Davood Sharifi et al., J Vet Sci Technol 2018, Volume 9
DOI: 10.4172/2157-7579-C2-039

Clinical and radiographic evaluation of osteodisc allograft impregnated with mesenchymal stem cells for replacement of normal cervical disc in dog

Davood Sharifi, Shaghayegh Rafatpanah, Mohammadreza Golbakhsh, Sarang Soroori, Fatemeh Aramesh, Alireza Bashiri, Davood Faskhoudi, Rouhoulah Esanejad
University of Tehran, Iran

Statement of the problem: Dogs with cervical vertebrae disc degeneration, budging and even calcification and even with wobbler syndrome show various clinical signs depends upon several factors, especially, the pressure on the spinal cord and/or nerve roots, which are quite painful. Conservative management usually accompanied by mildly wobbly gait, but with repeated episodes of neck pain, surgery with replacement of disc recommended.

Methodology & Materials: The complete cervical vertebrae from two medium size mongrel dogs cadaver were collected. The total of 3 discs along with end-plate and bodies were removed from each cadaver and transplanted to 3 other adult–large male mixed breed (25±30 Kg.bw) after complete removal of 3rd normal vertebral disc in each dog and stabilized with double 2.7 mm cancellous screw. Allograft osteodisc was impregnated with 1 ml broth of autologous mesenchymal stem cells before replacement (10^{-10}) in first 3 dogs whereas the rest of 3 dogs used as control one. Five main radiographic parameters including osteodisc density, osteophytes and calcification of grafted tissue, dislocation and distance of grafted disc beside complication, infection and fracture were recorded before and after operation and at 6 months.

Findings: Radiographic data showed that grafted osteodisc plays a role in reconstruction or maintenance of intervertebral functional spinal unit, treated segment, and adjacent segments and did not show a significant difference before and after replacement. Clinical outcomes indicated that using osteodisc allograft for cervical disk replacement is reliable. Heterogenous density with no dislocation and discopathy in one case with variable changes in disc distance were prominent radiographic findings.

Conclusion & Significance: A disc replacement is thought to reduce mechanical stress when compared to a fusion. Using osteodisc allograft besides maintaining the "movable" normal cervical joints, preserving motion in the spine which is an ideal outcome.

Recent Publications

1. Caridi, John M., M.D., Pumberger, Matthias, M.D., Hughes, Alexander, P., M.D. Cervical Radiculopathy: A Review. Hospital for Special Surgery. Sept. 2011. Accessed Jan 2016.
2. Denis, Daniel; Shedid, Daniel (2014). "Cervical spondylosis: a rare and curable cause of vertebrobasilar insufficiency". Eur Spine J. 23
3. Jeffery N, McKee W (2001). "Surgery for disc-associated wobbler syndrome in the dog--an examination of the controversy". J Small Anim Pract.42 (12): 574–81. doi:10.1111/j.1748-5827.2001.tb06032.x. PMID 11791771
4. Hao-Xuan Zhang,; Yu Chen,; Peng Gao,; Yuan-Dong Shao,; Yong Hou, ; Lei Cheng, ; Sailendra Maharjan,; Lin

Nie,(2014) Clinical and Radiographic Evaluation of Cervical Disk Replacement: A Retrospective Study. Orthopedics. 2014;37(11):e956-e961.https://doi.org/10.3928/01477447-20141023-50

5. Sugawara, Taku (2015). "Anterior Cervical Spine Surgery for Degenerative Disease: A Review". Neurologia medico-chirurgica. 55 (7): 540–546. doi:10.2176/nmc.ra.2014-0403.

Biography

Davood Sharifi has completed his veterinary graduation (B.V.Sc & A.H, M.V.Sc & Ph.D.) from PAU & HAU in year 1990 India, he joined as an assistant professor to the University of Tehran in year 1991 and was self-promotion to full professor in year 2007. His master –plan was focused in orthopedic and spine surgery, lameness, physiotherapy and experimental surgery. He was selected as a distinguished and eminent researcher in year 2007 and 2009 in the University of Tehran. He has published three surgery books, and having 115 publications in his CV, participated in 62 national and international congresses with109 research papers. He directly supervised 98 undergraduates and 30 post–graduate students. He has 41 applied research projects. He is expert in PRT and PDC intervertebral disc treatment via CTScan. Presently he is acting as Director of Research at the Faculty of Veterinary Medicine, University of Tehran, Tehran, Iran.

dsharifi@ut.ac.ir