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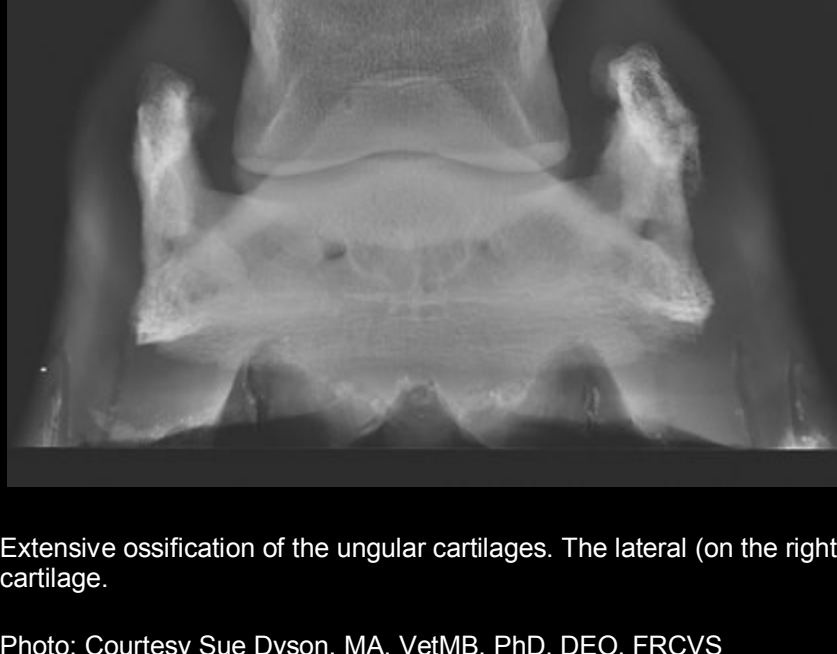
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## Are Ossified Ungular Cartilages Clinically Significant?



Extensive ossification of the unguicular cartilages. The lateral (on the right) unguicular cartilage is thicker than the medial cartilage.

Photo: Courtesy Sue Dyson, MA, VetMB, PhD, DEO, FRCVS

Cartilage is a tough, but flexible, tissue found in many locations in horses' bodies, such as in joints and between bones. Bone, on the other hand, is a rigid tissue that makes up a horse's skeleton. Both are important structures, but they serve different purposes. So what happens when cartilage ossifies (hardens into bone)?

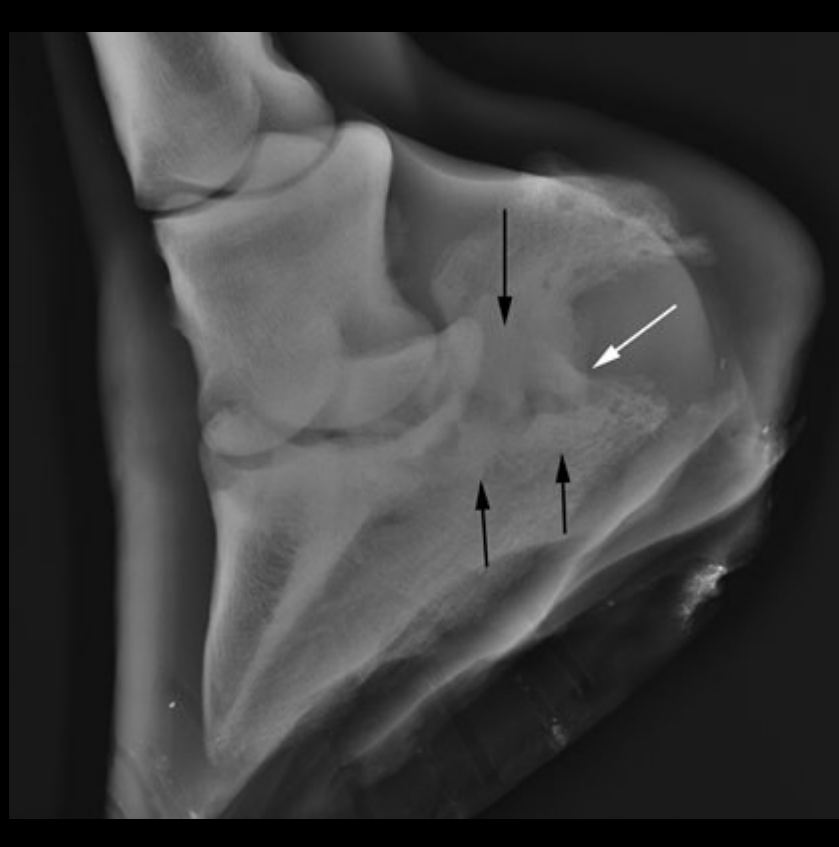
At the 2015 World Equine Veterinary Association Congress, held Oct. 8-10 in Guadalajara, Mexico, Sue Dyson, MA, VetMB, PhD, DEO, FRCVS, presented the results of a study to determine whether ossified unguicular cartilages are a clinically significant finding in horses. Dyson is the head of clinical orthopaedics at the Animal Health Trust Centre for Equine Studies, in Newmarket, England.

The unguicular cartilages are located on either side of the coffin bone in the horse's hoof and are thought to aid in shock absorption, support of the back of the foot, and venous return. When this structure ossifies, veterinarians know there is an increased risk of injury to the collateral ligament of the coffin joint and other nearby structures. Further, ossified cartilages are less able to dissipate energy from the ground reaction, also predisposing the horse to injury. But veterinarians weren't sure whether ossified unguicular cartilages themselves would prove to be a clinically significant finding on radiographs.

So Dyson and Laura Jones, BVSc MRCVS, a junior clinician at the Centre for Equine Studies, reviewed radiographs of 1,255 front feet and narrowed the study field to 386 hooves on 271 horses. All the included feet had unguicular cartilages that scored 2 or higher on a 0 to 5 scale (with 5 being the most severe and 0 being no ossification). During their evaluation, Dyson and Jones determined the shape of the ossified cartilage, as well as which radiographic views they were best evaluated on and any other abnormalities noted on the X rays. They also noted whether there were any significant associations between the unguicular cartilages and lameness and other abnormalities.

They determined that:

- 42 horses had injury causing lameness directly related to the unguicular cartilages (determined by scintigraphy or MRI), and in 27 of these (64%) the ossified cartilages were graded 4 or 5;
- However, 32/131 horses (24.4%) that underwent MRI had grade 4 or 5 ossification of an unguicular cartilage, but the final primary diagnosis for the cause of lameness was related to other lesions;
- Fractures were most common in Grade 4 or 5 ossified cartilages;
- Feet with ossified cartilages graded 4 or 5 were more likely to have additional bone modeling and other adaptive changes than those with cartilages graded 2 or 3;
- Feet with abnormally shaped cartilages were more likely to have bone modeling and other adaptive changes than those with normally shaped cartilages; and
- Bone modeling and adaptive changes were often associated with lameness caused by bone trauma or fracture.



A flexed image of the same foot as above shows the very abnormal shape of the lateral ossified unguicular cartilage, with palmar extension proximally, can be seen. There is extensive increased opacity in the spongiosa (black arrows) of the ossified unguicular cartilage on other side of a radiolucent line (white arrow) which could reflect a junction between separate centres of ossification or a chronic fracture. There is intense increased radiopharmaceutical uptake at the base of the ossified cartilage indicating a likely site of trauma and pain causing lameness. There is also new bone formation on the palmarolateral aspect of the middle phalanx, enthesesous new bone at the insertion of the chondrocoronal ligament.

Photo: Courtesy Sue Dyson, MA, VetMB, PhD, DEO, FRCVS

Therefore, the team concluded that extensive ossification in association with bone modeling and adaptive changes were risk factors for lameness associated with injury of the ossified unguicular cartilage or the adjacent coffin bone.

Dyson also briefly reviewed diagnostics. She explained that ossified cartilages are firm to palpate, but horses with injuries of an ossified cartilage often don't show many other signs of a problem, other than lameness. Affected horses can have a variety of hoof conformations, and lameness is usually mild, even when cartilages fracture. Lameness is generally most visible on a circle, and in some cases horses are only lame when ridden.

Veterinarians need to use nerve blocks to localize pain—the most effective usually being palmar nerve blocks performed at the fetlock joint level, but in some horses a low four-point block above the fetlock joint is needed to improve associated lameness. Then, veterinarians can radiograph the affected area. She encouraged attendees to use several radiographic views—including weight-bearing dorsopalmar (a front view), oblique images of a flexed foot, and an 'upright pedal' view—to garner the most information.

"Ossified unguicular cartilages can be of clinical significance," Dyson concluded. "Valuable information about the ossified unguicular cartilages, such as a fracture at the base, may be missed without oblique images of a flexed foot."