

Stem cell therapy for working dogs



Veterinary surgeon **ANDREW ARMITAGE**, BSC BVM&S MRCVS, explains how stem cell therapy could help your gundog recover from arthritis or working injuries.

There has been a lot of media attention recently regarding stem cell therapy (SCT) and regenerative medicine in humans - but what about in animals? You may be surprised to hear that SCT has been provided by vets for more than a decade. Initially SCT was used to treat tendon injuries in horses but with recent advances and availability of regenerative technologies we have started to treat dogs as well.

Regenerative medicine is defined as "the process of replacing, engineering or regenerating cells, tissues or organs to restore or establish normal function". In the veterinary field we are using the body's own repair kit to enable us to do this.



an xray of severe osteoarthritis in a Labradors elbow secondary to elbow dysplasia that was successfully treated with stem cell therapy

Within every tissue of the body there are cells called adult stem cells. These cells are activated when a tissue or organ is damaged through disease or trauma and they are able to initiate and control the repair process. They do this by interacting with other cells after responding to chemical messages from them and also by turning into other cell types to replace damaged cells and tissue. Sometimes this normal regenerative response by the body is overwhelmed and the repair is not complete, or other disease processes occur that prevent it from happening. These regenerative cells are found in highest concentrations within the body's fat or adipose tissue. Large numbers are also found in bone marrow. Bone marrow transfusions are a form of stem cell therapy; healthy bone marrow transplanted into a patient with defective marrow can restore normal function.

We see a large number of working and agility dogs with sports-related injuries and osteoarthritis from elbow/hip dysplasia, trauma and very active lifestyles. Traditionally, these problems

Frankie a six year old Labrador that had stem cell therapy two years ago for elbow osteoarthritis secondary to elbow dysplasia. As you can see from the recent photos he is doing very well!



Andy Armitage performing stem cell implantation in a dog

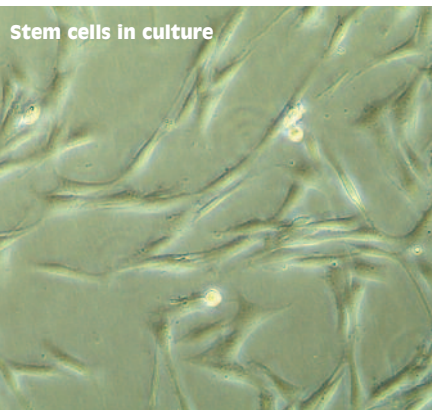
already degenerating. Radical surgeries are sometimes required to salvage these joints but unless complete joint replacement is undertaken OA leads to chronic pain and debility.

For the last two years, we have been providing regenerative technologies for our canine patients with joint, tendon or ligament diseases with amazing results. We are able to take stem cells from fat or bone marrow under a short general anaesthetic and then culture or concentrate them and place them directly where they are needed. The stem cells have a very quick and profound effect on reducing joint inflammation, and therefore pain and swelling. They are able to remodel the arthritic bone and joint capsule to increase the range of motion that was previously restricted by new bone production and fibrosis. In many cases, we see new cartilage formation and those joints that were crunchy on articulation become smoother due to a new lining of cartilage. These effects appear to be long-lasting, with many dogs receiving only one injection while other need top-ups twelve to 18 months later. The majority of treated dogs are able to come off most or all of their pain-killing medication.

provide a microscopic framework to help stem cells form new cartilage. In all treated cases, I recommend laser therapy. The laser is applied to the joint after stem cell implantation and this helps activate the stem cells and surrounding tissues to start the regenerative response in a process called photobiomodulation. Laser therapy can be used on its own or in combination with other regenerative techniques. Laser therapy is very effective in reducing pain and swelling, stimulating the natural repair pathways and reducing scar tissue formation.

Fat Harvest

SCT can normally be performed in just two visits, the first being fat harvest under general anaesthetic and the second (usually two weeks later) being implantation of the stem cells under sedation. Fat is normally harvested via a small incision in the groin and the stem cells are implanted into the joint via an injection after the area has been shaved and aseptically prepared. The effects are usually seen within the first two weeks of SCT but the maximal effects are not seen until three months following implantation. Treatment costs can vary considerably depending on the severity of the condition and how many joints are needing to be treated. Costs are usually in the range of £1,200 to £3,500. The latter would be to treat multiple joints and spinal arthritis with SCT, PRP, biological scaffolds and post implantation laser therapy.



would be treated with rest and painkillers and possibly physiotherapy. Unfortunately, drugs cannot repair an injury, they can only reduce pain while the body heals. Sometimes the body can't heal effectively and this leads to chronic pain and loss of function. Osteoarthritis (OA) is a degenerative condition and once this has started it inevitably worsens with age. Sometimes we see OA in very young animals with hip or elbow dysplasia and treatment of the underlying problem has been too late. By this stage the joints are



Frankie enjoying life after his stem cell treatment

Cartilage damage

For severe cases, we have other technologies available in addition to SCT. Platelet rich plasma (PRP) can be used to give the stem cells a boost and provide a lot of growth factors to stimulate regeneration. PRP is obtained from a blood sample from your dog, which is then processed in-house and introduced immediately into the joint or tendon. Where there are large areas of cartilage damage and loss we may add in biological 'scaffolds' along with stem cells and PRP. These are biologically inert materials that

If you feel that regenerative treatments could help your dog, contact Andrew as below:
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NOTE These treatments may not be covered by all dog insurance companies – please check with your provider.