

WHEN THE SPRING IN HIS STEP HAS SPRUNG!

Courtney Fitzpatrick, DVM, Diplomate, American College of Veterinary Surgeons



Figure 1:
Right PCA, immediately post-operative (left) and at 4 months post-op. (right).



Figure 2:
Left PCA, immediately post-operative (left) and at 4 months post-op. (right).



Figure 3:
Otto in his custom carpal braces, at 2 months post-op. PCA.



Figure 4:
Otto at 6 months post-operative PCA.

Hyperextension of the carpus is a common and serious injury, usually arising from a fall or jump that results in damage to the supporting palmar ligaments and fibrocartilage. This case illustrates surgical treatment in a dog that was bilaterally affected.

History:

Otto, a 1-year-old M/N Husky mix, fell off a roof while doing training exercises and was diagnosed with bilateral carpal hyperextension injuries. The hyperextension injuries were treated for two months in splints but the hyperextension did not improve and Otto remained painful, so he was referred to VSRC. On examination, Otto was able to ambulate in his splints, although his weight was severely shifted onto his pelvic limbs. Without the splints, Otto was unable to ambulate and both carpi were hyperextended and painful. Stress radiographs of the carpi revealed the hyperextension injury to be at the carpometacarpal joint on the right and the middle carpal joint on the left. Because of the prolonged external coaptation, there was moderate osteopenia bilaterally. A staged bilateral pancarpal arthrodesis (PCA) was recommended. Custom carpal braces were ordered, to be worn pre-operatively on one side and eventually post-operatively on both sides.

Surgical Treatment:

The right carpus was surgically addressed first while the left carpus was fitted with a custom removable carpal brace containing a lightweight caudal splint. For the right carpus, each joint within the carpus was exposed and the articular cartilage was removed from all surfaces. A cancellous autograft was then collected from the proximal right humerus and packed within all the joint spaces of the carpus. Next, a 3.5mm/2.7mm PCA plate was contoured to provide the carpus with a 10° angle of extension. This plate was applied to the dorsal surface of the distal radius, carpus, and proximal 3rd metacarpal bone. The bones were soft from osteopenia from long-term splinting and great care was taken not to strip the screws. The repair was protected with a caudal fiberglass splint for the next two months, at which point fusion was nearly complete. The right carpus was fitted with a custom carpal brace with a lightweight splint for minor support while we proceeded with PCA on the left side. Because the left side had been in a brace with a less restrictive splint while awaiting surgery, the bones of the carpus and manus were in much better health and held the implants more securely. Post-operatively, the left carpus was protected with a caudal fiberglass splint until fusion was nearly complete at two months post-operation. The left

carpus was then downgraded to a brace with a lightweight splint while the right side (now four months post-operative) had complete radiographic fusion and was transitioned to a soft, padded brace. Another two months later, complete fusion of the left arthrodesis was achieved and all support was removed from both carpi. Otto was ambulating well on both forelimbs, with minimal shifting of his weight to the pelvic limbs and only mild circumduction of the forelimbs. There was minimal lameness, despite lack of motion in the carpi, and there was no apparent pain. Otto safely returned to his normal activities without incident.

Discussion:

The carpus is maintained in a 10-12° angle of extension by palmar ligaments and a palmar fibrocartilage. Injury to these structures results in carpal hyperextension and is most common at the carpometacarpal and the middle carpal joints. Long-term splinting does not result in sufficient healing of the injured ligaments and fibrocartilage with an acceptable return to function, so treatment requires arthrodesis. There are two types of arthrodesis to address carpal hyperextension injuries. A partial carpal arthrodesis can be used to treat hyperextension of the middle carpal and carpometacarpal joints. Since the antebrachicarpal joint, the biggest contributor to carpal range of motion, is preserved in this technique, a nearly normal gait can be maintained. However, a partial carpal arthrodesis is more difficult to accomplish, and therefore this treatment is usually reserved for performance or working dogs. The vast majority of patients are better served by PCA due to a more predictable outcome with fewer complications. With PCA, all three levels of the carpus are fused, thus eliminating any degree of motion in the carpus. These patients adapt with mild circumduction of their forelimb and have a pain-free and functional gait.

Otto's case demonstrates the typical presentation and treatment of a dog with a carpal hyperextension injury, only he was bilaterally affected with a longer recovery period. In Otto's case, custom carpal braces were used pre-operatively on one limb, and eventually post-operatively on both limbs, to decrease bandage sores and osteopenia, and to encourage faster healing. Otto experienced a successful and complete recovery of both forelimbs, as many patients can when meticulous attention is paid to intra-operative and post-operative details.





1641 Main Street • Pattersonville, NY 12137



Caring for surgical patients from three locations:

- *Pattersonville* – Main Location
- *Gansevoort* – 35 Fawn Road (at Northway Animal ER Clinic)
- *Latham* – 223 Maxwell Road

For all appointments please call: 518.887.2260



VMD: University of Pennsylvania
Internship: The Animal Medical Center
Residency: Cornell University
 Adjunct Associate Professor of Surgery, Albany Medical College
 National Institute of Health (NIH) Grant Co-Investigator

Joseph C. Glennon, VMD, Diplomate ACVS – Founder of VSRC

YOUR SURGICAL PARTNERS

Minimally Invasive • Neurologic • Oncologic • Orthopedic • Reconstructive • Soft Tissue



DVM: University of Florida
Internship: Colorado State University
Residency: Cornell University



Courtney Fitzpatrick, DVM, Diplomate ACVS

PLEASE LET US KNOW IF YOU WOULD LIKE TO BE LISTED AS A REFERRING PARTNER ON OUR WEBSITE.

September 2014

IN THIS ISSUE

- When The Spring In His Step Has Sprung!
- Your Surgical Partners