Orthopedic Conditions of the Premature and Dysmature Foal

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KEYWORDS

• Incomplete ossification • Premature • Dysmature • Hypothyroid • Cuboidal bones

KEY POINTS

- Incomplete ossification of the cuboidal bones is a common finding in premature and dysmature foals, and possibly in foals with hypothyroidism.
- Radiographs of the carpus and tarsus should be performed in any high-risk foal to obtain a diagnosis.
- Goals of treatment include limiting weight bearing and exercise.
- Complications including angular limb deformities, degenerative joint disease, and osteochondrosis dissecans may occur.
- Prognosis is guarded depending on the degree of incomplete ossification.

PREMATURITY AND DYSMATURITY OF THE FOAL

Gestational length of the horse is variable, ranging from 310 days to 370 days. Traditionally, the term *premature* is defined as a preterm birth of less than 320 days' gestation; however, given the inherent variability of gestational length, foals with signs of prematurity may be born following a gestational length of more than 320 days. Foals born postterm are considered *dysmature*. These foals have clinical characteristics of a premature foal despite a normal gestational length.[1]

The cause of prematurity and dysmaturity is typically unknown, although they may occur as a result of a high-risk pregnancy. Causes of high-risk pregnancy are included in **Box 1**. Multisystemic failure of the foal is possible, and thus a full physical examination of the foal is warranted. Common clinical signs of prematurity/dysmaturity are listed in **Box 2**. In particular, musculoskeletal problems are common. The most significant complications include incomplete ossification of the cuboidal bones, decreased muscle tone, and flexor tendon laxity.[1]

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Box 1
Causes of high-risk pregnancy

Maternal Causes	Fetal Causes
History of previously abnormal foal	Twins
Systemic disease/endotoxemia	Fescue toxicosis
Malnutrition	Umbilical abnormalities
Uterine abnormality or torsion	Congenital abnormality
Placentitis	
Hydrops	
Pelvic anatomic abnormality	
Mare reproductive loss syndrome	
Hyperlipemia	
Hypogalactia	
Dystocia	

PATHOPHYSIOLOGY

The skeletal structures of the developing fetus are initially cartilaginous and then ossify as the fetus develops in utero. Ossification begins as gestation progresses, with ossification of the carpal and tarsal bones being among the last bones to ossify, typically beginning in the last 60 to 90 days of gestation. Most of this ossification occurs in the last several weeks of gestation and continues with in the first month postpartum.[2–4] Ossification of the carpus begins at approximately 254 days' gestation and initiates

Box 2
Clinical characteristics of premature/dysmature foals

General Characteristics

Low birth weight

Small frame

Silky hair coat

Domed forehead

Poor cartilage development of ears

Weak suckle

High chest wall compliance

Low lung compliance

Poor thermoregulation

Gastrointestinal tract dysfunction

Poor renal function

Entropion

Poor glucose regulation

Musculoskeletal Characteristics

Incomplete ossification of cuboidal bones

Flexor tendon laxity

Decreased muscle tone