History

A 3-year-old female red-eared slider turtle (*Trachemys scripta elegans*) weighing 240 g (0.53 lb) was evaluated because of recurring episodes of cloacal prolapse. The turtle had been maintained in an outdoor pond with other turtles for 1 year prior to being moved indoors. The diet consisted of aquatic turtle pellets, romaine lettuce, cooked salmon, and assorted wild vegetation. Within 1 month after being transferred to an indoor enclosure, the turtle developed a cloacal prolapse. Treatment consisted of multiple reductions and placement of purse-string sutures that were kept in place for 1-week durations. The turtle was treated concurrently with enrofloxacin on the basis of cloacal bacterial culture and antimicrobial susceptibility results. Bacteria identified were *Aeromonas hydrophila*, *Pasteurella* sp, and *Acinetobacter* sp. Prolapse typically recurred several days after each suture removal. After the third prolapse, the turtle was referred for further evaluation.

On physical examination, the turtle was active and alert. However, on the basis of a scoring system where 1 = emaciated, 2 = underfed, 3 = normal, 4 = well fed, and 5 = obese, the turtle's body condition score was judged to be 2. A purse-string suture was present, and the cloaca was still reduced from the previous surgery. The owner had observed that the turtle's appetite began to slowly decrease since the prolapses had started. Regurgitation also occurred sporadically within 72 hours after eating, and scant amounts of feces were being produced.

Blood was collected from the occipital sinus and placed in ammonium heparin microhematocrit tubes. A WBC count and differential were determined from push-slide preparations. Plasma biochemical and hematologic abnormalities were as follows: hypoalbuminemia (0.2 g/dL; reference value, 1.8 ± 0.5 g/dL), low total protein concentration (0.9 g/dL; reference value, 4.5 ± 1.1 g/dL), hypocalcemia (7.1 mg/dL; reference value, 12.8 ± 3.0 mg/dL), hypophosphatemia (2.7 mg/dL; reference value, 4.8 ± 1.7 mg/dL), hypoglycemia (23 mg/dL; reference value, 76 ± 30 mg/dL), low Hct (13%; reference value, 28.7 ± 6.9%), and leukopenia (4.08 × 10^3 WBCs/µL; reference value, 12.95 ± 6.071 × 10^3 WBCs/µL). Whole-body survey radiography was performed (Figure 1).

Determine whether additional imaging studies are required, or make your diagnosis from Figure 1—then turn the page →

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A gastrointestinal tract contrast study was performed by oral administration of 2.3 mL of an ionic iodinated contrast agent via a gastric tube. Dorsoventral radiographic views were obtained immediately and at 15 minutes, 2 hours, 22 hours, and 144 hours after contrast agent administration (Figure 2).

The contrast agent outlines the esophagus, stomach, and proximal portion of the small intestine immediately after administration. By 2 hours, the proximal portion of the colon is evident. By 22 hours, the entire contrast column is confined to the transverse colon as a result of an obstruction (arrow). At 144 hours (D), the contrast agent has failed to move into the descending colon as a result of an obstruction (arrow). At 144 hours (D), the contrast agent has decreased opacity, compared with that at 22 hours (C), as a result of absorption of water by the hyperosmolar contrast agent.

Radiographic Imaging Findings and Interpretation

A gastrointestinal tract contrast study was performed by oral administration of 2.3 mL of an ionic iodinated contrast agent via a gastric tube. Dorsoventral radiographic views were obtained immediately and at 15 minutes, 2 hours, 22 hours, and 144 hours after contrast agent administration (Figure 2).

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Comments

An exploratory celiotomy was recommended; however, the owner requested euthanasia. On necropsy, a dilated loop of large intestine (transverse colon) occupying the caudal portion of the coelomic cavity was seen. The descending colon was devoid of contents and appeared atrophied. A constriction was identified between the transverse and descending portions of the colon. Luminal contents could not be advanced beyond the stricture. Ulcerative colitis with sclerosis, chronic coelomitis with adhesions, and coelomic granulomas were identified on histologic examination. Findings were considered secondary to colonic perforation from an ingested foreign body with subsequent stricture formation. Hypocalcemia, hypophosphatemia, and hypoglycemia were most likely the result of hypoalimentation.

In addition to a dorsoventral radiographic view, lateral and cranio-caudal views are recommended for complete radiographic evaluation of turtles. A horizontal beam technique is preferred because organs remain in their normal positions. If this is not possible, a vertical beam technique can be used by securing the turtle to a board to obtain a left-to-right lateral view. For a vertical cranio-caudal view, the turtle is positioned with the head pointing skyward.

Barium sulfate and water-soluble iodinated contrast agents have been used for radiographic contrast studies of the reptile digestive tract. Iodinated contrast agents have a substantially faster transit time than barium suspensions.

Red-eared slider turtles normally have a total transit time of 24 to 72 hours. Iodinated contrast agents reach the distal colon within 24 hours after administration and are particularly useful for evaluating gastrointestinal tract motility when obstructive lesions are suspected. When barium reaches the colon, it desiccates and inspissates as a result of absorption of water; consequently, it may remain in the colon for several weeks, making radiographic interpretation difficult. Iodinated contrast agents should be used when perforation of the intestine is suspected, particularly if surgery of the gastrointestinal tract is imminent.

a. Hypaque 50%, Nycomed Inc, Princeton, NJ.


Figure 2—Dorsoventral radiographic views of the same turtle as in Figure 1 after administration of contrast agent. A—Immediately after contrast administration, the esophagus (small arrow), stomach (large arrow), and small intestine (arrowhead) are evident. B—By 2 hours, the contrast agent has started to enter the colon (arrow). C—By 22 hours, the contrast agent has filled the dilated transverse colon (asterisks). D—By 144 hours, the contrast agent has failed to move into the descending colon as a result of an obstruction (arrow). At 144 hours (D), the contrast agent has decreased opacity, compared with that at 22 hours (C), as a result of absorption of water by the hyperosmolar contrast agent.