عنوان مقاله:

Homing of adipose stem cells on the human amniotic membrane as a scaffold: A histological study

محل انتشار:

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خلاصه مقاله:

Background: The human amniotic membrane (HAM) is a suitable and effective scaffoldfor cell culture and delivery, and adipose-derived stem cells (ADSCs) are an importantsource of stem cells for transplantation and chondrogenic differentiation.Objective: To assess the practicability of a cryopreserved HAM as a scaffold in cellproliferation and differentiation in vitro.Materials and Methods: In this experimental study, adipose tissue samples wereharvested from the inguinal region of male patients aged 15-30 years. Flow cytometrywas used to identify CD31, CD45, CD90, and CD105 markers in adipose stemcells. HAM was harvested from donor placenta after cesarean section, washed,trypsin-based decellularized trypsinized decellularized, and used as a scaffold viathree methods: 1) ADSCs were differentiated into chondrocytes on cell culture flasks(monolayer method), and after 14 days of culture, the cells were transferred and culturedon both sides of the HAM; 2) ADSCs were cultured and differentiated directly on bothsides of the HAM for 14 days (scaffold-mediated differentiation); and 3) chondrocyteswere differentiated with micromass culture for 14 days, transferred on HAM, and tissueslides were histologically analyzed qualitatively.Results: Flow cytometry confirmed the presence of mesenchymal stem cells.Histological findings revealed that the cells adhered and grew well on the stromal layerof HAM. Among the three methods, scaffold-mediated differentiation of ADSCs showedthe best results.Conclusion: ADSCs have excellent attachment, viability, and differentiation capacity inthe stromal side of HAM. Additionally, the direct culture and differentiation of ADSCson HAM is more suitable than the culture of differentiated cells on HAM.

کلمات کلیدی:

Amniotic membrane, Scaffold, Chondrogenesis, Differentiation, Mesenchymal stem cell