Surgical Management of Osteochondrosis in Foals

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KEYWORDS

• Osteochondrosis • Osteochondritis dessicans • Arthroscopy • Femoropatellar joint • Tarsocrural joint • Fetlock joint

KEY POINTS

- Osteochondrosis is a common developmental disease in young horses.
- Osteochondrosis is caused by failure of normal endochondral ossification and most commonly affects the articular–epiphyseal cartilage.
- Osteochondrosis is a multifactorial disease with trauma, biomechanical forces, nutrition, exercise, cartilage vascularization, and genetics playing contributory roles.
- Horses with osteochondrosis often show lameness and joint effusion. Radiographs are usually diagnostic, although some lesions are only apparent arthroscopically.
- Arthroscopic debridement of abnormal cartilage and subchondral bone is the most common treatment and is indicated in horses with clinical signs.

INTRODUCTION

Osteochondrosis is a common developmental orthopedic disease and frequent cause of lameness in young, athletic horses.[1] It is a complex disorder, but can be primarily defined as focal failure of endochondral ossification leading to an area of growth cartilage that fails to undergo matrix calcification and vascular invasion and, therefore, is not converted to bone (**Fig. 1**).[2]

Osteochondrosis lesions are generally first seen as fissures in articular cartilage with cartilaginous or osteochondral fragments detaching from the parent bone, possibly forming free intraarticular fragments.[3] The term osteochondritis dessicans is used to describe lesions with loose or separated flaps of cartilage. Although the clinical manifestations of osteochondrosis are well-described, the definitive cause remains unknown and likely involves several factors, including biomechanical forces, nutrition, and genetics. In the horse, osteochondrosis most commonly affects the femoropatellar, tarsocrural, and metatarsophalangeal/metacarpophalangeal joints, although it can also be diagnosed in other joints.

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Vet Clin Equine 33 (2017) 379–396
http://dx.doi.org/10.1016/j.cveq.2017.03.010 **vetequine.theclinics.com**

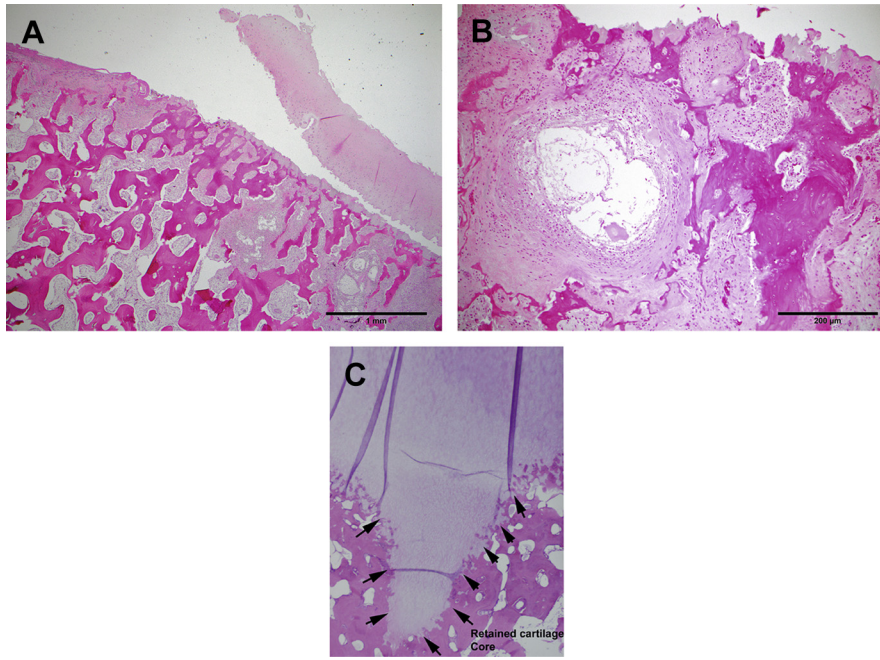

Fig. 1. (*A*) Hematoxylin and eosin (H&E)–stained osteochondral section from a humeral head of a Thoroughbred yearling with osteochondrosis. A cartilage flap is seen dissecting away from the subchondral bone. (*B*) H&E–stained section from the glenoid of the same yearling showing a subchondral cystic lesion and secondary osteoarthritis. (*C*) H&E–stained osteochondral section from the lateral trochlear ridge of the femur of a Standardbred yearling showing a retained cartilage core consistent with osteochondrosis. (*From* Engiles JB. Diseases of the skeletal system. In: Buergelt CD, Del Piero F, editors. Color atlas of equine pathology. Ames(IO):John Wiley & Sons, Inc.; 2013:301–43; with permission.)

This review discusses the etiology, causative factors, and clinical signs associated with osteochondrosis in the young horse with a focus on surgical treatment options for specific joints affected.

ETIOLOGY

The cartilaginous primordial skeleton begins the process of endochondral ossification during early fetal development with longitudinal growth of long bones extending from physes after birth.[4] During endochondral ossification, chondrocytes proliferate, hypertrophy, and then undergo apoptosis followed by calcification. Osteoblasts are responsible for deposition of primary bone after calcification, which is then successively remodeled into bony trabeculae. This remodeling process continues into adulthood. In long bones, the articular–epiphyseal cartilage undergoes a similar ossification process to the physis. Although osteochondrosis can develop at either location, the articular–epiphyseal cartilage is the more common site of clinical osteochondrosis in horses.[5]

CAUSATIVE FACTORS

Many causative factors have been proposed, including trauma and biomechanical forces, exercise, nutrition and hormonal factors, failure of vascularization, and genetics. The influence of trauma and biomechanical forces is supported by the