

Abstract of proposed student project (1 page limit. This should mirror the aims page of a grant and CLEARLY indicate the student's role.)

INTRODUCTION: Limb deformity correction typically requires cutting bone (creating an osteotomy) then stabilizing the bone fragments in appropriate orientation. Osteotomies are usually performed using a direct open surgical approach with a power saw. This is therefore an invasive process and can be associated with moderate regional tissue damage from tissue dissection.

Recently, percutaneous (or 'keyhole') osteotomies have gained popularity in human orthopedic surgery, particularly for foot and ankle procedures. The bone does not need to be exposed; rather, a specialized burr is inserted through a small stab incision, which is used to perform the osteotomy.

We believe these specialized drill systems can be used to perform percutaneous osteotomies in small animals, since the size of the bones commonly affected by limb deformity are comparable to human foot and ankle bones. Percutaneous osteotomies may decrease surgical time and local tissue trauma for animals undergoing limb deformity correction.

METHODS: Medium sized cadaver dogs (n=7) will be used. Limbs will be randomly allocated to receive a percutaneous osteotomy (Burr group), with the contralateral limb receiving a standard osteotomy through an open approach with a sagittal saw (Saw group). For the Burr group, after creation of a small stab incision and regional epiperiosteal dissection, percutaneous cutting burrs will be inserted and used to create transverse osteotomies of the distal metaphysis of the antebrachium (radius/ulna), distal diaphysis of the femur, and distal diaphysis of the tibia. For the Saw group, a standard open surgical approach will be made and osteotomies will be created using a sagittal saw.

Surgical times will be recorded, and difficulty will be subjectively graded using a Likert scale. Specimens will be dissected and photographed. The osteotomy will be inspected and scored for smoothness. The orientation of the osteotomy will be quantified relative to the long axis of the bone. Regional damage to the surrounding musculature and neurovascular structures will be subjectively graded as none, mild, moderate, or severe.

Data will be summarized using descriptive statistics. The outcomes measures (surgical time, osteotomy orientation, smoothness, difficulty, tissue damage) Burr and Saw groups will be compared using pairwise analyses such as paired t-tests and Wilcoxon

ANTICIPATED RESULTS: We anticipate that percutaneous osteotomies will have lower regional tissue damage with comparable accuracy when compared to osteotomies performed with a saw.

FVSP Student involvement: Data collection, manuscript preparation with targeting publication as first author in peer-reviewed veterinary journal.