

Experimental use of fibrin glue to induce site-directed osteogenesis from cultured periosteal cells.

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Abstract:

The purpose of this study was to determine whether a combination of fibrin glue and cultured periosteal cells will result in new bone formation at heterotopic sites in nude mice. Growing cells and developing matrices surrounding periosteal explants from the diaphyses of radii of newborn calves were minced and mixed with fibrin glue in a syringe. The cell/matrix-fibrin glue admixture was then injected into the subcutaneous space on the dorsum of athymic nude mice. After 12 weeks of implantation, gross morphology and histologic investigations showed newly formed bone structures in all cell/matrix-fibrin glue admixtures, but none in fibrin glue injected alone and used as control samples. Osteopontin, a protein important in bone development, was identified by a Western blot assay of the cell/matrix-fibrin glue composite. This study supports the feasibility of initiating site-directed formation of bone structures at heterotopic tissue sites by means of injection of cultured periosteal cells and matrix in a fibrin glue carrier.