cell therapy sciences
Developing Regenerative Medicine for Vets

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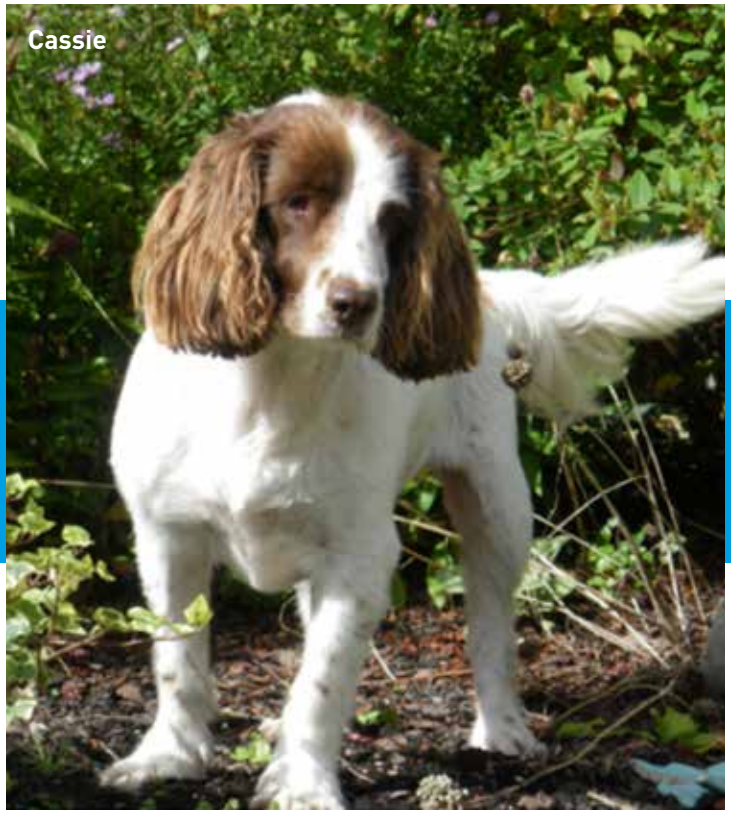
Adipose - derived cultured stem cell therapy

For when they can no longer get up to their old tricks...

When Cassie's owners saw that her pain was getting worse due to progressive severe arthritis, they feared that the impact on their beloved pet's quality of life would mean they soon needed to make the most difficult decision of all. But Cassie's life changed when her vet suggested intra-articular stem cell therapy.



Cassie was already taking 3 different pain medications for her arthritis (OA), secondary to hip and elbow dysplasia, but was still in pain. She had marked joint effusion with almost no flexion in her elbows and her hip joints could be heard crunching whenever they were extended.

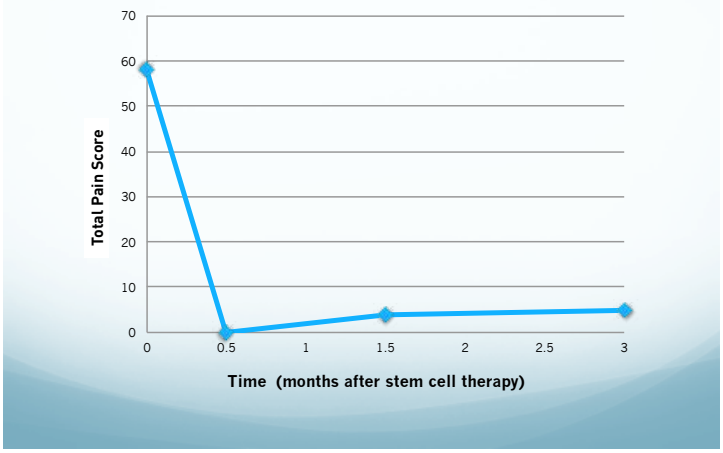
A New Lease of Life

Following surgery to remove a small sample of inguinal adipose tissue, Cassie's stem cells were isolated in a sterile laboratory at Cell Therapy Sciences, using a procedure that selects and cultures many millions of mesenchymal stem cells (AD-MSCs). Two weeks after surgery her stem cell vials were ready to undergo a full sterility check, before being shipped back to her local veterinary clinic where more than 2 million stem cells were injected into each of her affected joints.

Cassie's vet Andrew Armitage - a specialist in Regenerative Medicine based in St Boswells in the Scottish Borders - reported that Cassie responded rapidly, showing a marked reduction in pain and inflammation within two weeks of receiving her stem cell injections (Fig 1). Within 3 months her pain medication was significantly reduced, clinical examinations recorded smooth articulation in her hip joints with 95% reduction in crepitus and both of her elbows were able to flex normally.

Cassie's owners were delighted and reported that Cassie's whole demeanour changed soon after her stem cell injections; once again she was a happy and adventurous dog, able to "run and gallop" during her long walks.

Fig 1: Pain scores assessed by the canine brief pain inventory[1]



Cassie was one of the first dogs treated with an AD-MSC therapy called **AdiShot®**, developed by the team at Cell Therapy Sciences Ltd (CTSL). CTSL are specialists in veterinary cell therapies, using advanced cell culture technologies - and conducting their own research to optimise their stem cell products. To date the team has provided cultured stem cell therapy for more than 600 companion animal and equine cases.

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PUBLISHED CLINICAL EVIDENCE

Orthopaedic veterinary specialist, Assistant Professor Karen Perry, published a review in April 2016 in which she examined the extensive literature on the use of stem cell injections for degenerative joint disease.[2] This review concluded that "current evidence supports the use of stem cells in patients that have failed to respond adequately to more conventional therapies" and "may offer an option whereby (salvage) surgical management can either be delayed or avoided without condemning the patient to a life of ongoing discomfort". Furthermore, a recent randomised, placebo-controlled study published September 2016 has provided robust, confirmatory evidence demonstrating significant clinical efficacy following a single injection of allogeneic cultured stem cells in canine OA[3].

LONG TERM RESULTS IN ARTHRITIS AND TENDONITIS

Cases suitable for stem cell treatment are not limited to severe, end-stage OA but encompass a range of patients, young and old, suffering from joint disease and tendinopathies that have failed to be controlled by more conventional treatments, or where there is no suitable surgical solution[2]. Cases like Maisey, with bilateral elbow dysplasia and previous injury to her hind limb flexor tendons. When Maisey was 6 months old, she had a terrible accident in which her left hind tendons were severed by a pane of glass. Even though she received surgery to repair the injury, for nearly 18 months she could not use her left hind leg due to many complications and multiple infections, resulting in overload of her forelimbs and subsequently elbow arthritis.

Eventually, following hydrotherapy, Maisey started to use her left hind limb, but this leg was never "normal; she would frequently inflame the tendon scar tissue, creating further lameness. Many different modalities have been used to treat Maisey's elbows and tendons - laser physiotherapy, chiropractic, acupuncture - but without lasting effects.

Maisey's vet Rachel Mowbray decided that AdiShot cultured stem cell therapy might help her patient to lead a more comfortable life - and 8 months ago Maisey received a special stem cell protocol for her elbows and her damaged tendons.


Maisey

Maisey's owner, who is an animal chiropractor, recently reported that " This immediately made a big difference to her. She is trotting normally, using the left hind all the time, whereas she would hold up the leg when crossing any uneven or stony surface previously. She has a much better quality of life. Maisey now jumps the garden gates and has become an escape artist! She was always easy to keep in before as she wouldn't dream of jumping anything, even off the sofa. The stem cell therapy has given her a new lease of life, she is quick and agile, doesn't get as grumpy with other dogs, able to jump on and off the sofa with ease, and isn't stiff in the mornings. In all, I am very impressed with the effects of the stem cells, and have referred many people to check it out with their dogs!"

CHANGING THE LIVES OF WORKING DOGS

Cases like Nicky, a working Labrador who had always been keen and kept just ahead of his owner whenever he was working. Nicky started to fall behind during the shoot with a noticeable limp on his left fore and inspite of conventional treatments, Nicky remained lame. His vet, Debbie McDonald in Glasgow, suggested AdiShot stem cell therapy to his owner - and within 12 weeks of his stem cell injections, Nicky was back out in front with no noticeable limp. He has remained sound for 18 months and his delighted owner thanked Debbie for "giving him his dog back" .

STEM CELLS FOR LIFE FROM A SINGLE HARVEST

Stem cells for each animal are stored at CTSL and repeat therapies can be generated. The CTSL database indicates that less than 20 % of dogs require a repeat therapy during the first 18 months following cultured stem cell injections.

Freddie received stem cell therapy for pain and limited mobility due to bilateral elbow OA. Within 4 weeks of stem cell therapy, significant improvements in Freddie's pain and mobility scores were reported and his elbow joint flexion angles were reduced into the normal range. Freddie's joints started to get sore again after 8 months and his owner wanted to repeat his therapy. Thanks to the CTSL cryo-archive, this simply requires a phone call from the vet to our laboratory and repeat injections can be available in 2 weeks. Two years since receiving his first stem cell injections, Freddie has now received his second repeat therapy and can already be seen playing "tug the toy squirrel" with the family's puppy. Freddie's stem cell journey can be followed at **www.celltherapysciences.co.uk/case-study-freddie** and his story can be found in the Kennel Gazette, October 2016[4]


Freddie

References
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