

muscle physiology lecture 18

cellular steps of healing.

proteoglycans - core protein covalently attached to one or more glycosaminoglycan chains.
connective tissue. combines with collagen to form cartilage, modulation of cellular development.
glycoproteins - oligosaccharide chains covalently attached to proteins. cell surface. cell-to-cell
recognition and signaling. may or may not be negatively charged. collagens, mucins, etc.
among the components of blood and lymph - fibrinogen, fibronectin, prothrombin
bleeding causes platelets to show up and produce more thrombin. thrombin converts
fibrinogen into fibrin. no shortage of fibrin @ the injury site. platelets - thrombocytes.
stage 1 - enzymes (prothrombinase and thromboplastin) convert the prothrombin to
thrombin in the presence of calcium. stage 2 - thrombin is an enzyme that converts
fibrinogen into fibrin (stage 3) with the presence of fibronectin in our blood.
fibrin and fibronectin is our cross link where platelets attach themselves onto fibrin.
insoluble fibronectin is in the extracellular matrix and soluble fibronectin is
a major component of blood plasma. platelets adhere to exposed ECM via von
Willebrand factor and become activated, which makes them change shape
and begin degranulating. the matrix is a hub for chemotactic signaling.

1. injury & blood and lymphatic vessels are disrupted.
2. few macrophages in the area already
3. platelets are first responders.
4. both secrete pro-inflammatory cytokines.
5. vascular endothelium starts to leak.
6. leak causes swelling - not the same as inflammation.
7. leak allows migratory immune cells into the area.
8. incoming cells (first: neutrophils) show up via chemotaxis.
9. platelets and macrophages are both responsible for chemotaxis.
10. leakiness caused by - cytokines, complement proteins (sensitive to heat), the kinin system - stimulates local cells to generate cytokines, nitric oxide, tachykinins, nitric oxide - powerful vasodilator, prostaglandins.

fibroblasts - most common cell in connective tissue, cells that synthesize progenitor cells, not quite stem cells
to heal - need cells, blood, tissues need to be touching, mechanical stress