

## What Is Your Diagnosis?

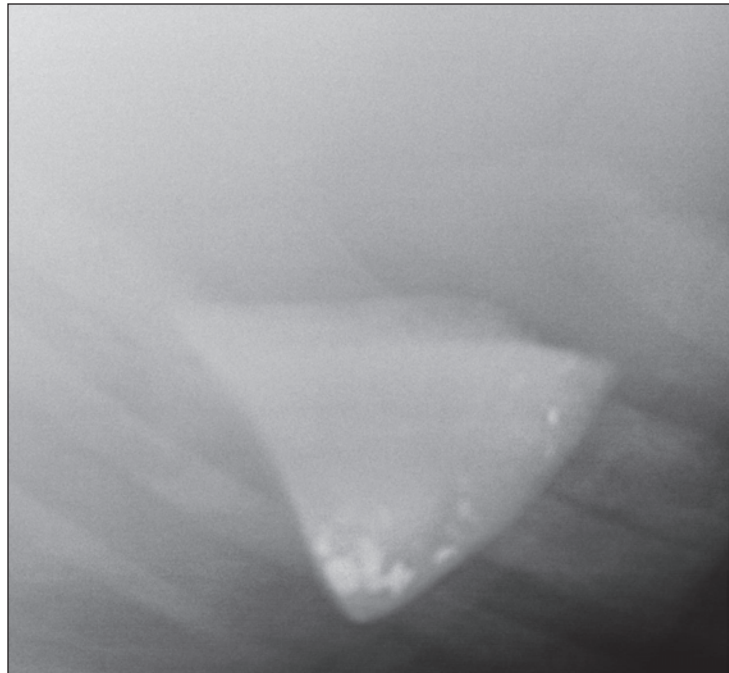


Figure 1—Right to left cranioventral radiographic view of the abdomen of a Thoroughbred mare evaluated because of mild to moderate signs of colic of 24 hours' duration.

### History

An 18-year-old Thoroughbred mare that was 3 months pregnant was referred because of mild to moderate signs of colic of 24 hours' duration. The horse was housed in a 1-acre dirt paddock and fed a diet of alfalfa, oat, and grass hay of equal portions twice a day from a bin. The horse had free access to water from a trough and had lived in California for 5 years. The horse was treated regularly with an ivermectin-based anthelmintic, and its vaccination status was adequate.

During the initial evaluation, the mare was quiet, alert, and responsive. On physical examination, the rectal temperature was 38.2°C (100.9°F; reference range, 37.5° to 38.3°C [99.5° to 101°F]), the heart rate was 48 beats/min (reference range, 28 to 40 beats/min), and the respiration rate was 16 breaths/min (reference range, 10 to 14 breaths/min). The mucous membranes were pale pink and moist, and capillary refill time was < 2 seconds. Normal to increased borborygmi was detected in all 4 abdominal quadrants on auscultation. The PCV was 46.3% (reference range, 32% to 46%), and total protein concentration was 6.4 g/dL (reference range, 6 to 8.5 g/dL). Rectal examination findings were unremarkable; the fetus was palpable in the right uterine horn. Ultrasonography of the abdomen was performed rectally and transcutaneously; findings were unremarkable. Cytologic examination of fluid obtained via abdominocentesis revealed 1,960 WBC/dL (reference limit, < 5,000 WBC/dL), and the total protein concentration was 2.0 g/dL (reference limit, < 2.5 g/dL). Radiographs of the abdomen were obtained (Figure 1).

Determine whether additional diagnostics are required or make your diagnosis from Figure 1—then turn the page ▶

This reported was submitted by James Schachtel, BVet Med, and Elaine Carpenter, DVM, MS, DACVS; from Peninsula Equine, Star Medical Center, 100 Ansel Ln, Menlo Park, CA 94028. Dr. Schachtel's present address is Fairfield Equine Associates, 32 Barnabas Rd, Newtown, CT 06470. Dr Carpenter's present address is Chaparral Animal Hospital, 18432 N Cave Creek Rd, Phoenix, AZ 85032. Address correspondence to Dr. Schachtel.

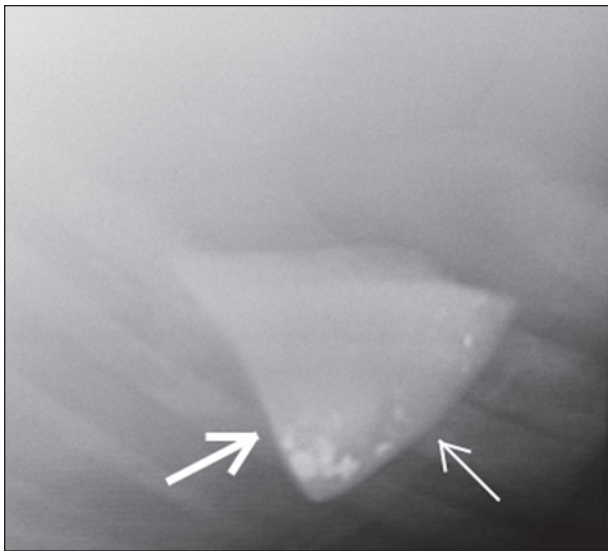


Figure 2—Same radiographic view as in Figure 1. Notice the cranioventral (thin arrow) and caudoventral (thick arrow) borders of the sand conform to the most dependent aspect of the colon.

### Radiographic Findings and Interpretation

The pyramidal, radiopaque structure is consistent with sand and gravel in the ascending colon, most likely in the diaphragmatic or sternal flexures of the dorsal or ventral portions of the large colon, respectively (Figure 2).

### Comments

Abdominal radiographs are an effective and accurate method for diagnosing and monitoring sand in the intestine.<sup>1,3</sup> The most thorough technique involves obtaining 4 to 5 overlapping radiographs using a right to left, standing lateral radiographic view.<sup>4</sup> The cranioventral radiographic view was obtained by use of digital radiography equipment,<sup>a,b</sup> with a grid<sup>c</sup> at 120 kV (peak) and 100 mA, and the image was processed.<sup>d</sup> The most useful radiographic view is the cranioventral view because sand most often accumulates in the cranial aspect of the dorsal and ventral portions of the ascending colon.<sup>1,3,5-9</sup> The shape of sand within the colon varies considerably; in the horse of this report, the sand and gravel structure is distinct because it assumed the shape of the surrounding colon. The cranioventral and caudoventral borders of the sand conformed to the most dependent aspect of the colon. This shape is potentially caused by a contraction-migrating myoelectric complex of the colon, constricting around the sand, giving it a defined perimeter. A second right to left standing lateral cranioventral radiograph was obtained by projecting the radiographic beam 2 rib spaces caudally (Figure 3). The radiopaque structure is less defined on all borders, and the margins appear to be interspersed with gastrointestinal material.

Sand enteropathy can be defined as the accumulation of abnormal amounts of sand or small gravel within the gastrointestinal tract such that it causes clinical signs. The amount of sand that may ultimately cause clinical signs is not known and may vary in individual horses.<sup>1,5</sup> Clinical signs of sand enteropathy are consistent; the most common clinical sign is acute, chronic, or recurrent colic. Other clinical signs include diarrhea, which may be intermittent or consistent, and mild to

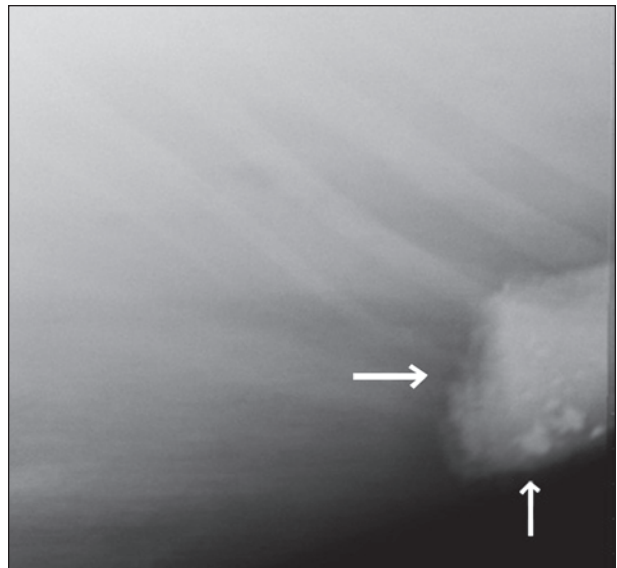


Figure 3—Right to left cranioventral radiographic view of the abdomen of the horse in Figure 1 obtained by projecting the radiographic beam 2 rib spaces caudally to that in Figure 1. The radiopaque sand and gravel structure is less defined on all borders, and the margins appear to be interspersed with gastrointestinal material (arrows).

severe weight loss, anorexia, poor hair coat, irritability, and exercise intolerance.<sup>1-9</sup>

The horse of this report was initially treated with fluids administered parenterally and enterally for 24 hours and anti-inflammatory medications; psyllium hydrophilic mucilloid (psyllium) was administered via nasogastric tube. The horse was slowly introduced to its normal diet after resolution of clinical signs. Long-term management included addition of psyllium (1 g/kg [0.45 g/lb]) to the diet once daily for 7 days each month, and management practices were adjusted to avoid sand or gravel intake.

- a. Milestone HF, Columbus, Ohio.
- b. Elkin Rapid Study digital radiography, Sunnyvale, Calif.
- c. Grid, 14 × 17 inch, 103 lines/inch, 10:1, X-Ray Marketing Associates Inc, Romeoville, Ill.
- d. eFilm work station, version 1.80, Merge eFilm, Milwaukee, Wis.

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