History

A 4-year-old Quarter Horse gelding was referred to the Mississippi State University Veterinary Teaching Hospital because of a 2-week history of lethargy, signs of depression, poor appetite, intermittent fever (38.94° to 40°C [102.1° to 104.0°F]), and acute weight loss. A cardiac murmur had been initially detected by the referring veterinarian. Results of initial CBC and serum biochemical analysis were within reference limits. The horse was unvaccinated. Treatment included administration of antimicrobials and NSAIDs. There was little to no clinical improvement, and recheck CBC revealed leukocytosis (19,100 WBCs/µL; reference range, 5,500 to 12,500 WBCs/µL) with neutrophilia (15,600 neutrophils/µL; reference range, 2,600 to 7,500 neutrophils/µL) and monocytosis (1,500 monocytes/µL; reference range, 0 to 1,000 monocytes/µL). Antimicrobial treatment was empirically changed, and the horse was referred for further diagnostic testing.

At the time of referral, all vital signs were within reference limits. The horse was estimated to be approximately 90 kg (200 lb) underweight (body condition score, 3/9). Mild synovial effusion was detected in the carpal and tarsal joints and all digital flexor sheaths. A coarse, grade 4 of 6 systolic, crescendo murmur was auscultated with a point of maximum intensity over the mitral valve area. No dysrhythmias or overt signs of congestive heart failure were evident. Echocardiographic images of the heart were obtained (Figure 1).

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

This report was submitted by Jacquelyn E. Bowser, DVM; Matthew K. Woodington, DVM; and Jacquelin J. Boggs, DVM, MS, DACVIM, from Equine Internal Medicine, College of Veterinary Medicine, Mississippi State University, Mississippi State, MS 39762 (Bowser, Boggs); and Woodington Veterinary Services, 332 W State St, Eagle, ID 83616 (Woodington). Dr. Boggs’ present address is Pfizer Animal Health, 5 Giralda Farms, Madison, NJ 07940.

Address correspondence to Dr. Bowser (bowser@cvm.msstate.edu).
Diagnostic Imaging Findings and Interpretation

On B-mode (2-D) echocardiography, multiple, irregularly marginated, echogenic lesions on both mitral valve leaflets are apparent (Figure 2). The largest of these lesions was found on the septal leaflet and measured approximately 4.7 cm in length (Figure 3). This mass moved freely between the left ventricular and atrial chambers, with the movement of the mitral valve during the cardiac cycle. Color flow Doppler echocardiography was performed and confirmed a small jet of regurgitation into the left atrium during systole. Fractional shortening was increased (43%; reference range, 26% to 43.5%), but all wall thicknesses and cardiac chamber diameter measurements were within reference limits. On the basis of these findings, a diagnosis of vegetative valvular endocarditis of the mitral valve with compensation of left ventricular function was made.

Treatment and Outcome

Results of aerobic and anaerobic bacterial culture of blood samples were negative; there had been a 72-hour antimicrobial washout period prior to blood sample collection. Administration of antimicrobials and NSAIDs was continued, and administration of antithrombotics was initiated, with a CBC repeated every 7 to 14 days. Antimicrobial treatment was discontinued at 40 days because of resolution of clinical signs and CBC values within reference limits. Antithrombotic treatment was continued. The horse was clinically normal with good body condition; at 32 months after hospital discharge, the horse was in training for barrel racing competition.

Comments

Bacterial endocarditis in horses is rare,1–3 with 2 forms distinguished by clinical manifestation: an acute form and a subacute or chronic form. The acute form is characterized by rapid development of signs of cardiac insufficiency (ventral and distal limb edema and jugular pulses). The subacute or chronic form is more common, and clinical signs include intermittent pyrexia, weight loss, shifting lameness, poor performance, and lethargy with1–3 or without1–3 cardiac murmur. In the chronic form, clinical signs may last for weeks to months, with the risk of cardiac failure occurring ter-
minally. No breed or sex predilection is recognized for bacterial endocarditis. Young horses (age, 2 to 5 years) are at increased risk, and this is thought to be due to an increased incidence of bacteremia in younger animals. It is hypothesized that a primary viral infection can predispose cardiac valve leaflets to bacterial colonization, and the unvaccinated status of this horse may have led to increased risk. Bacteria most commonly associated with endocarditis are *Pasteurella*, *Actinobacillus*, and *Streptococcus* spp and less commonly *Escherichia coli*, *Corynebacterium* spp, *Pseudomonas* spp, *Bacillus* spp, *Erysipelothrix rhusiopathiae*, and *Borrelia burgdorferi*. Antemortem bacterial culture of blood samples, when attempted, is not always successful in identifying an etiologic agent. Echocardiography is the most specific and sensitive imaging modality available for diagnosis of bacterial endocarditis. Echocardiography provides accurate diagnosis via detection of location and size of valvular lesions. This modality can aid in formulating prognosis through visualization of chamber enlargement, severity of regurgitant jet, and extent of myocardial dysfunction and identification of concurrent pathological changes such as ruptured chordate tendineae or interchamber cardiac fistula or perforation. Serial assessments can evaluate response to treatment and help guide duration of treatment.

The mitral valve, aortic valve, or both are most commonly involved. Tricuspid or pulmonic valve endocarditis is less common but carries a somewhat better prognosis. Prognosis for athletic performance and long-term survival is poor to grave because of irreversible changes to hemodynamic flow from the damaged valves leading to cardiac failure, even after sterilization of the lesion.