

Bone Marrow Aspiration: Sternum, Humerus, or Ilium?

This study investigated the feasibility, ease, and sample quality of sternal (vs humerus and ilium) bone marrow aspiration to determine whether sternal bone marrow aspiration can be performed safely under general anesthesia with comparable quality samples. Included were 26 clinically normal, young- to middle-aged, purpose-bred beagles with normal hemograms.

Aspirates taken from the first sternebra, ilium, and humerus of each dog were evaluated for cellular composition and scored for overall quality. The sternum proved to be the easiest site to aspirate, likely because of a thinner cortex, but required more attempts than humerus aspiration. This discrepancy may have related to operator experience, as attempts decreased over time. It was also difficult to maintain dogs in the sternal position under complete anesthesia, indicating that minimal sedation may be more appropriate and desirable for both patient positioning and safety in geriatric or debilitated dogs. Quality scores from all sites were similar and fell

within reference limits for hematologically normal dogs. After the procedure, no evidence of laceration of the thoracic cavity was found in any dog's necropsy. Sternal bone marrow aspiration was found to be feasible, safe, and of similar quality to iliac and humeral bone marrow aspirations.

■ Commentary

Bone marrow sampling can be challenging, particularly in older dogs with reduced hematopoiesis in long bones. This study demonstrated that the sternum may be an alternative, specialized collection needles may not be needed, and that regular hypodermic needles can help obtain adequate diagnostic bone marrow samples for cytologic evaluation when using the described technique. A bone marrow *biopsy* sample may not be obtained safely from the sternum, so a comprehensive bone marrow evaluation may require additional sampling elsewhere. Also, this technique may require more attempts and take more time than collecting samples from the humerus. Maintaining the position of a medium-to-

large anesthetized dog may be challenging for sternal bone marrow sample, and there is a small risk for cardiac tamponade described in humans with sternal bone marrow collection and should be considered a risk in dogs. This technique was evaluated in clinically normal beagles, so it is unknown if sternal bone marrow collection offers additional advantages over other sites in dogs with hematopoietic disease. Specialized bone marrow collection needles may be less traumatic and painful than hypodermic needles.—*Elke Rudloff, DVM, DACVECC*

■ ■ Source

Comparison of sternal, iliac, and humeral bone marrow aspiration in beagle dogs. Defarges A, Abrams-Ogg A, Foster RA, Bienziele D. *Vet Clin Pathol* 42:170-176, 2013.

RESEARCH NOTE: Potential Use of Atorvastatin in Dogs

Atorvastatin, commonly prescribed in humans, is associated with benefits beyond cholesterol-lowering effects. Increased systemic inflammation is a feature of congestive heart failure (CHF), and statins have antiinflammatory and cardioprotective effects. This study evaluated the tolerability of atorvastatin and short-term clinical benefits for dogs with CHF. In phase one, 11 healthy dogs were given atorvastatin at 0.5 mg/kg q24h for 2 weeks, then 2 mg/kg q24h for the next 2 weeks. CBC, serum biochemistry panel, and C-reactive protein (CRP) concentrations were measured at baseline and at 2 and 4 weeks. In phase 2, 12 client-owned dogs with stable CHF were treated with atorvastatin at 2 mg/kg q24h for 8 weeks. CHF dogs were monitored via echocardiography, CBC, serum biochemistry panel, blood pressure (BP), and quality-of-life assessment. Results showed that atorvastatin was well tolerated in both groups and was neither associated with

changes in liver enzymes nor with owner-reported effects. A decrease in total serum cholesterol was noted at the 2 mg/kg dose but not at the lower dose. Dogs with CHF had significant decreases in systolic BP, total cholesterol, and low-density lipoprotein levels as well as decreases in total WBC and segmented neutrophil counts, indicating a decrease in systemic inflammatory response over the 8-week treatment. No significant change in CRP level was noted. Atorvastatin is well tolerated and may have beneficial effects, including a decrease in systemic inflammation, in dogs with CHF. Further study with larger sample sizes is warranted.

■ ■ Source

Short-term effects of atorvastatin in normal dogs and dogs with congestive heart failure due to myxomatous mitral valve disease. Cunningham SM, Rush JE, Freeman LM. *JVIM* 27:985-989, 2013.

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