Testicular seminoma associated with torsion of the spermatic cord in two cryptorchid stallions

Robert J. Hunt, DVM; William Hay, DVM; Chrysanne Collatos, DVM; Elizabeth Welles, DVM

Cryptorchidism is a common condition in the horse. Dogs, human beings, and horses with cryptorchid testes have an increased risk of developing testicular neoplasms.¹-⁶ In dogs and human beings, spermatic cord torsion is a reported complication of retained neoplastic testis.⁵,⁷ Two adult horses with colic had spermatic cord torsion and strangulation of abdominally retained neoplastic testes. Case 1—A 17-year-old Tennessee Walking horse stallion was examined because of a 6-hour history of signs of moderate to severe abdominal pain; the horse transiently responded to analgesics. The referring veterinarian had been unable to palpate the left testis in the scrotal sac. Palpation per rectum had revealed a “firm, sausage-shaped” mass, adjacent to the internal inguinal ring. Gastric reflex had not been obtained after nasogastric intubation. The signs of pain returned shortly afterward, and the horse was referred to our hospital.

Physical examination on admission revealed a normal temperature (38°C), tachycardia (80 beats/min), and tachypnea (32 breaths/min). The mucous membranes were pale pink with a toxic gingival line; capillary refill time was 2.5 seconds. Gastric reflux was not obtained after nasogastric intubation. On palpation of the external genitalia, a normal right testis was palpable in the scrotal sac; however, the left testis was not palpable. Palpation per rectum revealed a smooth-surfaced, firm, but compressible, soft tissue mass approximately 15 cm in diameter and of an indeterminable length located in the caudal left quadrant of the abdomen ventral to the brim of the pelvis. The left inguinal ring could not be identified. Traction on the mass elicited signs of pain.

Abnormal laboratory values consisted of slightly increased values for PCV (44%) and plasma protein concentration (7.5 g/dl). The leukogram and arterial blood gas values were normal. Serum creatinine, TCO₂, anion gap, and electrolytes were normal. Abdominal paracentesis yielded a sero-sanguineous fluid with 5,400 wbc/µl and 4.4 g of protein/dl.

The decision to perform an exploratory celiotomy was based on the abnormal findings on palpation per rectum, color and protein concentration of the peritoneal fluid, and persistence of signs of pain. The stallion was anesthetized with xylazine (1.1 mg/kg of body weight, iv) and ketamine (2.2 mg/kg, iv) and was positioned in dorsal recumbency. Anesthesia was maintained with halothane in oxygen, using a semiclosed circle system. Abdominal exploration via a ventral midline approach revealed a large abdominal testis, epididymis, and spermatic cord involved in a 360° clockwise torsion of the spermatic cord. Following correction of the torsion, the abdominal incision was extended caudally in a parapreputial manner to allow exteriorization of the testis, epididymis, and spermatic cord. The testis was edematous and dark red to purple. The site of the torsion, approximately 8 to 10 cm distal to the attachment of the dorsal body wall, was smaller and well delineated. Gentle traction on the testis, dissection of the mesorchium, and dorsal pressure on the edges of the abdominal incision allowed adequate exposure for ligature placement on the spermatic cord and ductus deferens proximal to the site of the torsion. The involved structures were removed. Palpation revealed no further abnormalities. The abdomen was closed using a routine 3-layer closure. After surgery, the horse was given potassium penicillin-G (22 × 10⁳ IU/kg, iv, q 6 h), gentamicin sulfate (2.2 mg/kg, iv, q 8 h), and flunixin meglumine (1 mg/ kg, iv, q 12 h) for 3 days. Maintenance balanced polyionic fluids were administered iv for the first 48 hours after surgery. The horse had no complications after surgery and was discharged 5 days later. The owners reported the horse to be in good health 2 months after surgery.

The testis was 14 × 10 × 10 cm. On longitudinal section, 3 well circumscribed 6-cm-diameter white homogenous areas were within the parenchyma of the testis. Histologic examination of several sections of testicular tissue revealed tubular structures and cords of cells palisading from trabeculae of fibrovascular stroma. The cells were

From the Departments of Large Animal Medicine (Hunt, Hay, Collatos), and Pathology (Welles), College of Veterinary Medicine, The University of Georgia, Athens, GA 30602.
rounded and had large rounded nuclei and basophilic cytoplasm (Fig 1). The cells toward the center of the tubules were smaller with a more condensed nuclei. Multifocal areas of degeneration and necrosis were found, as were irregular areas of fibrosis, congestion, and hemorrhage. Multifocal areas of congestion and hemorrhage were evident in the ductus deferens. These findings were consistent with testicular seminoma and a vascular strangulating lesion.

**Case 2**—A 14-year-old crossbred gelding was admitted to the hospital with a 4-day history of moderate signs of abdominal pain. Treatment prior to referral had consisted of oral and intravenous administration of fluids and administration of flunixin meglumine and phenylbutazone, but the horse’s condition had failed to improve.

On admission, the horse had a normal rectal temperature (37°C), slight tachycardia (48 beats/min), and slight tachypnea (20 breaths/min). The mucous membranes were pink, and the capillary refill time was 2.0 seconds. Reflux was not obtained by nasogastric intubation. Palpation per rectum revealed a firm tubular mass in the right caudodorsal quadrant of the abdomen, which extended cranioventrally.

Results of a CBC, and serum electrolyte values, TCO₂, and anion gap were within normal limits. Serum creatinine was slightly high (2.1 g/dl). Abdominal paracentesis yielded a sanguinous fluid with 15,400 WBC/μl, 5.5 g of protein/dl, and a PCV of 30%.

Transabdominal ultrasonography was performed to further delineate the mass. The mass was homogeneous, approximately 15 cm in diameter, and extended cranioventral to the level of the umbilicus.

Thirty-six hours after admission, the horse had signs of increased abdominal pain, but responded favorably to treatment with xylazine (0.5 mg/kg, iv), butorphanol (0.025 mg/kg, iv), and dipyrone (10 mg/kg, iv). Because of economic limitations, the owners declined further treatment and requested that the horse be euthanatized. Necropsy revealed a large right testis in the abdominal cavity. The testis had a lobulated, dark-purple surface and was approximately 16 cm in diameter. A 360° spermatic cord torsion was located 3 cm caudal to the attachment of the spermatic cord to the dorsal body wall. The spermatic cord distal to the torsion was dark purple and edematous. On cross-section, the testis contained a 4-cm-diameter homogeneous tan area surrounded by dark-red necrotic tissue.

Histologic examination of the testis revealed a solid sheet of large discrete neoplastic cells. The cells had round vesicular nuclei, prominent large nucleoli, and abundant eosinophilic cytoplasm. Moderate anisokaryosis with large nuclei was evident. Multinucleated cells and mitotic figures were numerous. The stalk of the testis consisted of large blood-filled vessels separated by a hemorrhagic necrotic seroma. The histopathologic diagnosis was testicular seminoma and a vascular strangulating lesion.

Testicular seminoma is the most common testicular tumor in the horse and, as in other species, there appears to be a higher prevalence in cryptorchid animals. Although no gross evidence of metastasis was evident in either of these horses, malignant seminomas are known to spread to regional lymph nodes, the contralateral testis, abdominal viscera, and thoracic organs. Consequently, these cases carry a guarded prognosis.

Torsion of the spermatic cord has been reported in people, pigs, and dogs. Spermatic cord torsion has been reported in horses and is thought to have been associated with an elongated ligament

![Figure 1 — Photomicrograph of a section of the testis from a horse (case 1) with testicular seminoma. Notice large rounded and polygonal cells with fasicular nuclei and abundant cytoplasm. H&E stain; bar = 100 μm.](image-url)
of the tail of the epididymis and proper ligament of the testis. However, to our knowledge, spermatic cord torsion has not been reported to develop in horses with abdominally retained testes. In one study, torsion of the spermatic cord of dogs appeared to be a sequel to neoplastic enlargement of a retained testis.

Spermatic cord torsion of an abdominally retained testis should be considered in the differential diagnosis of signs of abdominal pain in cryptorchid stallions, especially those with a palpable caudal abdominal mass. If suspected, special preparatory measures, including surgical preparation of the caudal portion of the abdomen and paraphreputial areas for a caudal abdominal incision, should be performed to allow adequate exposure of the affected structure.


---

**Book Review:**

**Skin Diseases of Cattle**

This paperback text is limited to bovine dermatology. It is well organized and presented in a format that is easy to read. The strongest chapters concern chemical and plant poisoning; the agent and the toxic component are discussed. Throughout the book, therapeutic agents are listed for each disease. A pharmaceutical index lists each drug, with additional information such as dosage, size availability, precautions, and withholding times. This format is awkward, but does decrease unnecessary duplication. A series of color plates are located in the front of the book.

In addition to the author’s experience, a list of several texts and journals were used as resource material. No specific references are listed in the text. The absence of a reference list is frustrating when controversial statements are presented. In some areas, the coverage of specific diseases is superficial. There is no mention of the zoonotic potential of diseases.

The text could be improved by an increased number of illustrations and the inclusion of specific references. Overall, it is a useful addition to the large animal practitioner’s or veterinary dermatologist’s library—[Skin Diseases of Cattle. Veterinary Review No. 29. By D. I. Bryden. 154 pages; illustrated; softcover. Published by Post Graduate Foundation in Veterinary Science, Sydney, Australia. 1989. Order from Director, Post Graduate Committee in Veterinary Science, PO Box A561, Sydney South, NSW 2000, Australia. Price (Australia funds) $20.00 surface mail; $23.00 surface air lifted.]—DONNA W. ANGARANO