

# Surgical sutures filled with adipose-derived stem cells promote wound healing

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Delayed wound healing and scar formation are among the most frequent complications after surgical interventions. Although biodegradable surgical sutures present an excellent drug delivery opportunity, their primary function is tissue fixation. Mesenchymal stem cells (MSC) act as trophic mediators and are successful in activating biomaterials. Here biodegradable sutures were filled with adipose-derived mesenchymal stem cells (ASC) to provide a pro-regenerative environment at the injured site. Results showed that after filling, ASCs attach to the suture material, distribute equally throughout the filaments, and remain viable in the suture. Among a broad panel of cytokines, cell-filled sutures constantly release vascular endothelial growth factor to supernatants. Such conditioned media was evaluated in an in vitro wound healing assay and showed a significant decrease in the open wound area compared to controls. After suturing in an ex vivo wound model, cells remained in the suture and mai