

A NOVEL APPROACH TO NEOCHONDROGENESIS INDUCED BY PERIPHERAL BLOOD STEM CELLS AND HYALURONIC ACID

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Purpose: To assess the results of chondrogenesis in the knee joint following subchondral drillings into chondral defects followed by post-operative intra-articular injections of autologous peripheral blood stem cells (PBSCs) in combination with hyaluronic acid (HA).

Methods: 10 patients with full thickness chondral defects treated with arthroscopic multiple subchondral drillings from an on-going clinical trial with a minimum follow up of one year were included. Post-operatively, the operated knee was placed on continuous passive motion two hourly per day for a period of 4 weeks and was on partial weight bearing for the first six weeks. Autologous PBSCs were harvested by the process of apheresis after surgery. The harvested PBSCs were then divided into vials and cryo-preserved for later use. One week after surgery, a five weekly intra-articular injections of PBSCs (2.5mls) mixed with HA (2mls) were commenced.

Results: Sequential MRI scans showed healing of the subchondral bone with evidence of chondrogenesis. Second look arthroscopy with biopsy on two patients confirmed chondrogenesis and satisfactory incorporation of the newly regenerated cartilage with the surrounding articular cartilage. Chondral biopsy showed full thickness mature chondrocytes with the presence of hyaline cartilage. All patients showed improved IKDC scores post-operatively. Apart from the discomfort of PBSCs harvesting and localized pain associated with the intra-articular injections, there were no other notable adverse reactions.

This is a simple and effective method of regenerating articular cartilage involving only a single arthroscopic procedure followed by post-operative out-patient intra-articular injections of autologous PBSCs combined with HA.

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