

STEM CELL THERAPY FOR ARTHRITIC DOGS

The art of stem cells

Worldwide media reports about stem cell therapies are becoming common place as stem cell applications are being pursued in diverse areas including cardiology, orthopedics, oncology and internal medicine. One area in which stem cell technologies are advanced is in the treatment of osteoarthritis in dogs.



Statistics show 1 in 5 dogs suffer from osteoarthritis, a chronic, painful and debilitating disease for which there is no known cure. Stem Art has pioneered a commercial application, which contains adult mesenchymal stem cells and associated cell populations derived from fatty tissue deposits. The procedure is being utilized to treat dogs with arthritis and is already demonstrating very promising results.

Stem Art have a regenerative procedure for arthritic dogs, which utilizes the body's own ability to heal itself. This safe technology is being used to heal painful arthritic joints such as knees, elbows, shoulders and hips, and has also been successfully used to treat dogs with hip dysplasia. It has been shown to reduce pain and dependence on medication and improve the general wellbeing of dogs that had previously struggled to walk, run, and get in and out of the car. Stem Art company utilizes the dog's own fat cells which carries no risk of rejection. Fat or adipose tissue is used for its abundant supply of adult mesenchymal stem cells. These stem cells are also easier to harvest, unlike bone marrow stem cells, which are extracted from the hipbone during complex surgery.

Recent have demonstrated that adult adipose-derived cell populations secrete proteins that are known to have potentially powerful anti-inflammatory capabilities. Also a cocktail of proteins are identified that are known from published studies to down regulate various stress markers in cells around them. The Stem Art three step procedure is made up of distinct processes:

1. Veterinarian Health & Wellbeing Assessment

- A complete veterinary history and examination by the clinic
- Neurological and orthopedic examination and scoring
- Diagnostic imaging including high definition CT Scanning to help reduce imaging time, significantly increase joint detail, and rule out pre-existing surgical lesions
- Joint fluid cytology and culture and sensitivity, or synovial biopsy where indicated
- Gait analysis

2. Adipose Tissue Extraction



Removal of adipose tissue is carried out under general anesthetic and is performed either via removal of the inguinal fat pad or via liposuction.

Once the adipose tissue-derived material is harvested (two tea spoons or 20 grams of fat), the joints requiring implantation are shaved and the dog is removed from general anesthetic and receives further levels of opiate as required.

3. Isolation of adult stem cell population

The adipose tissue is processed according to Stem Art procedures.. The cell population contains a mixture of various cell types including adult mesenchymal stem cells and their derivatives. A minimum of 30 million cells are delivered within 2 weeks and can be injected in one or more joints.

4. Transplantation of autologous cells

The patient is lightly re-anaesthetized and the joints are surgically prepared. Transplantation is performed via a standard injection for each joint. Joint fluid is aspirated to ensure correct placement before the cells are injected. It is advisable not to inject more than 4 joints at the same procedure.

Results



During clinical trials in the World, thousands of dogs that received stem cell treatment for arthritic joints were assessed prior to, and after treatment. The assessment involved a veterinary assessment prior to treatment, an assessment at 30 days intervals for 3 months. The examination involved scoring for lameness, range of motion, functional disability, pain on manipulation, proprioception, swelling and ability to climb stairs and to jump.

Within 10 days of being treated with stem cells, some arthritic dogs showed a significant and in certain cases, a dramatic improvement in mobility. At the six-month point, results showed all dogs that suffered from osteoarthritis and joint pain, improved after the Stem Art treatment. All dogs showed improvement in mobility in their arthritic joints. The improvements ranged from 50 % better mobility, which represents the worst result, to 100% improvement. Average mobility improvement is 85%. An independent survey with dog owners confirmed these results. Dog owners total satisfaction rate was almost 100%, three months after treatment. Results show 100% of dog owners consider the severity of their dogs arthritis had decreased after Stem Art treatment.

There are a number of possibilities as to why Stem Art produces such dramatic improvements, including the molecules produced by the transplanted stem cells leading to anti-inflammatory effects, and the local environment being stimulated to generate new cartilage via the transplanted cell population and/or the resident cells of the synovial sac (thin tissue that lines the joint).

When adult mesenchymal stem cells are transplanted into damaged joints, the cells are observed to embed into the surrounding tissue and to generate new cartilage (Murphy, Fink et al. 2003; Wakitani, Goto et al. 1994). Beyond the risks of anesthesia, fat harvest site bruising and irritation, as well as the minimal risk of infection in the harvest or implantation site, the Stem Art procedure is well tolerated by dogs.

Most dog owners are generally surprised at the degree of recovery the day after the procedure. If a surgical fat pad excision is required, the harvest wound is usually bruised and in some cases swollen. However, this rarely creates problems for the dog. Of the cases treated to date, only a few dogs have shown no signs of improvement and no dogs have had their condition worsened by the procedure.