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La pathologie du pied et son imagerie médicale
Hufpathologie und Deren Bildgebende Verfahren
Hoof Pathology and Medical Imaging

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The pastern and fetlock areas of horses have a fairly rich and somewhat complex anatomy. These areas are common sites for a multitude of injuries and the lameness that ensues is fairly common in sport horses. Lameness of these areas can be sometimes difficult to diagnose and often presents a therapeutic challenge. Systematic approach will lead the veterinarian to a diagnostic in most cases. Diagnostic local anesthetic blocs are usually helpful localizing the general area of lameness but sometimes can difficult to interpret especially because of inconsistent and incomplete improvement and the diffusion of local anesthetic to surrounding structures.

Most commonly used imaging modalities for this region are radiology and ultrasonography, but selected cases can require more advanced techniques such as Nuclear Scintigraphy, Magnetic Resonance Imaging, or Computed Tomography.

SELECTED CONDITIONS OF THE PASTERN REGION

Pastern Degenerative Joint disease (DJD)
DJD of the pastern joint is most often due to the horses use. Jumpers, dressage horses and Western performance horses are most prone to it. It is sometimes secondary to osteochondrosis, fractures and bad conformation. Lameness can range from mild to severe and is positive to lower limb flexion. Palmar digital nerve block often will improve the lameness, but often analgesia of the palmar nerves at the level of the sesamoid bones is necessary and sometimes a ring block need to be added. Intra-articular block will improve the lameness significantly. Radiographs are most often diagnostic, oblique views are necessary for less chronic cases.

Treatment consists in rest periods, therapeutic shoeing, systemic NSAIDS, systemic hyaluronic acid and polysulfated glycosaminoglycans, and intra-articular injections using steroids or IRAP. Tiltudronate has been used successfully to improve some horses with this condition. In more advanced cases arthrodesis is necessary, which is achieved surgically.

Distal sesamoidean ligament desmitis
Injuries to the straight and oblique distal sesamoidian ligaments have been recognized as sources of lameness in sport horses. Lameness associated is usually mild to moderate.

Some improvement can be seen after palmar digital nerve block, but abaxial nerve block is usually necessary to alleviate the lameness. Often intra articular analgesia of the metacarpo/metatarso-phalangeal joints will significantly improve it, as well as analgesia of the digital flexor tendon sheath, leading to confusion. Ultrasound examination will most often be diagnostics. Care should be taken not to confuse the normal hypoechoic area of the straight distal sesamoidean ligament near the insertion on the second phalanx with a lesion.

Treatment includes rest periods and potentially ligament splitting and intra-lesional injections. Prognosis for return to performance is good.

Distal digital annular ligament desmitis
Lesion to the distal digital annular ligament (at the level of the second phalanx) is not frequently encountered as a cause of lameness. Digital flexor tendon sheath effusion is not necessarily effusive. Horses will be mildly lame, and the lameness will block to a palmar digital or an abaxial nerve block, as well as to a block of the digital although cross sectional imaging modalities could be used to further define the injury.

Conservative treatment consists in rest, controlled exercise and injection of the digital flexor tendon sheath with steroids. This conservative approach will most often allow return to performance. In recidiving cases,
tenoscopic exploration of the digital flexor tendon sheath and release of the distal digital annular ligament might be necessary.

Tendonitis of the insertion branches of the superficial digital flexor tendon
Lesions of the insertion branches of the SDFT cause usually a mild lameness that is alleviated with an abaxial sesamoid nerve block. Acutely, mild swelling can be palpated around the branches. Diagnosis is made with ultrasonography. Treatment consists in rest, controlled exercise and shock wave therapy. Prognosis for return to performance is usually good in non race horses.

DDFT injuries in the pastern area
Sport horses, particularly those used for jumping events (jumpers, hunters and three-day event horses), are the most commonly affected, although lesions are also occur relatively frequently in dressage, endurance and western performance horses and occasionally in pleasure horses. The typical history includes unilateral forelimb lameness that is alleviated by perineural anesthesia of the palmar nerves at the level of the sesamoid bones. Lameness severity ranges from 1 to 3 out of 5 on the AAEP lameness grading scale although occasional horses with very severe lesions present with a more severe lameness (4/5). Digital flexor tendon sheath intra-thecal anesthesia will resolve or substantially improve the lameness. A large percentage of lesions can be reliably identified on ultrasound using a micro-convex probe positioned between the heel bulbs, but in some horses, their conformation as well as the more distal location of the lesion will prevent identification. Advanced cross-sectional imaging modalities such as Magnetic Resonance Imaging (MRI) or Contrast Enhanced Computed Tomography (CECT) allow the visualization of the DDFT and its surrounding structures with a high reliability and are therefore preferred. Most of the lesion of the DDFT at the level of the pastern will be localized at the level of the middle phalanx.

Case management varies depending on lesion severity, location and the owners’ wishes. In all cases, corrective shoeing and a 6 to 9 months rehabilitation program including periods of rest and controlled exercise are prescribed. In many cases intra-lesional injections are performed using CT guidance while the horse is under anesthesia, ultrasound or radiographic guidance while the horse is standing and sedated. Injections into the tendon are usually reserved for core lesions, longitudinal splits or enlarged DDFT lobes. The medications used in our hospital include bone marrow supernatant, fat derived mesenchymal stem cells, or platelet rich plasma.

SELECTED CONDITIONS OF THE FETLOCK REGION

Injury of the collateral ligament of the metacarpo/metatarso-phalangeal joint
More common in eventers, jumpers and cutting horses, but also seen in horses working or housed on irregular surfaces (pasture, endurance horses).

Lameness ranges from 2 to 4 out of 5. Acutely, joint distension will be present. Lameness is accentuated by lower limb flexion. Abaxial nerve block and intra-articular block can improve the lameness but a low four point is usually necessary to alleviate the lameness.

Radiographs will not be helpful unless secondary joint disease has developed or the ligament is injured enough to allow joint laxity (stress views). Ultrasonographic examination of the two component of each collateral ligament will yield a definitive diagnosis. Treatment consists in rest, controlled exercise, therapeutic shoeing and anti-inflammatory therapy. Prognosis for return to athletic activities is good.

Cystic lesions of the distal third metacarpus/metatarsus
Such lesions can be developmental or have a traumatic origin. Trauma can be direct trauma causing a fissure in the articular cartilage or causing joint instability. Joint effusion is not a consistent feature. Lameness improves at least partially to an intra-articular block. Radiography is usually diagnostic. Treatment consists in arthroscopic debridement. Prognosis for return to performance is fair for high level performance horses, and good for lower level horses.

Axial sesamoiditis
These osteolytic lesions of the axial border of the sesamoid bones are not frequent. Horses present with a mild to moderate lameness that improve sometimes with the block of the palmar nerves at the level of the sesamoid bones, but often require a low 4 or low 6 points nerve block to be completely alleviated. Intrasynovial analgesia of the metacarlo/metatarso-phalangeal joints or the digital flexor tendon sheath will improve partially the lameness. A septic component has been documented in some of the cases. Diagnosis is made using radiography. Ultrasound will most of the time depict the lesion. In early cases, cross sectional imaging (Computed Tomography) is necessary to reach the diagnosis.

Conservative treatment using rest, antibiotic therapy and potentially Tiludronate can be attempted. Often surgical debridement will be necessary. Approaching the lesion is done arthroscopically through the palmar/plantar pouch of the fetlock joint or through the digital flexor tendon sheath. Cross sectional imaging can help determine the best approach depending on the conformation of the lesion. Usually the approach through the fetlock joint is preferred as less trauma will be inflicted to the intersesamoidean ligament. Prognosis for return to performance is fair.

Pathology of the digital flexor tendon sheath (DFTS) and content
Lameness associated with the DFTS and content is usually accompanied by effusion. Effusion (and mild synovitis) can however be present without any primary cause (idiopathic), and a lesion of the DDFT, SDFT or associated structure can be present with minimal
effusion. Lameness can range from 1 to 4 out of 5. Depending on the level of the primary injury within the tendon sheath, lameness can be improved with a palmar digital, abaxial or low four/six point nerve block. Intra-synovial block will significantly improve the lameness. Ultrasonographic examination will often identify a primary lesion which can consists in a SDFT, DDFT, manica flexoria lesions, palmar annular ligament, distal digital annular ligament thickening or synovial proliferation. Linear tears of the DDFT and SDFT may not be identifiable on ultrasound and this might be due to weight bearing. Cross sectional imaging modalities such as MRI and Contrast Enhanced CT have identified lesions that were not seen on ultrasound.

Tenoscopic exploration is routinely used for diagnostic purposes as well as therapy. Conservative management consists in rest and controlled exercise periods, intratendinous injections of tendinous core lesions, intrathecal injections of hyaluronic acid and steroids. However, many cases will require tenoscopic exploration, debridement of potential tendinous lesions, and potential release of thickened palmar annular ligament or distal digital annular ligament. Prognosis depends on the extent of the lesions and ranges from fair to good.