Xcyte
Nanosynthetic bone graft

Nanosynthetic Bone Graft Putty for predictable bone regeneration

Moldable, cohesive and versatile, Xcyte putty is a unique nanosynthetic bone graft that safely and predictably regenerates bone for orthopedic and spinal indications in companion animals.

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The result of years of academic research and clinical development by leading biomaterial experts and veterinary surgeons, Xcyte is now entering the final stages of clinical evaluation at Vetsuisse Faculty University of Berne.
In parallel, we are establishing a select group of European and US reference centers to join us in documenting clinical experiences with this breakthrough new therapy. Together, we can develop the ideal bone graft to ensure that pets, owners and surgeons can rest assured of predictable treatment outcomes according to the highest clinical standards.

The unmet need — bringing down the barriers to predictable bone fusion

All too often, today's bone grafts and bone graft substitutes can lead to unsatisfactory outcomes. Whether using the patient's own bone (autograft) or a processed graft from another individual (allograft), outcomes frequently include unpredictable healing or failures. Autograft transplants, for instance, both increase surgery time and costs and have the potential for significant morbidity. Allografts, meanwhile, are processed from cadaveric tissue, which is less effective than autograft and carries a risk of infection.

For pets, owners and surgeons, the need is clear for a synthetic alternative: One that is documented to safely and reliably ensure predictable bone healing and fusion.

Xcyte – mobilizing the body's natural healing properties

Xcyte is a ready-to-use nanosynthetic bone graft substitute that provides a safe and effective alternative to autograft harvest. Whether the patient's pain is due to degeneration, trauma or instability, it is designed to reliably regenerate bone while reducing surgical time and anaesthetic risk.

Harnessing the innate power of osteoimmunology

Xcyte's patented 3-phase calcium phosphate chemistry and instructive nanocrystalline structure are designed to promote rapid and reliable bone formation by harnessing the body's natural healing properties. Its unique nanostructure and chemistry stimulate positive inflammatory response, characterized by the involvement of pro-healing M2 macrophages. Once activated, these M2 macrophages initiate a natural bone healing cascade in which cell-mediated scaffold resorption leads to rapid, effective repair of bone tissue.

Novel regenerative bio-apatite chemistry

Like native bone, Xcyte consists largely of calcium-deficient hydroxyapatite, which plays an important role in catalyzing bone formation. In addition, its nanocrystalline structure closely mimics native bone structure and is therefore easily recognized by bone cells. This unique formula — hydroxyapatite (80-95 wt%), α-tricalcium phosphate (<10 wt%), and calcium pyrophosphate (0.1-10 wt%) — provides an optimal physical and chemical environment for bone biology.

Ready-to-use putty for controlled handling

Available as a moldable, cohesive and versatile bone graft putty, Xcyte is designed to enable easily controlled handling, application and placement, thereby simplifying clinical workflows and ensuring minimal surgical time and costs.

Clinical cases with Xcyte Nanosynthetic Bone Graft (NBG)

Performed at Vetsuisse Berne by Prof. Franck Forterre

Vertebral fracture in a dog

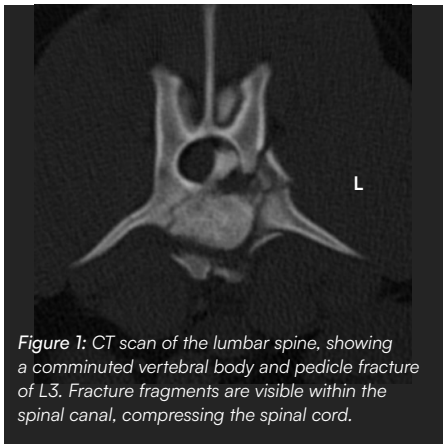

Figure 1: CT scan of the lumbar spine, showing a comminuted vertebral body and pedicle fracture of L3. Fracture fragments are visible within the spinal canal, compressing the spinal cord.

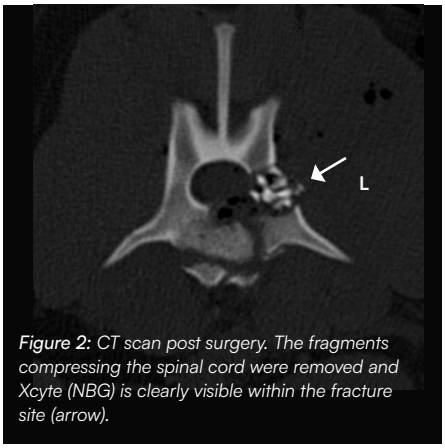

Figure 2: CT scan post surgery. The fragments compressing the spinal cord were removed and Xcyte (NBG) is clearly visible within the fracture site (arrow).

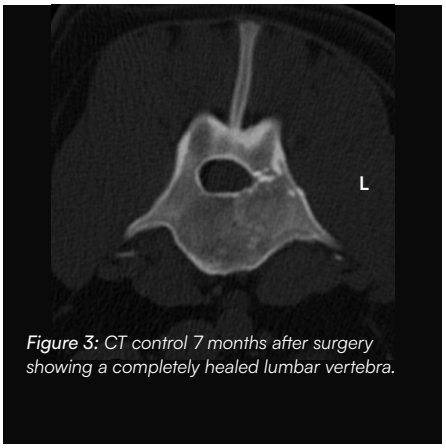

Figure 3: CT control 7 months after surgery showing a completely healed lumbar vertebra.

A one-year-old neutered male Cane Corso was brought to the small animal hospital after being hit by a car. He was lethargic and unable to walk. He presented with monoplegia with deep pain in the right hind limb and monopareses in the left hind limb. The tail was uniformly paralyzed. The neurological localization for the suspected vertebral damage was identified as the mid to caudal lumbar region. After initial stabilization, a CT scan was performed and revealed a highly comminuted compression fracture of the L3 vertebral body and pedicle on the left side. Multiple fracture fragments were visible within the spinal canal compressing the spinal cord (Figure 1).

Surgery was performed to remove the fracture fragments within the spinal canal. In addition, a new osteoinductive material, Xcyte (NBG) was placed at the fracture site to promote bone healing. First a small fat graft was inserted to protect the spinal cord from the new bone formation. Xcyte (NBG) was then gently placed to fill the bone defect within the vertebral pedicle (Figure 2).
After surgery, the dog recovered well, was able to urinate on his own, and was discharged 5 days after initial presentation with improved tail motor. The left hind limb was still paralyzed with nociception that improved over the following weeks.

At a follow-up visit 7 months after surgery, the dog was able to walk normally and, according to the owner, was living a normal life with no neurological limitations. A control CT scan showed complete healing of the fracture site at this time (Figure 3).

Treatment of carpal instability in a dog with pancarpal arthrodesis

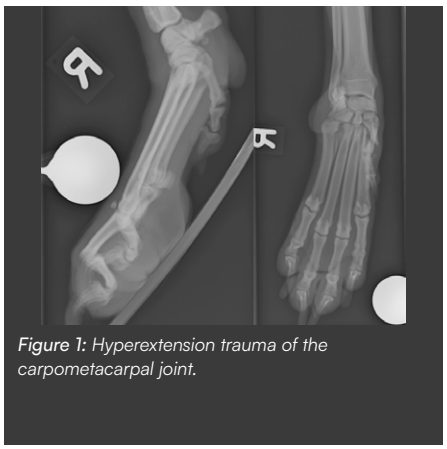

Figure 1: Hyperextension trauma of the carpometacarpal joint.

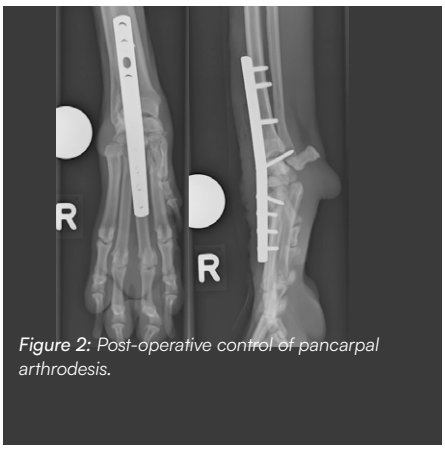

Figure 2: Post-operative control of pancarpal arthrodesis.

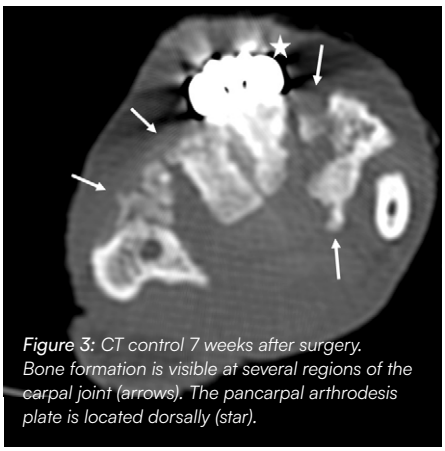

Figure 3: CT control 7 weeks after surgery. Bone formation is visible at several regions of the carpal joint (arrows). The pancarpal arthrodesis plate is located dorsally (star).

A 8 year old male castrated mix breed dog was referred to the small animal hospital after diagnosis of a carpal instability due to a jump from a 3.5 m height. Initial clinical presentation was stable and orthopedic examination revealed a severe lameness on the right front limb with carpal instability. Stress radiographs confirmed the diagnosis and the suspicion for ligament rupture (Figure 1).
Additionally to the hyperextension trauma with palmar instability of the carpometacarpal joint, an acute proximal diaphyseal fracture of the metacarpal bone II, carpometacarpal subluxation MC V was visible. As the dog had severe otitis and dermatitis, those conditions were treated prior to surgical fixation of the carpus with pancarpal arthrodesis, to reduce to risk for an infection. After both dermatological conditions were resolved the dog was operated and pancarpal arthrodesis was performed using a 3.5 mm pancarpal arthrodesis plate. Xcyte (NBG), a new osteoinductive material was additionally introduced into the joint spaces after the cartilage of the carpal articulations was removed with a small burr. Figure 2 shows the post-operative control of the pancarpal arthrodesis on the right front limb.

Bandage changes were performed at the private veterinarian. A small wound was treated with wound management (frequent bandage changes and application of wound coverage). Seven weeks after surgery a control, including a control CT was performed. The dog showed no lameness. Control CT displayed progressive, but still incomplete carpal ankyloses and persistent dislocated fractures of Mc II and V, with little bridging callus.

Current status of Xcyte Nanosynthetic Bone Graft Putty

Pre-clinical proof of concept

Porcine, spinal clinical model at Swedish University of Agricultural Sciences
— CT follow-up at 3 month intervals
— PET/CT and histology at termination

Clinical evaluation with companion animals at Vetsuisse Faculty University of Berne
— Inclusion ongoing
— CT follow-up at 3 month intervals

Clinical reference centers
— Inclusion ongoing to establish a number of reference centers in Europe and the US to document broader user experiences and outcomes.

About Cavix

Because every pet deserves the best available care
Cavix is dedicated to accelerating the evolution of veterinary care by transforming the latest biomedical innovations into well-documented veterinary therapies. Based at Green Innovation Park, an innovation hub at the Swedish University for Agricultural and Veterinary Science in Uppsala, our founding team is grounded in advanced research into regenerative technologies for bone defects. Together with world-renowned veterinary surgeons, senior management and founding investors with a proven track record of global commercial development, we're bringing together the necessary scientific, commercial and clinical expertise to give every pet the care they deserve.

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