History

A 5-year-old Arabian stallion was presented for signs of severe colic observed by the owners and referring veterinarian. The physical examination performed by the referring veterinarian was found to be unremarkable with the exception of a mildly enlarged left testicle that felt firm and cool to the touch. The horse was treated with flunixin meglumine (1.1 mg/kg, IV) and was referred for further evaluation.

Upon presentation to the referral hospital, clinical evaluation revealed the animal was no longer demonstrating signs of colic. Heart and respiratory rates were 48 beats/min (reference range, 28 to 48 beats/min) and 16 breaths/min (reference range, 8 to 16 breaths/min). Mucosae appeared pink and moist, and capillary refill time was 1.5 seconds. The animal was afebrile. Point-of-care lab work revealed a PCV of 35% (reference range, 30% to 46%), a plasma total protein concentration of 6.7 g/dL (reference range, 5.8 to 8.7 g/dL), and a peripheral lactate concentration of 0.9 mmol/L (reference range, 0.9 to 2.0 mmol/L). The left testicle was mildly larger than the right and was firm, cool, and nonpainful on palpation.

Formulate differential diagnoses, then continue reading.

Diagnosis

Palpation of the scrotal contents on the affected side revealed that the head and tail of the epididymis were in the appropriate orientation. Transrectal palpation of the horse revealed subjective mild enlargement of the left spermatic cord in the region of the left inguinal ring compared with the right spermatic cord at the same level. Ultrasound examination of the scrotal region revealed mild enlargement of the spermatic cord and some irregular, heterogeneous echogenicity in the testicular parenchyma (Figure 1). Based on these findings, spermatic cord torsion was suspected, but due to the cessation of colic signs, other testicular abnormalities were considered possible. Given the variety of potential diagnoses, the horse was hospitalized for observation and serial examinations with ultrasonographic monitoring of the left testicle. For the subsequent 36 hours, no changes in the stallion’s condition were appreciated. The horse remained comfortable and systemically stable with no signs of colic. The horse also maintained a good appetite for small amounts of hay and passed clinically normal manure. After 36 hours, repeat ultrasound examination of the testicular parenchyma...
revealed increasingly irregular echogenicity. The horse also developed diffuse scrotal edema (Figure 2). Doppler ultrasonography of the spermatic cord revealed a substantial reduction in the blood flow of the left spermatic cord compared with the contralateral side (Supplementary Video S1). Additionally, the diameter of the left spermatic cord was approximately twice the diameter of the right spermatic cord (Figure 3). The increased size of the left testicle, worsening scrotal edema, increasing heterogeneous echogenicity of the testicle on ultrasound, and decreased blood flow in the spermatic cord confirmed a diagnosis of a 360° spermatic cord torsion.

Treatment and Outcome

Following the 36-hour examination period, the horse was prepared for hemicastration with primary closure. The horse was treated with preoperative gentamicin (6.6 mg/kg, IV), procaine penicillin (22,000 IU/kg, IM), flunixin meglumine (1.1 mg/kg, IV), and a tetanus toxoid. Following induction of general anesthesia, the horse was prepared for sterile castration, and upon exteriorization of the testicle from the vaginal tunic a 360° spermatic cord torsion was identified (Figure 4). A primary closure hemicastration was performed, and the testicle was submitted for histopathologic examination, where ischemic (coagulative) necrosis was identified in both the testicular parenchyma and spermatic cord. Surgery and recovery from anesthesia were unremarkable. No complications were encountered in the postoperative period. The horse remained hospitalized for 3 additional days and was discharged to the care of the farm with instructions for restricted exercise for 2 weeks, a tapering dose of a nonsteroidal anti-inflammatory (flunixin meglumine; 0.55 mg/kg, PO, q 12 h, for 3 days and then q 24 h for 3 days) for 6 days, and 10 additional days of antibiotic therapy (trimethoprim sulfamethoxazole; 24 mg/kg, PO, q 12 h).

Discussion

Spermatic cord torsions of 360° or more are an emergency, as they compromise the vascular supply to the affected testes, leading to ischemia causing scrotal swelling and pain. This pain can initially be interpreted as gastrointestinal colic, and this
differential diagnosis should be ruled out with a complete colic examination. However, it is reported that the pain can subside following spermatic cord torsion, and this is thought to occur once vascular compromise has led to ischemic necrosis. Similar to these reports, the current case was found to be acutely painful, and within a few hours the pain had subsided and the stallion was found to be systemically normal. However, the scrotal edema increased during the period of hospitalization. This case highlights that colic signs and pain can subside when ≥ 360° torsions of the spermatic cord occur and that pain is not a reliable indicator in diagnosing this condition. Progressive swelling of the scrotal region and serial ultrasound examinations to identify changes in the echogenicity of the testicular parenchyma and blood flow were more useful indicators of a ≥ 360° torsion of the spermatic cord.

Given the possible differential diagnoses in a horse with unilateral scrotal enlargement, a thorough examination and additional diagnostics may be necessary to achieve an accurate diagnosis. Palpation is important to determine the position of the head and tail of the epididymis. Cases of torsions at 90° or 180° will have an abnormal position of the tail of the epididymis, but cases of torsions at 360° will have the tail of the epididymis located in the caudolateral aspect of the scrotum. Rectal examination to rule out gastrointestinal pathology and identify possible enlargement of the spermatic cord in the region of the inguinal ring should be performed. Finally, ultrasonographic examination of both the testicular parenchyma and spermatic cord using B-mode and Doppler ultrasonography are important diagnostics. Initially, in the early stages ultrasound examination may be unremarkable, but the appearance of the testicular parenchyma will quickly develop an abnormal, heterogenous echotexture as a result of the venous congestion and edema secondary to obstruction of the spermatic cord. The spermatic cord itself will also rapidly develop edema and an increased cross-sectional area. Doppler ultrasonography of the spermatic cord and testes may reveal decreased blood flow in both the spermatic cord and testis. Comparison of blood flow and overall architecture of both the spermatic cord and testicular parenchyma between the affected and unaffected testes is particularly useful in making the diagnosis.

Treatment of spermatic cord torsion that has compromised blood supply to the testicle is castration. Hemicastration can be performed to preserve breeding potential, or bilateral orchiectomy can be performed in nonbreeding animals. Reports exist in other species of an autoimmune response, secondary to necrosis of testicular parenchyma, producing antisperm antibodies that cause cellular injury to the contralateral testis, resulting in cellular damage and possibly sterility. However, this has not been documented in horses. Regardless, prompt hemicastration is important in stallions with value as breeding animals. In cases where there has not been substantial compromise to the testicular parenchyma, detorsion of the affected testicle and orchiopexy has been successfully performed. Finally, cases with unilateral spermatic cord torsion may be at risk for subsequent torsions in the contralateral spermatic cord, and communication of this risk to owners should occur.

Reports of 360° spermatic cord torsions are rare in the veterinary literature, and in most of these cases colic signs and testicular enlargement were reported. The stallion described here initially displayed signs of colic but rapidly became comfortable and systemically stable, making diagnosis of spermatic cord torsion challenging. This case also highlights the importance of both B-mode and Doppler ultrasonography in making the diagnosis of spermatic cord torsion. Extralabel drug use was performed with owner consent and complied with provisions of AMDUCA and 21 CFR 553.

Outcome
The stallion recovered from unilateral primary closure hemicastration without complications. A follow-up reproductive examination of the right testicle has not been performed, and the stallion returned to previous use but has not been bred.

Acknowledgments
The authors have nothing to declare. This case was presented as an abstract at the Society for Theriogenology.

References

Supplementary Materials
Supplementary materials are posted online at the journal website: avmajournals.avma.org