Autologous collagen-induced chondrogenesis: single-stage arthroscopic cartilage repair technique.

Authors: Shetty AA, Kim SJ, Bilagi P, Stelzeneder D

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Abstract:

Autologous collagen-induced chondrogenesis is a novel, single-staged arthroscopic cartilage repair technique using microdrilling and atelocollagen or fibrin gel application under carbon dioxide insufflation. Atelocollagen is a highly purified type I collagen obtained following the treatment of skin dermis with pepsin and telopeptide removal, making it nonimmunogenic. In this procedure, atelocollagen mixed with fibrinogen and thrombin in a 2-way syringe can maintain the shape of the articular surface approximately 5 minutes after application due to the reaction between the thrombin and fibrinogen. Carbon dioxide insufflation facilitates the application of the gel under dry conditions. Ten patients (mean age, 38 years) with symptomatic chondral defects in the knee who were treated arthroscopically with microdrilling and atelocollagen application were retrospectively analyzed. All defects were International Cartilage Repair Society grade III or IV and were 2 to 8 cm(2) in size intraoperatively. For the clinical assessment, Lysholm score was assessed preoperatively and at 2-year follow-up. All patients underwent morphological magnetic resonance imaging at 1.5-Tesla at 1-year follow-up. Mean Magnetic Resonance Imaging Observation of Cartilage Repair Tissue score at 1-year follow-up was 70.4 +/- 20.2 (range, 15-95). The Magnetic Resonance Imaging Observation of Cartilage Repair Tissue score for patellar lesions was similar to that of lesions in other locations: 73.3 +/- 11.7 vs 68.1 +/- 25.5, respectively. This technique had encouraging clinical results at 2-year follow-up. Morphological magnetic resonance imaging shows good cartilage defect filling, and the biochemical magnetic resonance imaging suggests hyaline-like repair tissue.