Young Human Lumbar Disc: Viability and Matrix Profile

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Introduction: The endplates are layers of hyaline cartilage bordering the disk above and below with the vertebral bodies. Estimates that blame degenerative disc disease by up to 40% of chronic back pain and various options of recent treatments has been offered, such as gene therapy, protein or cell therapy. A limiting factor is the understanding of the biology of cells and their viability inside the disc because the implanted cells cannot survive in this environment such as the local cells. Thus the aim of this work is to demonstrate the distribution of live and dead cells inside the disc and analyse the glycosaminoglycans (GAGs) and hyaluronic acid (AH) distribution.

Material and Methods: Five lumbar spines aged less than 50 years old were harvested within 24h post-mortem and kept freeze until analysis. The normal discs L4-5 were submitted to viability cellular by MTT assay, identify of glycosaminoglycans by electrophoresis method, hyaluronic acid was measured by ELISA-like method. Fragment of 5 mm thick was stained for Picro Sirius red. Results: Low number of viability cell was observed in the central area of the disc. Central area presented higher concentration of thin collagen. AH distribution follows the sulphated GAGs with less concentration in the annulus. Thinner collagen fibers were found more consistently in the central area and thicker fibers in the annulus. Conclusion: In the center, there are fewer cells but conversely a greater number of vessels coming to ensure the nutrition of these cells. The centre of the disc presents greater amount of thin fibers of collagen suggesting higher turnover in this region.

Keywords: Human Lumbar Disc, viability cellular, glycosaminoglycans, hyaluronic acid, collagen fibers