



Metacarpal Fractures in Athletes

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Disclosures

None of the faculty for this educational activity have relevant financial relationships with ineligible companies to disclose.

Metacarpal fractures in athletes

- Metacarpal fractures are common in athletes.
- In most cases conservative therapy is indicated. Some deformity is usually acceptable.
- Significant shortening, angulation or especially rotation may cause loss of function.



Metacarpal fractures in athletes

- Athletes with precision requirements for grip and handling may be an exception.
- In vitro testing has demonstrated that the length tension relationship of the flexor and extensor tendons changes significantly with shortening more than 2 mm.
- This is because the FDP tendons and the extensor tendons are significantly tethered to each other and they cannot adapt by shortening with the bone.
- For pitchers, basketball players, racquet sport athletes, throwers and others that require fine motor skill or precision heavy grip I will consider fracture repair with less deformity.

Metacarpal fractures in athletes

- Plating has been the gold standard for metacarpal fracture repair for decades.
- Plating is frequently complicated by stiffness. I advise my patients that it is usually a two-stage surgery. ORIF followed by HWR and tenolysis once the fracture has healed.
- Plating can be surprisingly challenging. The proximal half of the metacarpal has a ridge dorsally and then transitions to a flat surface distally.

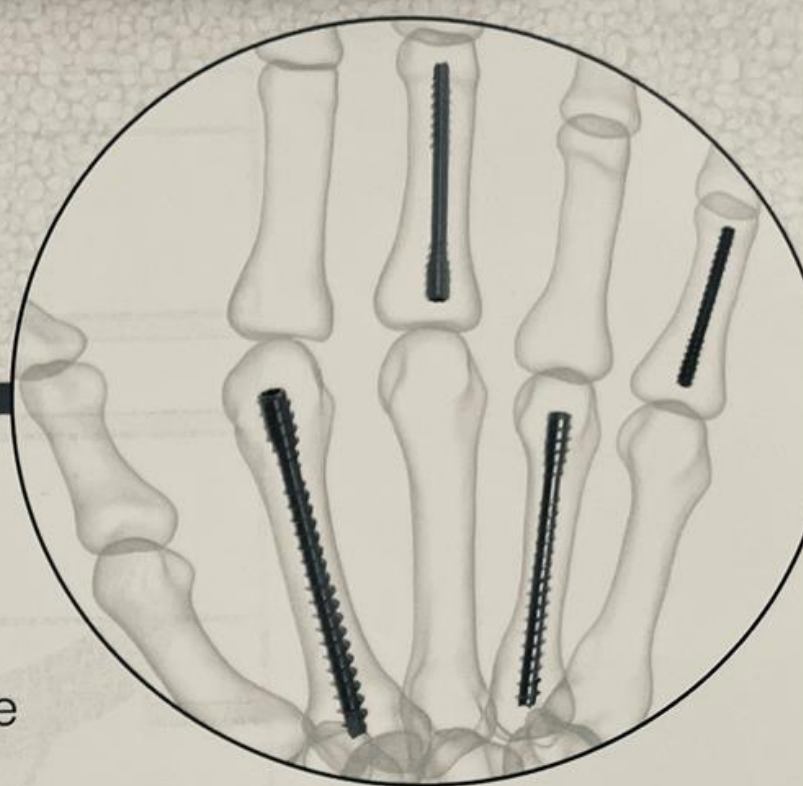
Metacarpal fractures in athletes

- Intramedullary fixation is rapidly becoming more popular.
- Because the hardware is not in direct contact with the tendons, stiffness is less of a problem.
- Comparison studies have demonstrated better range of motion with intramedullary fixation versus plating.
- Decreased need for second surgeries (hardware removal and tenolysis) has also been demonstrated. This corresponds with my personal experience.

THREADED HAND NAIL

Enabling surgeon-controlled
hand fracture repair

Optimized thread design balances nail purchase
and canal fill with lower insertion torque



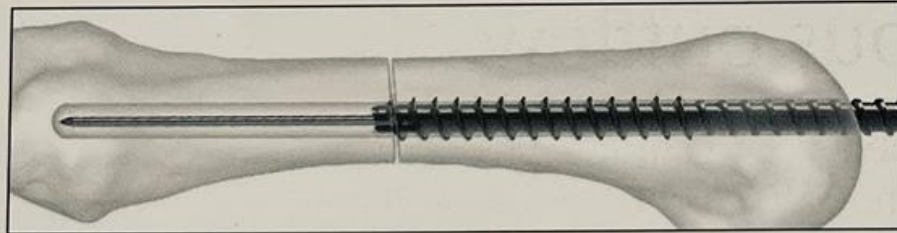
TRAILING THREAD
Engineered pitch differential
intended to counteract fragment
distraction to achieve reduction

TRANSITION ZONE
Balances canal fill,
nail strength,
and insertion torque

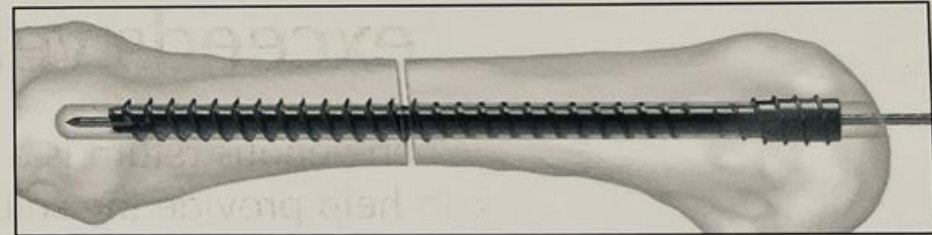
LEADING THREAD
Leading thread and tip
designed to minimize
fragment distraction

Net Zero Compression™ designed to minimize gapping
across the fracture site while avoiding over-compression

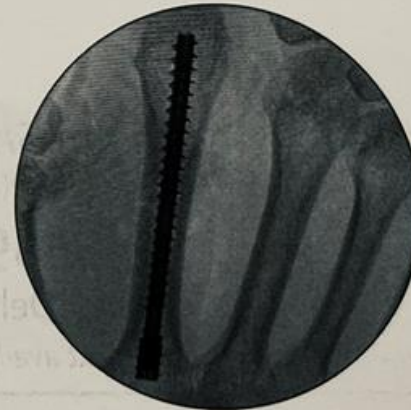
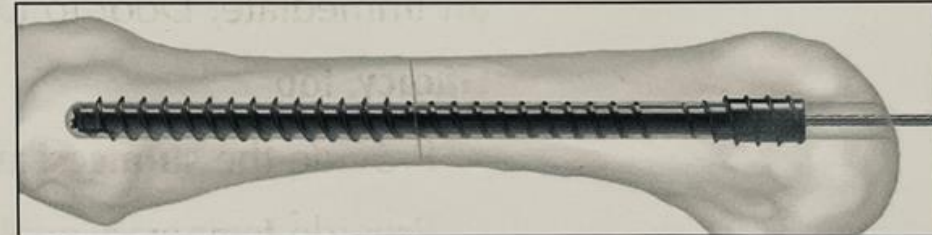
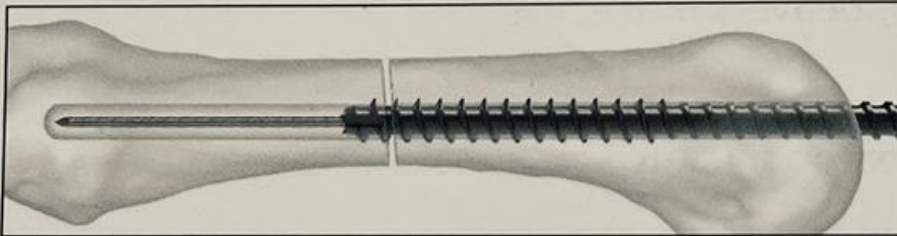
Net Zero Compression™ designed to minimize gapping across the fracture site while avoiding over-compression



Potential distraction as Nail crosses fracture line



Compensatory translation closes gap with Net Zero Compression™



skeletal dynamic

Metacarpal fractures in athletes

- Technical pointers:
- Starting point is in the dorsal third of the metacarpal head.
- The majority of the reduction must be achieved before the screw is inserted. This is especially true for shortened or comminuted fractures. Double skin hook to regain length.
- Placed the hand in a full fist position to control rotational deformity.
- For noncomminuted fractures apply slight longitudinal pressure as the screw crosses the fracture site to prevent gapping.



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HAND
Exam Date:
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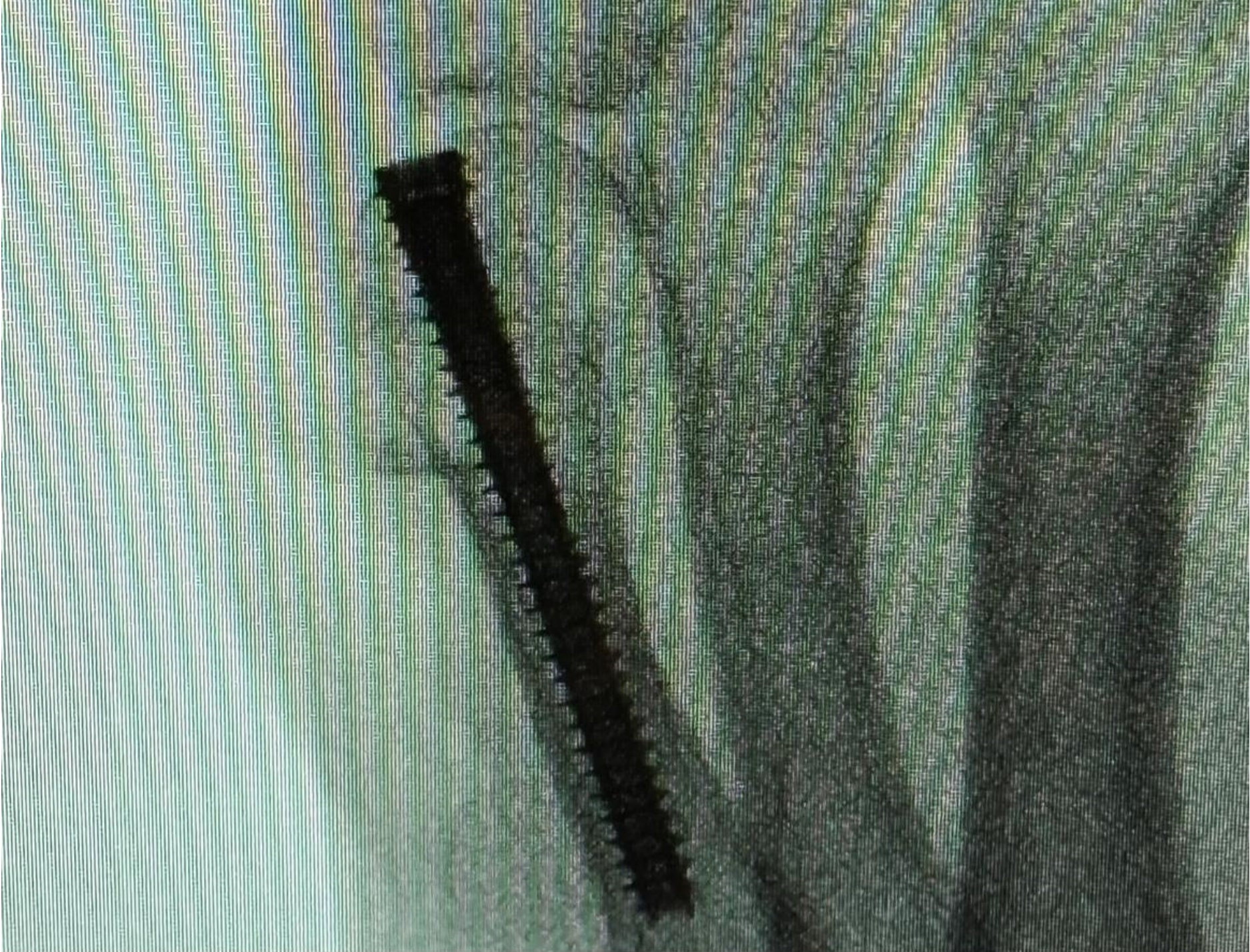


Metacarpal fractures in athletes

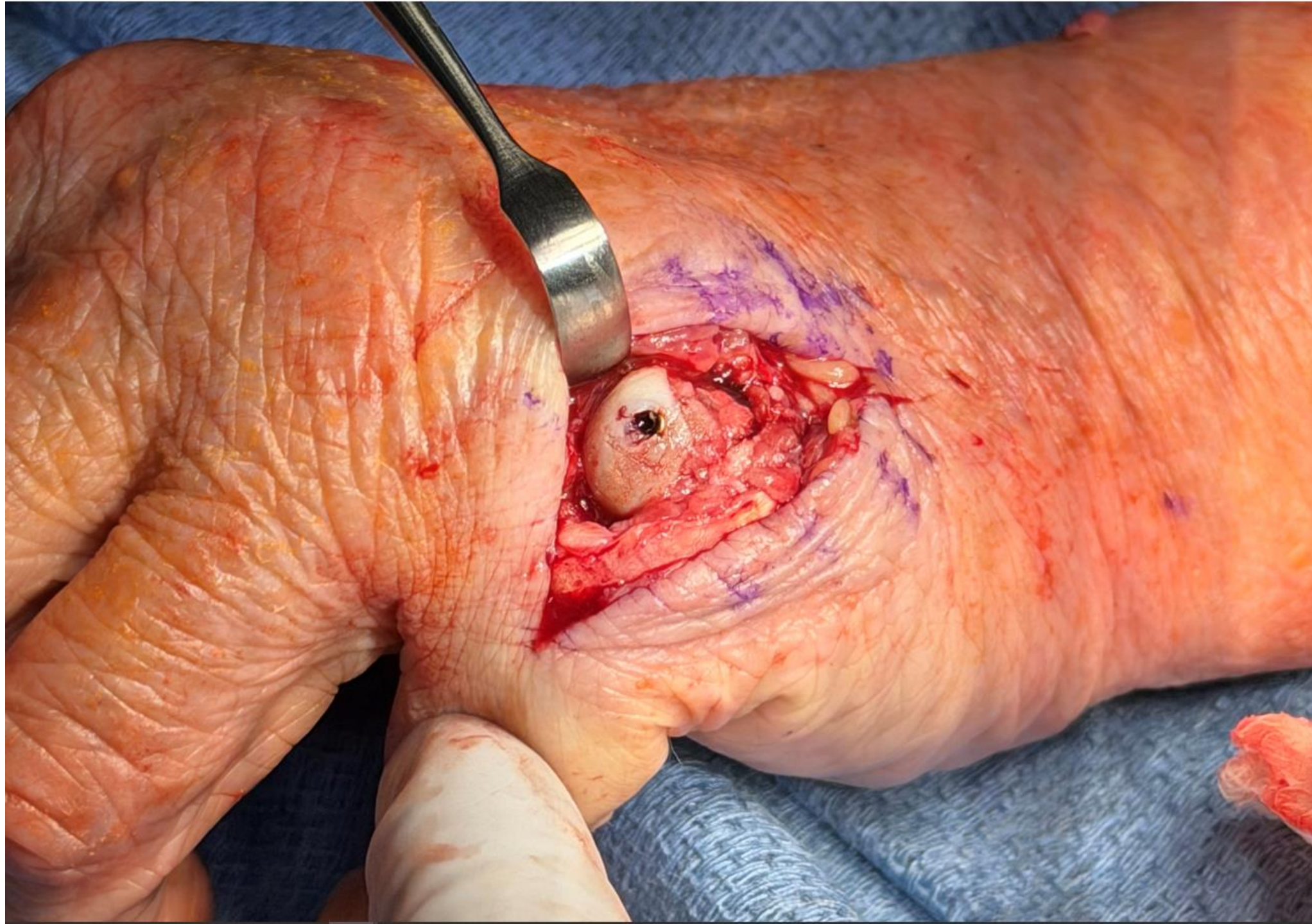
- Distal fractures can also be managed with intramedullary fixation.
- This is attractive because of the very limited surface area available for fixation.
- I would recommend slightly over drilling the hole in the distal fragment to avoid splitting the fragment.
- I have used standard headless compression screws because they have a tighter thread pattern for fixation in the small distal fragment. You do have to be careful about over compressing.











Metacarpal fractures in athletes

- Intramedullary fixation has the additional advantage of less hardware prominence with open fractures while still allowing early motion.
- Plate fixation demands adequate soft tissue coverage of the plate dorsally which can be challenging because of the thin subcutaneous tissue and relatively thin dermis on the dorsum of the hand.

92M Hand Crush with Log



Metacarpal fractures in athletes

- Return to sport: Dr Ayalon describes letting a professional basketball player dribble and shoot within 7 days. “It feels like nothing happened.”
- This is too aggressive for me. I focus on range of motion only until I see radiographic healing. Hardware failure can cause an intra-articular split of the metacarpal head which is a very difficult problem.

Thank you