Proceeding of the SEVC
Southern European Veterinary Conference

Oct. 17-19, 2008 – Barcelona, Spain

http://www.sevc.info

Reprinted in the IVIS website with the permission of the SEVC
www.ivis.org
Equine

Treatment of Disorders of the Distal Interphalangeal Joint Under Arthroscopic Supervision

Dr. A. Fürst
DECVS - Facultad Vetsuisse, Universidad de Zurich

I. Bone fragments in the distal interphalangeal joint of horses

Introduction

Fracture of the extensor process is a relatively common occurrence in warmblood horses. The cause is most likely the result of hyperextension of the distal interphalangeal joint. Fractures are frequently bilateral and usually occur more often in the forelimbs than the hind limbs. The bone fragments may be small without joint involvement or very large with joint involvement. Affected horses may be asymptomatic, and the fractured extensor process is an incidental finding on radiographs. Other horses may have mild to moderate acute supporting limb lameness with mild to moderate lameness in the turn. The fracture is best seen on lateromedial views. The differential diagnosis includes a separate ossification centre and osteochondritis dissecans.
Treatment

There is no optimal treatment for horses with large bone fragments, and conservative treatment is instituted in horses that are not lame. Bone fragments must be removed in horses that are lame; this can usually be accomplished via arthroscopy without rendering the joint unstable. Postoperatively, a bandage or, preferably, a cast is applied. Internal fixation using a 3.5- or 4.5-mm screw can be attempted, but complete healing is rarely achieved with this method. Small fragments should always be removed because they will eventually cause problems. Arthroscopy is the method of choice for fragment removal because it is minimally invasive and convalescence time is short. Horses with small fragments and no radiographic evidence of arthrosis have a good prognosis.

Arthroscopy:

With the limb extended, a 21 gauge needle is inserted into the distal interphalangeal joint, which is then filled with CO2 (or 20 – 40 ml lactated Ringer’s solution). Needle placement in the joint is not easy and the amount of synovia aspirated is small because there is very little joint pressure with the horse in recumbency. Therefore, a 5 ml syringe should be used to confirm that the needle is correctly positioned: if air can be injected easily, then the needle is most likely in the joint. Air allows a good arthroscopic view of the joint, whereas after injecting Ringer’s solution, the surgeon is working with a pressure of 150 mm Hg. With the limb in extension, the instruments are introduced into the joint starting approximately 2 cm proximal to the coronary band and approximately 1 cm from the median. The pouch of the joint cavity is shaped like a bell curve. If the arthroscope is introduced too far proximally (3 cm), then the tunnel from the skin to the joint is usually too long, which impairs movement of the scope within the joint space. If the arthroscope is introduced to close to the median, then visualisation of the bone chip is very difficult. The arthroscope is introduced laterally because bone chips are usually located more medially. After incising the skin and joint capsule, the arthroscope cannula and obturator are introduced into the joint. The other instruments are introduced medially. An alternative approach is paramedian and somewhat more distal than that for the arthroscope. Orientation is difficult because everything in the view appears very close. The 2nd phalanx (P2) is located ventrally and has smooth cartilage and a scale-like appearance. Villi and fibres that obstruct the view of the 3rd phalanx (P3) are seen dorsally, and the bone chip is located within these structures. Bone chips usually appear uneven with a rough surface, are seldom round and often obscure the view.
of P3. The surgeon must identify the border between the bone chip and P3. The abaxial regions must also be thoroughly examined because small fragments may be hidden here. Some fragments are firmly attached while others are easy to dislodge; the best method of detaching the chip is by using an elevator, which is placed between the chip and P3. Bone chips vary in size and are usually soft, which makes removing them in one piece very difficult. Therefore, they are usually removed in pieces. Some bone chips are firmly attached to the extensor tendon sheath, which necessitates turning the arthroscope to properly examine the tendon. At the end of the procedure, the arthroscope should be introduced through the instrumentation channel to examine the fracture bed from a different view. This provides additional important information.

![Schematic representation of arthroscopy of the distal interphalangeal joint](image)

**Arthroscopic photo showing an extensor process that is almost detached**

**Prognosis:**

The prognosis is good provided that the distal interphalangeal joint has no arthrotic changes and the bone chip is small. However, the prognosis is guarded when there are arthrotic lesions or the bone fragment is large.

**II. Cystoid defects/subchondral cystic lesions in the third phalanx in horses**

**Introduction**

Cystoid defects of the third phalanx are irregular and sometimes circular to oval radiolucent areas. These defects are usually found centrally in the bone, and they often communicate with the distal interphalangeal joint. A number of disorders can produce cystoid defects: impaired enchondral ossification, fissures in the cartilage and subchondral bone, vascular disturbances, infection and increased concentrations of prostaglandin E2 and interleukin 1 and 6 5-7. Conservative treatment with benzopyrone and calcium dobesilate was successful in one study. However, surgical treatment has had the best outcome. The content of the cyst is removed by curettage, and the defect is filled with osteoinductive, osteoconductive and/or osteopromotive material. Cystoid defects can be accessed via an articular approach, which entails opening the distal interphalangeal joint just enough to introduce surgical instruments into the defect. In other cases, the approach chosen has been via the hoof wall. In one study, nine of 10 horses with cystoid defects were successfully operated and returned to previous athletic performance. 8,9.
Postmortem specimen showing a cystoid defect of the 3rd phalanx

Close-up of photo on left

Curettage of the cyst

Dorsopalmar view: Radiograph showing a cystoid defect in the 3rd phalanx
Treatment

Cystoid defects can be treated via an articular approach.10 The distal interphalangeal joint must be opened sufficiently to allow introduction of the instruments into the defect. An alternative approach is via the hoof wall.11 After drilling into the cyst, it is carefully curretted and then filled with a bone transplant, parathyroid hormone or tricalcium phosphate. This procedure provides drainage, promotes vascularisation and fills the defect with new bone.

Prognosis

The prognosis is good in young horses but guarded in older horses. The most common complication is infection. In one study, nine of 10 operated horses returned to competition.10

Injuries and infection of the distal interphalangeal joint

Infection of the distal interphalangeal joint must be treated promptly and aggressively to avoid further damage and complications. Arthroscopic lavage of the distal interphalangeal joint is extremely important to prevent or treat infection. The dorsal as well as the palmar/plantar pouches must be lavaged via arthroscopy.

References


