout the joints and minimise the lever forced traveling through it.

A good foot trim is critical the Medial/Lateral & Dorsal/Palmar balance being correct. The HPA must also be assessed the maintained.

Shoe Choice

The shoe choice is aimed at reducing the brake over and providing a symmetrical platform for the limb.

Rolled Toe/Set toe

The use of a Rolled toe will reduce the brake over point of the foot and thus reduce the force needed to lift the heels. This shoe fitted with adequate support is the first step in helping a horse with early signs of DJD.

Bar Shoes

The use of bar shoes with or without clips will give the best support for the foot creating a symmetrical platform with even ground pressure.

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Graduated shoes

The use of a graduation will reduce the forces acting upon the joint.

Graduated Bar Shoe

A Graduated Bar shoe will help ease the brake over and provide a good support platform.

Rocker Shoe

A rocker Shoe can be used to imitate the articulation of a low motion joint.

Prognosis

As DJD in a progressive Degenerative disease a **Poor** Prognosis is given as there is no way to fix the degenerated articular cartilage.

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