

## Local Infiltrative Analgesia of Murine Femur Fractures in Vivo Does Not Inhibit Fracture Healing

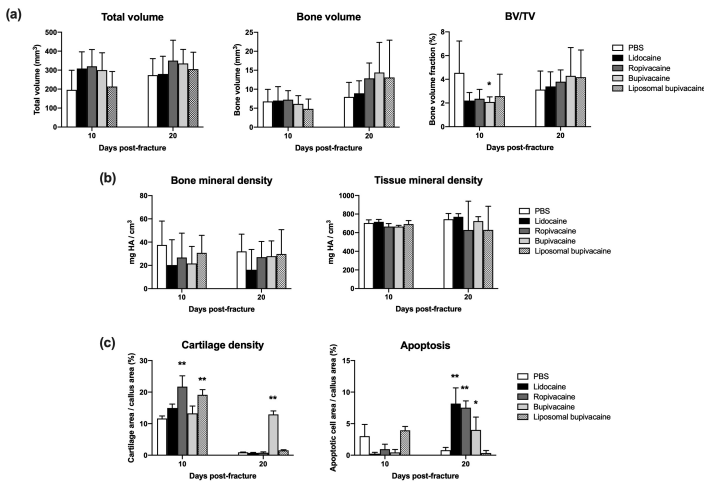
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**Purpose:** The opioid epidemic in the United States, recently declared a national public health emergency, has forced physicians to seek out alternatives to narcotic analgesics. These are of particular interest to orthopaedic trauma surgeons, whose patients often require significant amounts of these medications given the acuity and severity of their injuries, especially in the perioperative period. Modalities such as local infiltration of fractures with anesthetic agents during operative treatment may provide some benefit in this population. However, prior data suggest that these agents are chondrotoxic, which may impede secondary fracture healing.

**Methods:** Male C57BL/6 mice underwent intramedullary stabilization and fracture of bilateral femurs followed by immediate infiltration of the fracture site with local anesthetic agents. Femurs were dissected at 10 and 20 days post-fracture and evaluated by micro-CT and histological analysis.

**Results:** No significant differences were seen in callus size or mineralization between controls and fractures treated with local anesthetic when evaluated by micro-CT. When the callus was analyzed histologically, longer-acting agents increased cartilage density while shorter-acting agents increased cellular apoptosis.

**Conclusion:** Infiltration of local anesthetics during operative treatment of fracture as part of a multimodal approach to pain control does not appear to significantly affect callus formation in a preclinical model. However, these agents may influence the extent of cartilage formation and chondrocyte apoptosis within the callus itself.



(a) CT analysis of total volume, bone volume, and bone volume fraction of callus formation of fractured mouse femurs after treatment with local anesthetic. \* =  $p < .05$ . (b) CT analysis of callus mineralization of fractured mouse femurs after treatment with local anesthetic. (c) Histological quantification of cartilage and apoptotic cellular density within the fracture callus. \* =  $p < .05$ . \*\* =  $p < .01$ .