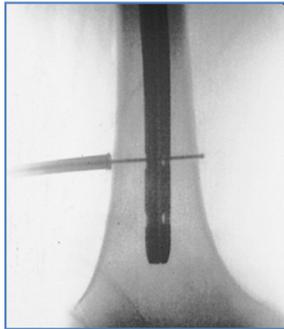


platform technology for dynamic imaging in Orthopedic Surgeries

PI: Roy Gigi, MD –Principal Investigator, Senior Orthopedic Surgeon

Background- Long Bone Diaphyseal Fractures

Long Bone Diaphyseal Fractures are extremely common injuries in children, adults and elderly. Intramedullary nailing is the criterion standard for treating those fractures. The nail is located in the intramedullary cavity. In order to prevent backing out and adding additional stability to the nail, the nail is fixed with small screws that pass through holes which are located at both ends of the nail. The surgeons are using fluoroscopy to find the distal hole and then they try to strike the screw in the middle of it.



The Problem- Accurate Targeting To the Distal Holes in the Nail

The final and most complicated stage of the nailing surgery is locking the distal hole of the nail. When the nail is inside the bone the distal hole is invisible and thus hitting in the middle of it is extremely complicated. To determine the spatial location of the distal hole the surgeon uses a great amount of 2D fluoroscopic images. When taking fluoroscopic images the medical staff is exposed to a great amount of radiation, 30-51% of all fluoroscopic images taken during the intramedullary (IM) nailing procedure are for the distal screw locking.

The Invention- Euphony- IM Nail with Embedded Echogenic Markers

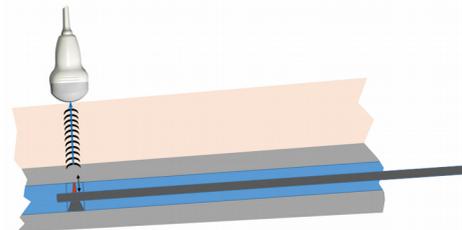
Surgical apparatus, comprising a transducer that is inserted into the cavity of the nail when inside the broken bone. The pusher head of the transducer is located in the distal hole of the nail and engaging the inner wall, this creates acoustical modulation. Using a simple Doppler device the surgeon can localize the trajectory and target point of the nail fixation hole from an extracorporeal location.

Advantages:

- ✓ Accurate – “single shot”
- ✓ No exposure to X-ray radiation
- ✓ Uses existing ultrasound systems common in orthopedic operating rooms.
- ✓ Fits different nailing sizes and different systems brands.
- ✓ Simple to use and short learning curve.
- ✓ Transmitting from the Inside –to the Outside.

What's done so far?

- ✓ Detailed mechanical and electrical design
- ✓ Production of prototypes
- ✓ In-vitro and in-vivo testing



Intellectual Property

Pending patent application.