

Case Presentation: Distraction Osteogenesis

Dan Hampton, M.D.

20 year old male presents with right hand amputation after meat grinder accident in a commercial meat processing plant.



Initial image at presentation



Hand surgically reattached
POD 6

POD 11



Distraction Osteogenesis



Gavriil Abramovich Ilizarov



Ilizarov Technique

- Osteotomy created that preserves periosteum as much as possible
- Proximal and distal fixation blocks typically secured with some combination ring fixators, wires, and/or pins
- Distraction is slow, with approximately 0.5mm of separation per day
- Two basic types

Distraction Osteogenesis

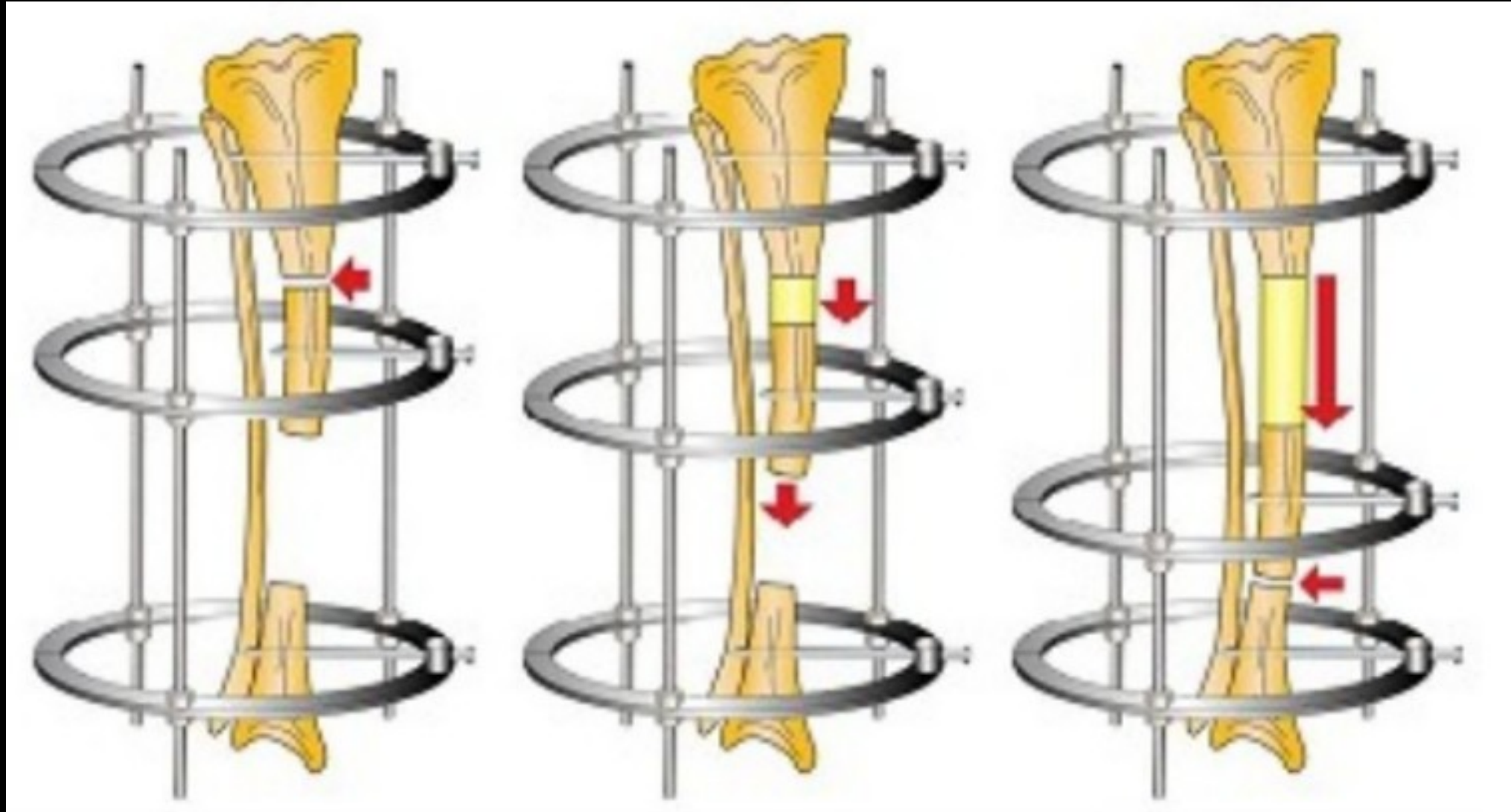
Intercalary Transport

- A bone fragment is moved from the proximal fixation site to the distal docking site (or vice versa)
- Does not lengthen the soft tissues
- Proximal fixation block and distal fixation block are stationary
- Useful for complex fractures with devitalized bone

Non-intercalary Transport

- The distal fixation block is moved relative to the proximal fixation block
- Stretches soft tissue and results in lengthening of the extremity
- Can apply tension in reverse direction to treat non-union

Intercalary Transport



Non-Intercalary Transport

POD 11

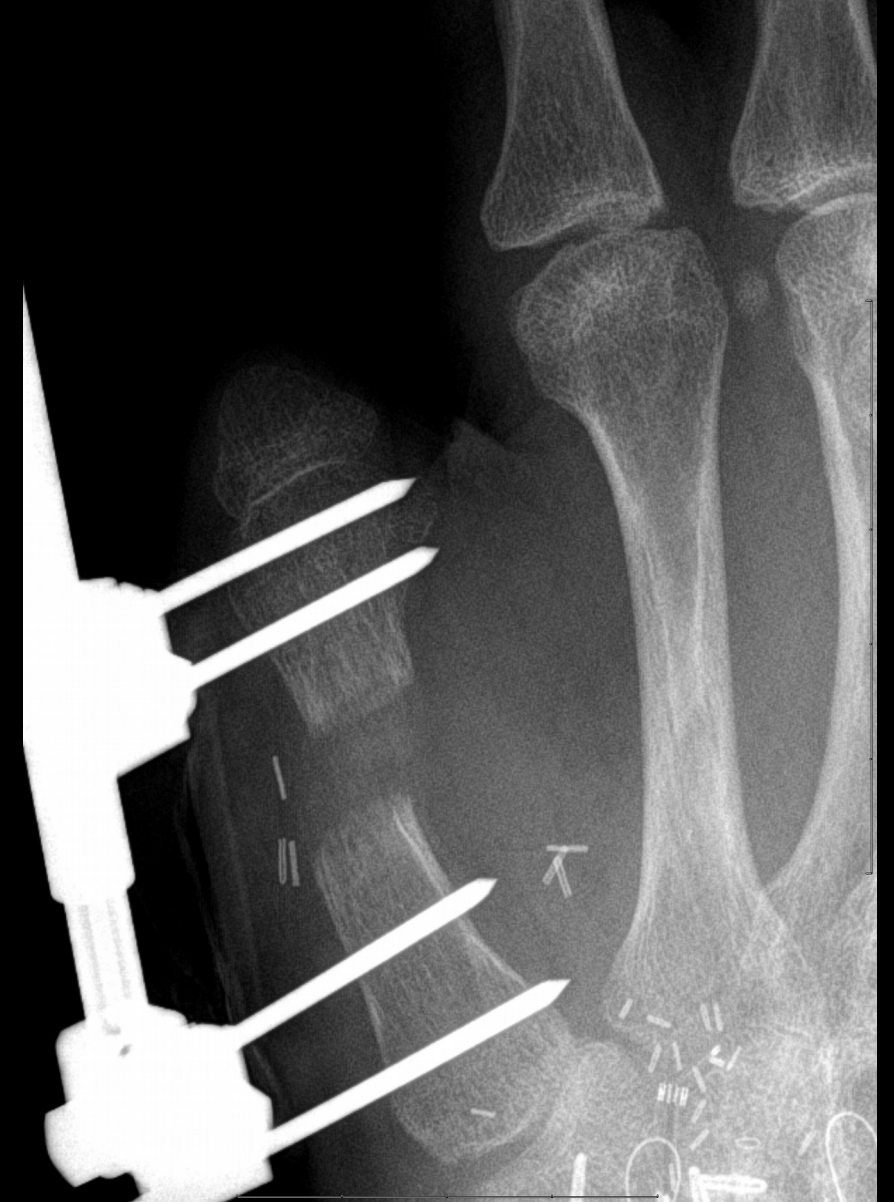
POD 25

POD 39

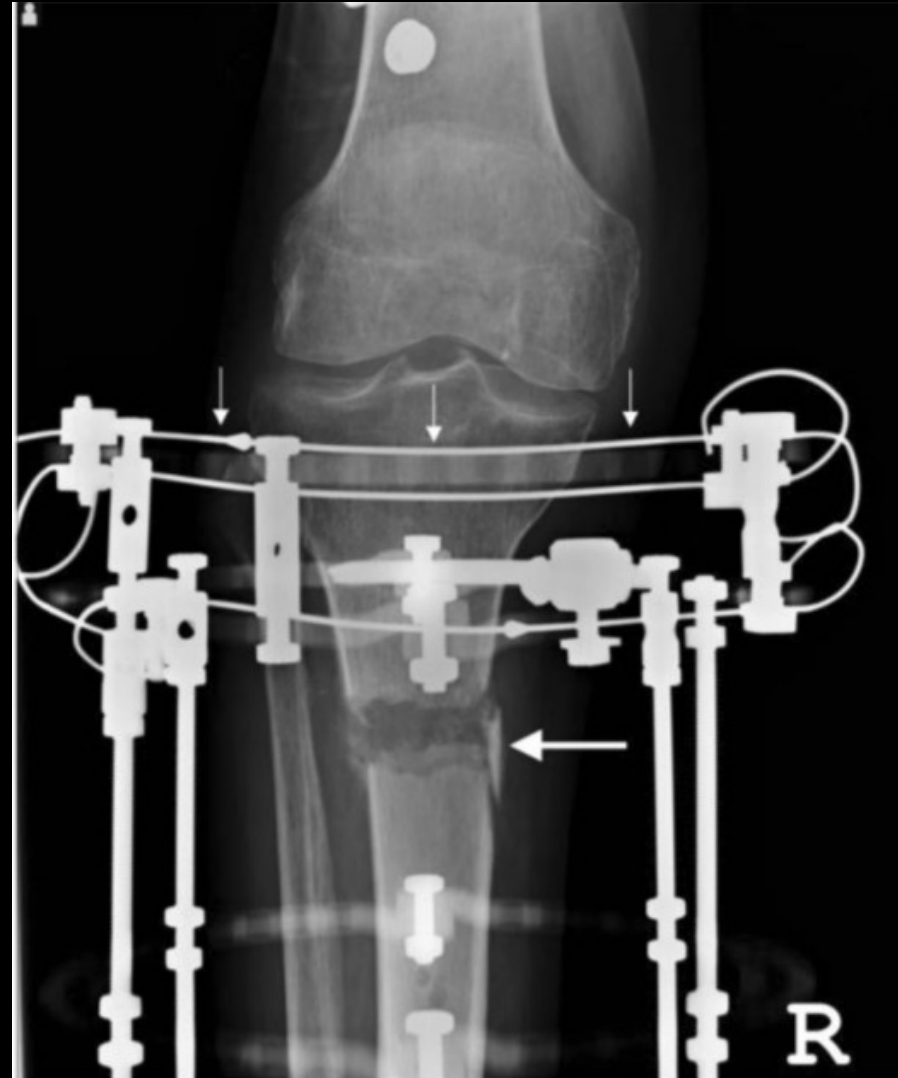
POD 53



POD 53



Complications



Complications



Additional Complications

- Infection
- Nonunion at docking site
- Over lengthening
- Soft tissue injury, particularly with lengthening

References

Tresley J, Schoenleber SJ, **Singer AD**, Clifford P. “Ilizarov” External Fixation: What the Radiologist Needs to Know. *Skeletal Radiol Skeletal Radiology* 44.2. 2015. 179-95.

Murray JH, Fitch RD. Distraction histiogenesis: principles and indications. *J Am Acad Orthop Surg*. 1996;4(6):317-27.