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Adipose derived mesenchymal stem cells in the treatment of degenerative disc disease: Protocol and personal experience

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Lumbar degenerative disc disease (DDD) poses an ongoing challenge as far as treatment options and alternatives, especially when considering younger patients. Over 80% of the adult population presents with one or more episodes of ongoing-progressive Low-Back Pain (LBP). The primary cause is associated with degeneration of the intervertebral disc and which is triggered by a decrease of the nucleus pulposus cell population, as evidenced in histological studies. Definitely, in the presence of a black disc without profusion and neurological compromise, microsurgery or even fusion surgery should not be contemplated. Numerous percutaneous techniques have been propagated as proper way to treat this condition throughout the literature in the past years. They have been primarily focused on the treatment of the pain generated by the involved disc and the subsequent segmental insufficiency, without addressing the degeneration of the disc and for this have had limited success and remain as pain management tools. Some significant trials in the past (i.e. chondrocyte transplantation trial) and the increasing recent research and achievements with more biological strategies as far as tissue regeneration, have motivated the development of a new treatment concept initially applicable to the lumbar spine which will be presented and discussed. Advancements have led to a significant improvement in the understanding of the cell environment and tissue transplantation at a molecular, cellular and immunobiological level. Adipose tissue has already become a central source of clinical and research work involving adipose tissue derived progenitor cells. Endothelial and mesenchymal stem cells derived from adipose tissue are being considered and used in an array of clinical conditions and seem to have clear therapeutic benefits for many disease conditions including those affecting bone, cartilage and muscle. The use of an accessible source with abundant cells which have a high potential for regeneration clearly is superior in comparison to the chondrocyte option for the lumbar disc. Mesenchymal cells have a high self-renewal capacity and a potential for multi lineage differentiation. For this, adipose tissue derived MSCs (ADMSCs) are optimal candidates for tissue regeneration and can be obtained from the patient in a one-step procedure-treatment.

Biography

Long time direct co-worker of Prof. Dr. Madjid Samii in Hannover, Germany. Besides general micro neurosurgery, special interest and expertise in the management of head trauma, neurooncologist, stereotaxic and radiosurgery, spinal surgery including less invasive techniques and neuroradiology. Presently since 2014, Middle East Chairman of ISLASS. Active Member and Board Member of numerous international societies, among these : SAS, German Neurosurgical Society, AANS and the Skull Base Study Group. Fluent in English, German, Spanish, Italian and with knowledge of French. Since 2017 , additionally , Lead Neurosurgeon at the Waldkrankenhaus for Special Surgeries by Leipzig , Germany-Trauma, Sport and Spine Department. Executive Board Member and Dean of the Faculty of the WAMS.

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