Fibrinogen inhibits fibroblast-mediated contraction of collagen.

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Abstract:

Extracellular matrix changes in composition and organization as it transitions from the provisional matrix of the fibrin/ platelet plug to collagen scar in healed wounds. The manner in which individual matrix proteins affect these activities is not well established, In this article we describe the interactions of two important extracellular matrix components, fibrin and collagen, using an in vitro model of wound contraction, the fibroblast-populated collagen lattice. We utilized different fibrinogen sources and measured tissue reorganization in floating and tensioned collagen lattices, Our results showed that both fibrin and fibrinogen decreased the contraction of fibroblast populated collagen lattices in a dose-dependent manner. Polymerization of fibrinogen to fibrin using thrombin had no effect on this inhibition. Further, there was no effect due to changes in protein concentration, alternate components of the fibrin sealant, or the enzymatic action of thrombin. These results suggest that the initial stability of the fibrin provisional matrix is due to the fibrin, because this protein appears to inhibit contraction of the matrix, This may be important in the early phases of wound healing when clot stability is vital for hemostasis. Later, as fibrin is replaced by collagen, wound contraction can occur.