Are Two Plates Better?
Thomas Jones MD
Palmetto Health USC Orthopedic Center

- High-energy mechanism supracondylar femur fractures are often associated with:
  - Severe soft tissue injury
  - Extensive articular and metaphyseal comminution
  - Occasionally segmental bone loss
- These factors are a set up for prolonged healing time.
- Previous generations of implants used in isolation were associated with fixation failure, varus collapse, and nonunion.\textsuperscript{1,2,3}
- Supplemental medial fixation has been advocated by previous authors to improve stability.\textsuperscript{1,3,4}
- Laterally based locking implants showed improved union rates, but these were not without their failures.
  - Those that failed tended to be those high energy fractures with compromised soft tissues, severe comminution, or bone loss.\textsuperscript{5,6,7}
- An option to improve bicolumnar stability is the addition of a medially based plate in conjunction with a laterally based, modern locking implant.\textsuperscript{8,9}
- At our center, we have begun percutaneously dual plating high energy supracondylar femur fractures, especially those with segmental bone loss.

Surgical Technique

- Articular reduction completed first
- Anatomic length, alignment, and rotation assessed using the contralateral side (if possible)
- Articular segment secured to diaphysis using MIPO with a laterally based, modern, locking implant
- Medial distal femur approached, distal and anterior to adductor tubercle
- Vastus medialis retracted anteriorly, Sartorius fascia retracted posteriorly
- Cobb elevator used to bluntly dissect along medial border of femur
- A plate is contoured to fit the patients’ medial femoral anatomy (typically small fragment plate, 14-18 holes)
- Plate slid in submuscular fashion along the medial border of the femur
- Plate secured to distal block
- Proximal aspect of the plate localized using fluoroscopy
- Accessory incision made along the medial border of the thigh
Dissection is carried through the compartment of the vastus medialis

- The approach uses the sartorial fascia and floor of vastus medialis to protect neurovascular bundle

- Plate is then affixed to the proximal medial femur
- The remaining bone void is filled with antibiotic impregnated PMMA cement spacer
- PT begun immediately
- Patients eligible for spacer removal and bone grafting at 4 weeks

Results

- Identified 11 patients
  - One developed persistent infection and went on to AKA
- Assessed healing on 10 patients
  - Average bone loss = 8.7 cm
  - Average tibiofemoral angle = 6 degrees of valgus
  - Average arc of motion 106° (3 > 125°)
  - 8 went on heal without additional, unplanned surgery
  - 1 required revision surgery to IM nail with repeat bone grafting
  - 1 patient lost to follow-up

Discussion

- Supracondylar femur fractures with significant bone loss present a unique challenge
- These fractures often require prolonged time to union
- This places laterally based fixation at increased risk for varus collapse and failure
- Medial column support can be added in a minimally invasive manner, thus adding stability while minimizing additional insult to the soft-tissue envelope
- This treatment algorithm can serve as a valuable tool for surgeons charged with management of these difficult injuries

References


