

Juvenile osteochondritis dissecans (JOCD)

The sports career of a horse can be seriously compromised by OCD right from the foal's first months. These disorders have a serious economic impact for both the sport horse and the racing sector. In this fact sheet we will discuss these early disorders of the horse's musculoskeletal system.

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Technical level   



X-ray of a horse's hoof

What is juvenile osteochondritis dissecans (JOCD) ?

Juvenile osteochondritis dissecans (JOCD) is a common condition in horses, and is due to abnormalities in the bone formation process. Foals can be affected at a very young age.

JOCD includes :

- **Osteochondral lesions (OCD)** are characterized by :
 - **Irregularities or even fragmentation of the bone surface**
 - Formation of **subchondral** (part of the bone in contact with the joint) **bone cysts** (focal disturbance in endochondral ossification)
- **Bone fragmentation due to ligament traction**

These abnormalities result in **biomechanical pressure on the foal's immature skeleton**, leading to disturbances in the blood flow to the site of ossification. This biomechanical factor explains that lesions often occur in the same place on a joint.

What are the consequences of these disorders ?

The **economic impact** of these juvenile disorders for the horse sector can be significant, as they can decrease the **foal's value**, and compromise its **future performances**. Nevertheless, clinical signs are variable and depend on :

- The severity of the lesions (eg : size of the bone fragment)
- The affected joint : Osteochondral affections in tibial-tarsal joints (between the tibia, and the hock) can be subclinical, whereas lesions located on the stifle more often than not present clinical signs
- The location of the lesion in the joint.
- The use of the horse (leisure vs competition, level of competition, discipline)

Osteochondral lesions are most frequently subclinical. There is often a **nonpainful distention of an affected joint**, particularly when there is presence of a bone fragment. The distension can also lead to **synovial inflammation** (inflammation of the synovial membrane around the joint), which in turn leads to **joint pain and lameness**.

JOCDs are also the cause of **poor performances** in sport horses. Moreover, JOCDs can lead to development of **osteoarthritis or OA** (progressive degradation and

destruction of articular cartilage: the tissue lining the ends of the bones, and bone proliferation under the cartilage).

How are these disorders identified ?

These disorders are usually detected on a **preventative basis (before a sale, or when starting work)** or when there is a **clinical suspicion** (swelling of a joint, lameness, poor performance).

A **clinical examination** can orient diagnosis. During a **static examination, joints are palpated, and flexion tests carried out**, in order to show any signs of pain, or reduced amplitude of movement. This static examination can be supported by a **dynamic examination**, which will enable to fine-tune the diagnosis, in addition, **local anaesthetics** may be administered, so as to determine the precise location of pain.

The lesions can only be confirmed by **X-ray images** which can be supported by **Ultrasonographic examination**.

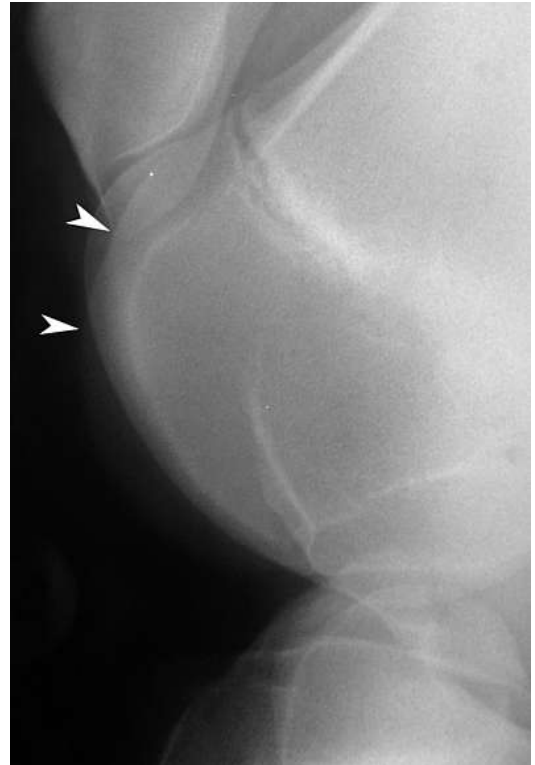
A study (ESOAP : Elevage, Statut Ostéo-Articulaire et Performances ;Breeding : osteo- articular status and performances) carried out in 2000 by Professor Jean-Marie Denoix, established an osteo-articular assessment of Thoroughbreds, Trotteur, and Selle-Français foals in Normandy, through the study of radiographic images of JOCDs between the ages of 6 to 18 months. This study showed that **JOCDs evolve greatly during the foal's first year, and up to 18 months**. Indeed, of the population studied in Normandy, only 32.3 % of abnormal X-ray images identified at the age of 6 months had not evolved at 18 months old, whereas 46.6 % had disappeared, and 38.7 % of abnormal Xray-images were new developments.

In the case of JOCDs, healing phenomena take place in the young horse's joints. Therefore, a **radiographic detection examination, at around the age of 12 months**, appears to be a good compromise between the necessity of early detection, and the stability of any abnormality observed at an earlier age. This takes into consideration that an assessment at the age of 6 months does not give a genuine idea of the future osteo-articular status of the animal. However, in the case of a physical abnormality detected in the younger foal (joint distension for example) it is recommended to carry out a radiographic examination.

Figure 1 : Complete recovery from an osteochondral lesion on the lateral Trochlear ridge of the distal femora (stifle joint). © CIRALE-ENVA



Oblique view of the stifle in a foal aged 6 months, showing a wide dip in the bone surface in the proximal third of the lateral Trochlear ridge of the distal femora (white arrows)



Oblique view of the stifle at the age of 18 months, showing absence of any bone surface abnormality of the lateral Trochlear ridge of the distal femora, indicating total recovery from the lesion identified at the age of 6 months (white arrows)

Figure 2: Rear peri-articular osteochondral fragmentation of the first phalanx on a hind fetlock, not identified at the age of 6 months © CIRALE-ENVA



Oblique view of the hind fetlock carried out aged 6 months, showing no abnormality of the rear part of the fetlock



Side view of the hind fetlock carried out aged 18 months, showing osteochondral fragmentation (nodule) on the rear of the first phalanx. (White arrow)

What are the factors which predispose to JOCDs ?

Osteochondritis has a **multifactorial etiology**, meaning that it results from several different factors :

Environmental factors :

- **Broodmares and the growing foals diets, plus mineral, vitamin and trace- element supplements=>** At the age of 6 months , foals from

mares having been fed cereal, are more likely to present osteochondral lesions than foals from mares fed exclusively on grass and hay.

- *Exercise and biomechanical pressure on the joints*=> Both **stabling a foal** in a box during its first year, even when turned out in a paddock, and giving access to **wide hilly expanses** can give rise to JOCDs. Acute joint trauma could also induce JOCDs, or worsen existing lesions.

Individual factors :

- **Growth**=> Several studies have identified that JOCDs in the stifle are more likely to be seen in foals who have a high average daily weight gain during the first few months of their lives.
- **Conformation**=> Studies have shown that the foal's height at the withers (aged 1 month) has an influence on the presence of lesions during the following months. Equally, height at the withers of the adult horse is related to prevalence of lesions of osteochondritis of hocks and fetlocks in the sport horse.
- **Breed**=> The ESOAP study for example has shown that JOCDs are more frequently observed in Selle-Français horses than in Thoroughbreds, but that the proportion of severe lesions is higher in the latter.
- **Genetic factors** : JOCDs are also **hereditary**, and are influenced by several genes.

How to manage JOCDs ?

Management of JOCDs depends on the severity of the lesions, the joint concerned, and the horse's use. A **conservative approach** (rest, anti-inflammatories) may be sufficient in some cases. However there is always a risk of the horse developing osteoarthritis.

It is therefore often advisable to consider **arthroscopic surgery**. This technique consists in making small incisions, to introduce an arthroscope (a camera) and surgical instruments, so as to treat a cyst, or remove a bone fragment.

Remember

- JOCDs are common disorders in horses and appear at a very young age.
- They have a multifactorial etiology : hereditary factors, the role played by the mare and foal's diet. However there are still a number of questions to be answered.
- JOCDs induce lowering of the horse's performance, or lameness.
- It is advisable to test for the condition at around the age of 12 months, and prior to starting work.
- JOCDs can bring on the onset of osteoarthritis, it is therefore advisable to have them surgically treated in most cases.

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