



Allogenic delivery of adipose tissue-derived mesenchymal stem cells for pain control in dogs with bilateral hip dysplasia: a case study

Celina E. O. Okubo^[a], Marianne C. Dias^[a], Luciana R. Mesquita^[a], Hugo S. Oliveira^[a], Leandro Maia^[a], Sheila C. Rahal^[a], Fernanda da C. Landim^[a], Stelio P. L. Luna^[a]

^[a] Faculdade de Medicina Veterinária e Zootecnia (FMVZ), Universidade Estadual Paulista (UNESP), Botucatu, SP - Brasil

Abstract

Studies have reported similar results of the use of mesenchymal stem cells from allogeneous adipose tissue (MSCs-AT) compared to an autologous treatment for the treatment of joint diseases in dogs, with no risks of immunogenicity. As there are many dogs with osteoarthritis (OA) and there is evidence suggesting that in many cases non-steroidal anti-inflammatory drugs cannot eliminate pain completely, the treatment with MSCs-ATs may be a therapeutic alternative. Bilateral hip dysplasia (BHD) is a disease of great incidence in dogs and its development is related to OA, which is the reason why it was chosen as a parameter in this study, in order to assess the efficacy of intra-articular injection of MSCs-ATs in the control of pain in dogs with BHD. An eleven-year-old Labrador Retriever dog weighing 39 kg with primary complaint of pelvic limb claudication was referred to our practice. The owner reported that the dog was feeling pain, which was evidenced by the struggle of the animal to climb stairs, jump, run and rise from rest. After performing physical and complementary tests (clinical examination, joint ultrasound and X-rays, blood count and biochemical tests), BHD was diagnosed based on joint ultrasound and X-rays (irregular femoral head, bone proliferation, and shallow acetabulum on both sides). Twenty million allogeneic MSCs-ATs were used for the implantation (cell bank properly characterized from a single donor). Two applications were performed in the impaired joints with a 30-day interval (days 0, 30). The dog in the study was filmed during walking, running, jumping and climbing stairs on days 0, 30 and 60 for subsequent assessment. Clinical pain assessment were performed pre-treatment on day 0 and post-treatment on days 7, 30 and 60, according to Helsinki Chronic Pain Index (HCPI) questionnaire and the 0-10 Visual Analogue Scale of pain (VAS) (0 = no pain, 10 = maximum pain level), as well as a baropodometric examination using a pressure platform (days 0, 30, 60). Gradual improvement in locomotion was reported within 7 days from the first application (VAS Day 0 = 6.8, VAS Day 7 = 4.1, VAS Day 30 = 4.1, VAS Day 60 = 3.1), and it was easier for the dog to jump and climb stairs. Two veterinary doctors (1 and 2) examined the dog by recording non-dated videos and using the HCPI questionnaire. According to that there was an improvement in pain response to palpation, claudication and ability to climb stairs. The VAS score was also established by the assessment of veterinary doctors (VAS-1 Day 0 = 7.1 / VAS-2 Day 0 = 4.1; VAS-1 Day 30 = 4.6 / VAS-2 Day 30 = 5.2; VAS-1 Day 60 = 1.5 / VAS-2 Day 60 = 3.1). There were no significant changes in baropodometric examination to the moment, since the weight compensation mechanism between hind

limbs and forelimbs was very similar on days 0, 30 and 60. The MSC-AT therapy has apparently been beneficial to reduce pain and to improve the quality of life in a dog with BHD.

Ethics Committee: CEUA FMVZ, UNESP – Campus Botucatu 35/2013.