

Umbilical Infections

Ella Pittman, DVM

Introduction

Umbilical infections, also called omphalitis or omphalophlebitis, are inflammations of any one of the structures that make up a foal's belly button. The umbilicus consists of two arteries, a vein, and the urachus. The umbilical arteries carry deoxygenated blood away from the fetus and return the blood to the placenta. The umbilical arteries give rise to the round ligaments of the bladder in the adult. The umbilical vein brings oxygenated and nutrient-rich blood to the fetus from the maternal circulation. In the adult the umbilical vein becomes the round ligament of the liver. The urachus is a remnant of the canal that drains the fetus' bladder.

Pathogenesis

At birth, the umbilicus breaks, leaving behind a small external remnant and a large internal remnant. Bacteria can invade the large internal remnant through the external remnant, leading to localized infection of one or more of the aforementioned umbilical structures. The bacteria can then get into the bloodstream and cause infection at other sites including the lungs, gastrointestinal tract and joints. When this happens, the foal becomes septic and is very sick.

Clinical Signs

Clinical signs vary, depending on whether the foal is septic. Generalized non-specific signs include fever, inappetence, depression, or lethargy. Signs specific to infection of the umbilicus (with or without sepsis) include umbilical swelling, purulent discharge, heat and pain. In foals with primary sepsis or sepsis secondary to an infected umbilicus, clinical signs can affect other organ systems. These include difficulty breathing, rapid breathing, diarrhea, colic, swollen joints, lameness, or recumbency.

Diagnosis

Diagnosis can be made by physical exam and palpation of the umbilicus but not always. External signs (heat, pain, swelling, purulent discharge) may or may not be present. In some cases, an infected umbilicus is only suspected because the foal has a fever without another obvious cause or has a swollen joint. Serum amyloid A and fibrinogen, two markers of inflammation in the blood, are usually elevated. The gold standard for diagnosis is enlargement of one or more of the structures on ultrasound. Hyperechogenic material (pus) can often be appreciated as well.

Treatment

Options for treatment include medical management and surgery. Broad-spectrum antibiotics should be initiated with either course of treatment. Candidates for medical management are those with localized infection (i.e. not septic) and those who are not anesthetic/surgical candidates due to other medical conditions. Recheck ultrasound of the

affected umbilical structures should be performed every five to seven days to ensure that the treatment is working. If the foal is not responsive to medical therapy, has a large lesion and/or has multiple structures affected, or has multiple affected organ systems, surgery to remove the infected structures provides the best long-term prognosis.

Prevention

First line of defense in protecting a foal from any disease, including umbilical infections and sepsis, is to ensure adequate colostrum uptake. Foals should nurse within 2 hours of birth. The first milk they receive from mom is called colostrum, which is rich in immunoglobulins - the soldiers of our immune system. Colostrum is specifically high in an antibody called IgG. At birth, the foal's gastrointestinal tract is "open," meaning that the foal can absorb mom's immunoglobulins. Greatest absorption occurs within the first 6 hours and then declines until the gastrointestinal tract closes at 24 hours. This entire process is called passive transfer of immunity. It is important to check a foal's IgG level at about 12 hours following birth to ensure the foal has received adequate immunoglobulins. Adequate levels are >800. Foals with levels below 400 should receive plasma before their gastrointestinal tract closes.

The umbilicus should also be dipped several times after birth in order to encourage the umbilicus to "dry" and close. Current recommended dipping agents include dilute chlorhexidine or iodine solutions. Ensure the chlorhexidine or iodine is a solution not a scrub. Using agents that are too caustic or dipping too much can cause scalding of the ventral abdomen and may promote patency of the urachus.

Source: Reed *et al.* Equine Internal Medicine. 2010.