Chondrocyte suspension in fibrin glue – preliminary study.

A. Wysocka¹, H. Bursig¹, S. Dyląg¹, J. Dec², T. Gaździk²

¹ Regional Blood Center – Tissue Bank, Raciborska 15 street, Katowice, Poland
² Department of Orthopedics and Traumatology Medical University of Silesia, Sosnowiec, Poland

Full-thickness cartilage defects are common problems in knee surgery. Articular cartilage is incapable of undergoing self-repair. Traumatic lesions stay empty or are filled with fibrocartilaginous tissue.

Autologous Chondrocyte Implantation has been shown to be a promising method for treating deep defects in the articular cartilage. The hyaline cartilage formed by implanted autologous chondrocyte has biomechanical properties similar to those of natural articular cartilage. ACI technique was the first used to treat patients by Britberg, Lindhal and Peterson in 1987.

Three dimensional scaffolds are becoming increasingly popular in treatment of cartilage defects as a chondrocyte carrier and cause periosteal flap unnecessary. Fibrin glue can be used potentially as a three dimensional cell delivery vehicle.

Our Tissue Bank prepare for chondrocyte transplantation in patients with chondral defects. Current study describes our experience with human chondrocyte culture and preparation of chondrocyte suspension in fibrin glue. Biopsies were obtaining from 15 patients, aged 28-74, and undergoing arthroscopy for different reason. In this study we evaluate transport of cartilage to tissue bank, enzymatic isolation, in vitro chondrocyte cultivation, and finally chondrocyte suspension in fibrin glue and procedure to adapt size and thickness of chondrocyte fibrograft for clinical application. The allogenic fibrinogen/fibrin glue was prepared from donors in Regional Blood Center of Katowice. We also reveal: high viability of chondrocyte in fibrin glue, relationship between patients age and chondrocyte viability and possibility of proliferation, faster chondrocyte proliferation in human serum than bovine, possibility of chondrocyte cryopreservation.