Effects of Thrombopoietin (TPO) on Longitudinal Mouse Hind Limb Crush Injury Model

Greg Rothchild[1], Kelsey Lipking[1]; Todd McKinley[2], Melissa A. Kacena[2], and George E. Sandusky[1]
[1]Department of Pathology, and
[2]Department of Orthopaedic Surgery, IU School of Medicine

Approximately 645 people suffer from blunt force trauma injury to the femur every day. The recovery time of such injury can last anywhere from 3-6 months. Thrombopoietin (TPO) was used as a growth factor to induce bone and muscle healing. In this study, nine separate mouse groups (10 mice per group) were used: Crush PBS, Crush TPO, Surgery PBS, and Surgery TPO at day 3 and day 17, and controls with no surgery/crush/treatment. Skeletal muscle was harvested from the following sites: experimental impact, experimental adjacent, and normal contralateral skeletal muscle as a control. The muscles were fixed, processed, sectioned, and stained with H&E and Massons Trichrome stains. The slides were reviewed for skeletal muscle injury, muscle necrosis, inflammation, muscle repair, and regeneration. In addition, F4/80, an immunostain for macrophages was performed. On microscopic examination at day 3 the most common histologic changes seen were sporadic muscle fiber vacuolation, focal necrosis of varying sizes, muscle contraction bands, and infiltration of macrophages. On day 17, the skeletal muscle injury was generally healed. The main histologic lesions seen were variable sizes of muscle fibers, early fibroplasia, fat infiltration, some macrophages, satellite cells, and neovascularization. Comparing the TPO treated mice versus the PBS control group, the lesions at both time points were less in the TPO treated mice.

Mentor: George E. Sandusky, Department of Pathology, IU School of Medicine, IUPUI