Clinical Technique: Extra-articular Surgical Stifle Stabilization of an American Bullfrog (*Rana catesbeiana*)

William Van Bonn, DVM

Abstract

Reports of orthopedic surgical procedures in anuran (frogs and toads) patients are rare. The plight of many anuran populations and the increased role of clinical veterinarians in aquatic conservation, zoological, and biomedical research management will result in more frogs and toads being cared for as individuals to include orthopedic surgical support. The technique described in this article was used to successfully correct an acute, presumed traumatic, stifle instability in a wild-caught American Bullfrog (*Rana catesbeiana*) and is shared to encourage clinicians to further adapt surgical techniques when caring for these important animals. © 2009 Published by Elsevier Inc.

Key words: **anuran; frog; veterinary surgery; veterinary orthopedics; stifle**

A 257-g adult male American Bullfrog (*Rana catesbeiana*) presented to the Animal Health Department of the John G. Shedd Aquarium for evaluation of left hindlimb lameness. The frog was wild caught 1 month before along with another male and a female of the same species. All animals were housed in an isolated quarantine system with recirculating, dechlorinated fresh water and supplemental ultraviolet lighting, and were fed crickets gut-loaded with vitamin and mineral supplement on a daily basis. Natural rock was used to provide basking sites, and half sections of polyvinylchloride pipe were available that provided individual hiding areas.

On presentation, the frog was bright, alert, and responsive. The left hindlimb extensor and flexor muscle groups were markedly atrophic, and the stifle joint was unstable. At rest, in flexion, the limb distal to the stifle showed a marked valgus deviation. There was also an angular deformity to the distal interphalangeal joint of digit 3 of the right forelimb. No other abnormal findings were detected on physical examination. Radiographs confirmed the angular deformities noted on physical examination and demonstrated a significant displacement of the tibia-fibula at the stifle joint (Fig 1).

A preanesthetic dose of fentanyl citrate (0.5 mg/kg) was administered by injection into the dorsal lymph sac, and a dose of ceftazidime (25 mg/kg intramuscularly, Fortaz; GlaxoSmithKline, Research Triangle Park, NC USA) was administered immediately preoperatively. The frog was anesthetized with a topical liquid isoflurane/water/sterile lubricant mixture followed by immersion in 400 parts per million (ppm) tricaine methanesulfonate (MS-222) (FINQUEL; Argent Chemical Laboratories, Inc., Redmond, WA USA) in exhibit water buffered with sodium bicarbonate (Fig 2). Anesthesia was maintained by recir-

From the John G. Shedd Aquarium, Chicago, IL USA.

Address correspondence to: William Van Bonn, DVM, Senior Director for Animal Health, John G. Shedd Aquarium, 1200 South Lake Shore Dr, Chicago, IL 60605. E-mail: bvanbonn@sheddaquarium.org.

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Fig 1. Dorsoventral radiograph of American Bullfrog with left stifle instability at physical examination.

culation of 200 ppm MS-222 in exhibit water followed by exhibit water alone over the skin (Fig 3). The animal was placed in dorsal recumbency, and the left hindlimb was aseptically prepared for surgery by placing a piece of gauze soaked with dilute chlorhexidine (0.75%, Nolvasan; Fort Dodge Animal Health, Fort Dodge, IA USA) for approximately 3

Fig 2. Induction of anesthesia in American Bullfrog with left stifle instability.

Fig 3. American Bullfrog in dorsal recumbency. Anesthesia is being delivered by recirculation tube in anesthetist's right hand.

minutes of contact time over the incision site. To facilitate hemostasis, a 1/2-inch sterile Penrose drain was wrapped under pressure from distal to proximal on the limb to the hip and removed after placing a Penrose tourniquet at the hip insertion. The entire limb was then passed through a sterile fenestrated drape (Fig 4). A curvilinear skin incision was made

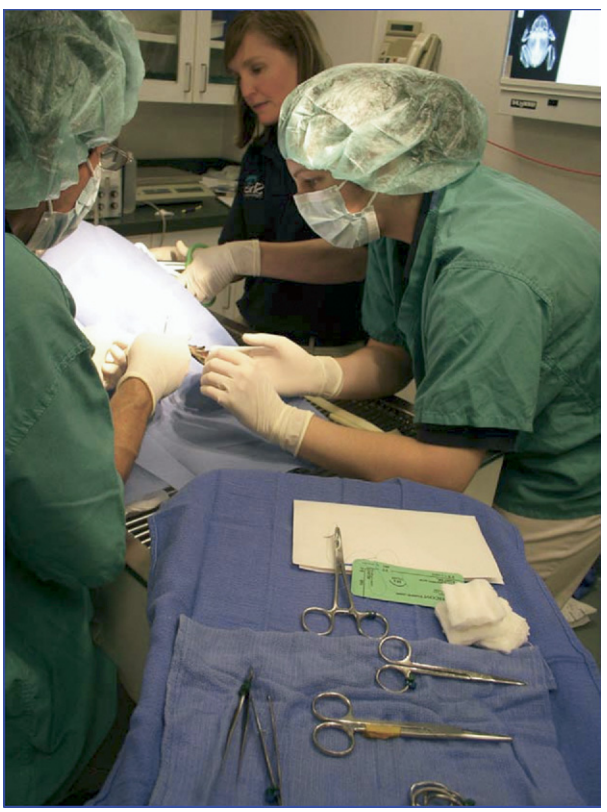

Fig 4. Surgical field during stabilization of stifle in American bullfrog.