Fibrin glue and demineralized bone matrix effect on autologus cartilage graft in microtia reconstruction

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Abstrak

Background: Microtia reconstruction is a challenge for ENT Head and Neck surgeons. Varioussurgical techniques using autograft cartilage have been done to perform auricular reconstruction.Knowledge of cartilage graft concerning resorption process that affected the size, form, and aestheticsubunit of the ear is mandatory. Purpose: To evaluate the success of cartilage autograft by identifyingchondrocyte apoptosis, tissue degradation based on cell character, matrix homogeneity, fibrosis,proteoglycans, collagen and Transforming Growth Factor β (TGF β) expression in application of FibrinGlue (FG) and or Demineralized Bone Matrix (DBM) after 12 weeks in microtia reconstruction by Nagatatechnique. Methods: Quasi-experiments. FG and/or DBM were applied on the rest of the 12 ear cartilageframework which was implanted on mastoid area. Apoptosis was examined by TUNEL. Safranin Ostaining and modified Mankin's score was used to evaluate cartilage degradation and TGF β expressionby ELISA. Results: FG or DBM on cartilage graft showed significant increase in chondrocyte viabilitycompare with control group (p=0.00). Minimal fibrosis, more homogeneous extracellular matrix, decreasedproteoglycan and minimal thickening of collagen, had significant differences compared with control orFG-DBM group. Structure differences occurred among cartilage graft after 12 week implantation whereasFG showed minimal fibrous tissue, normal cell character, proteoglycan, collagen, and tissue homogeneity(p< 0.05). Conclusion: FG is highly recommended to reduce degradation of cartilage graft in microtiareconstruction. DBM can be still used to maintain chondrocyte viability, proteoglycans, and collagen.
Keywords: cartilage graft, fibrin glue, demineralized bone matrix, transforming growth factor β, Mankinscore.