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What Is Your Diagnosis?

History

A 2-year-old 5.3-kg sexually intact male Miniature Schnauzer was referred for further evaluation of possible intravertebral disk herniation as an underlying cause of a 1-day history of sudden onset of signs of pain in the vertebral column or abdomen. One day earlier, the owners noticed that the dog had an unusual hunched position and became aggressive when picked up or touched on its abdomen. The owners had adopted the dog 1 month earlier and had no previous history for the dog other than it had a healed pelvic fracture from having been kicked by a horse and then underwent surgical repair.

On referral examination, the dog was bright, alert, and ambulatory but maintained a kyphotic posture when standing. All vital signs were within reference limits, and no abnormalities were found on thoracic auscultation. Abdominal palpation elicited signs of pain, and there was a soft tissue mass (approx 6 cm in diameter) in the left inguinal region. Rectal examination revealed mild stenosis of the pelvic canal with a hard protuberance palpable on the left side of the canal. Both testicles were descended; however, the right testicle was substantially smaller than the left. Neurologic examination revealed no additional abnormalities, and results of the orthopedic examination were within reference limits.

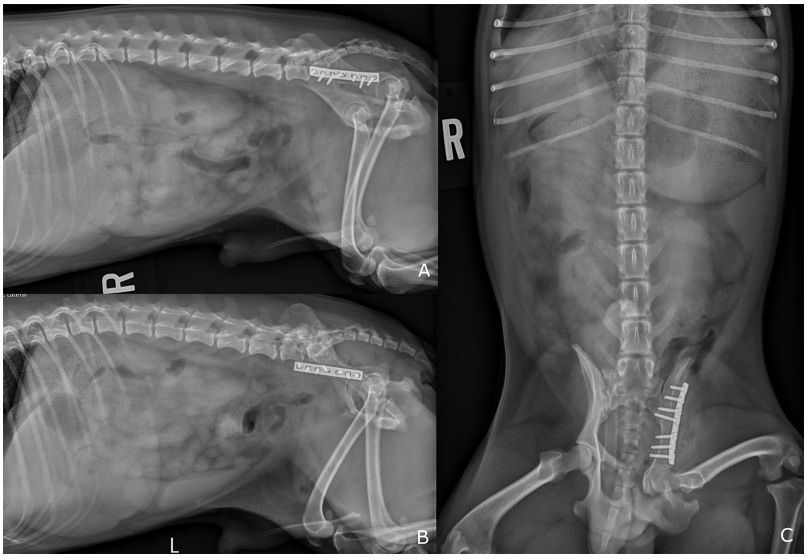

Figure 1—Right lateral (A), left lateral (B), and ventrodorsal (C) caudal abdominal and pelvic radiographic images of a 2-year-old 5.3-kg sexually intact male Miniature Schnauzer referred for further evaluation of possible intravertebral disk herniation as an underlying cause of a 1-day history of sudden onset of signs of pain in the vertebral column or abdomen.

Results of a CBC indicated moderate neutrophilia (20,384 neutrophils/µL; reference range, 3,000 to 11,500 neutrophils/µL). Serum biochemical analysis revealed mild hypokalemia (2.8 mmol/L; reference range, 3.3 to 4.6 mmol/L), hypermagnesemia (2.3 mg/dL; reference range, 1.7 to 2.1 mg/dL), and hypoproteinemia (5.4 g/dL; reference range, 5.7 to 7.8 g/dL). Urinalysis on a sample of urine obtained by cystocentesis revealed that the dog had inactive sediment and adequate urine-concentrating ability (urine specific gravity, 1.029). Three-view abdominal radiography was performed **(Figure 1)**.

Formulate differential diagnoses, then continue reading.

Diagnostic Findings and Interpretation

Abdominal radiography revealed a mixed gas and soft tissue opacity thickening in the left inguinal region; a surgically repaired and healed fracture of the left ilium with an orthopedic plate and 7 screws in place, and several nonunion fractures of the pubis and left ischium extending into the left acetabulum **(Figure 2)**. In all images, the prepubic tendon appeared intact.

Abdominal ultrasonography revealed that the left inguinal area had a rent in the body wall through which a loop of small intestine protruded into the subcutaneous tissue **(Figure 3)**. The herniated loop of small intestine had thickened and irregular wall architecture, and blood flow within the herniated portion was confirmed with color-flow Doppler ultrasonography (not shown). The surrounding mesentery was hyperechoic, and there was a small volume of free fluid surrounding the herniated loop of small intestine. Scant peritoneal effusion in the splenic and hepatic region was also identified. Ultrasonography of the testicles (not shown) revealed typical echogenicity and echotexture bilaterally and supported our earlier finding that the right testicle was substantially smaller than the left.

Given our findings, we diagnosed body wall herniation with incarceration and possible early strangulation of the small intestine, all of which could have been sequelae of trauma received when the dog was kicked by a horse.

Treatment and Outcome

An emergency exploratory celiotomy was performed and revealed a 2-cm-diameter defect in the body wall at the level of the prepubic tendon, tremendous amount of adhesions that had prevented the return of the strangulated intestines into the abdomen, and severely congest-

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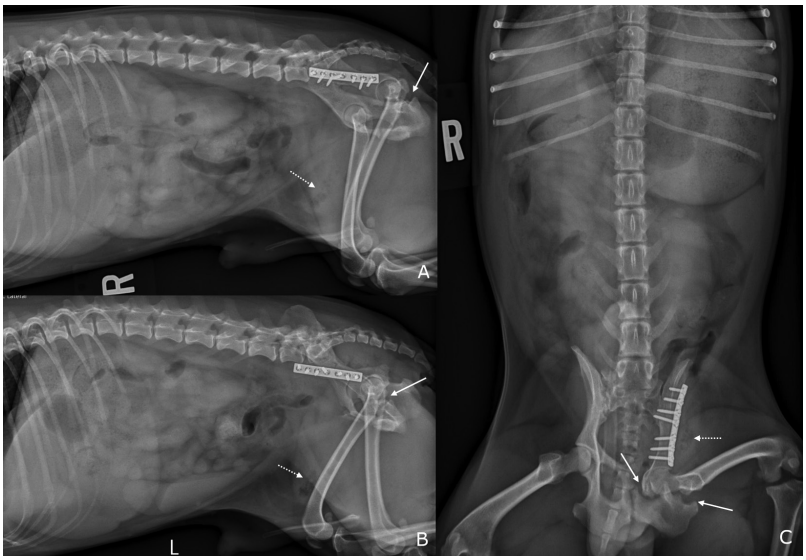

Figure 2—Same images as in Figure 1. There are gas opacities surrounded by a soft tissue opacity (dotted arrows) in the left inguinal area. Also evident are an orthopedic plate and screws affixed to the left ilium, multiple nonunion fractures of the pubis and left ischium that extend into the left acetabulum (solid arrows). The prepubic tendon appears intact.

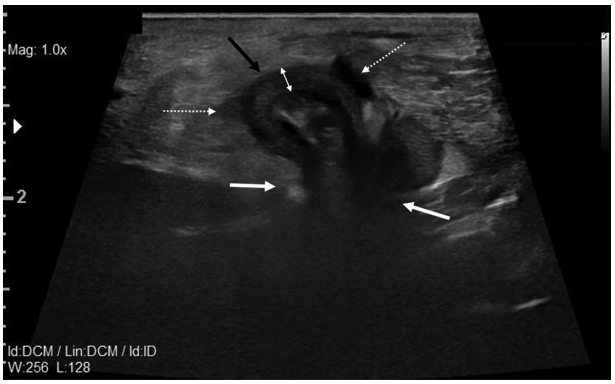

Figure 3—Ultrasonographic image of the soft tissue mass in the left inguinal area of the dog described in Figure 1. There is a rent (approx 2 cm diameter; white solid arrows) in the body wall in the left inguinal region through which a distal segment of the small intestine (black arrow) protrudes into the surrounding subcutaneous tissue. This herniated loop of small intestine has thickened and irregular wall architecture (double-headed arrow). A small volume of free fluid (white dotted arrows) is adjacent to the herniated loop of intestine. The scale along the left of the image is in centimeters.

ed and herniated jejunum that was dark purple to black and lacked peristalsis. Once the adhesions were broken down and the abdominal wall was incised to allow the return of the jejunum, resection and anastomosis of the incarcerated distal portion of jejunum were performed, then the prepubic tendon rupture was repaired. After abdominal closure, a closed castration was performed. The dog recovered without complication as was discharged 2 days after surgery. Histologic examination of the dog's testicles confirmed hypoplasia of the right testicle.

Comments

Prepubic tendon rupture with resulting ventral abdominal body wall herniation is an uncommon occurrence in dogs, and a primary cause is blunt trauma to the caudal aspect of the abdomen, which usually involves vehicular trauma but can also involve dog-bite injuries and kicks from large animals.[1] Abdominal radiography is very useful in evaluating for abnormalities, such as body wall rents and organ incarceration, in veterinary patients with trauma.[1,2] Many dogs and cats with traumatic body wall hernias have additional soft tissue and orthopedic injuries.[1,3] Diagnosis of traumatic body wall herniation can be complicated in animals evaluated before abdominal contents have become incarcerated.[4]

For the dog of the present report, the limited history combined with its previous orthopedic injury and repair contributed to the difficulty in diagnosing the underlying cause for its sudden onset of signs of pain. The referring veterinarian had suspected possible intravertebral disk herniation; however, our physical examination finding of a soft tissue mass in the left inguinal region coupled with radiographic findings of a gas-filled soft tissue opacity in the same area suggested an abdominal cause of pain. Our initial differential diagnoses included a herniated loop of intestine, abscess formation, subcutaneous emphysema, or gangrenous necrosis of subcutaneous tissue. The dog's history of pelvic trauma and the extent of it evident radiographically further prioritized body wall hernia. Thus, we performed abdominal ultrasonography to further characterize the gas opacity in the inguinal region. With ultrasonography, we visualized a rent in the dog's body wall and incarceration of a distal loop of intestine. The dog's sudden onset of signs of pain were likely related to some degree of strangulation or obstruction of the incarcerated small intestine. Interestingly, the prepubic tendon appeared intact on all radiographic projections but was determined during surgery to have been ruptured; thus, it too was repaired.

Diagnostic imaging of the dog of the present report provided immediate, invaluable information regarding the dog's severely compromised intestine and the underlying cause of signs of pain. These findings allowed us to promptly make a clinical diagnosis and move forward with surgical treatment.

References

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