Case Report
Temporary Fixation Using a Long Femoral-tibial Nail to Treat a Displaced Medial Tibial Plateau Fracture in a 90-year-old Patient: A Case Report

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Learning Points for this Article:
A long femoral-tibial nail is a useful temporary fixation for displaced tibial plateau fractures in the very elderly with poor soft tissue cover.

Abstract

Introduction: Tibial plateau fractures are complex injuries in the elderly population. When traditional methods of fixation are not suitable, an alternative method needs to be chosen for a favorable outcome. We demonstrate a previously undescribed treatment for displaced tibial plateau fractures in the very elderly with poor soft-tissue integrity.

Case Report: A 90-year-old woman suffered an open, Gustilo Grade IIIA, displaced fracture of the tibial plateau. An intramedullary knee arthrodesis, the femoral-tibial nail was used to temporarily stabilize her fracture. She was able to weight bear immediately postfixation.

Conclusion: A long femoral-tibial nail allows favorable fracture and soft tissue healing, ease of nursing and immediate full weight-bearing. It shows good promise and should be considered as a management option when traditional methods are not applicable in select patients.

Keywords: Tibial plateau fracture, Elderly, Arthrodesis, Femorotibial nail.

Introduction
Tibial plateau fractures in the elderly are complex injuries that represent around 1% of all fractures and 8% of total fractures in persons above 65 years of age [1]. The choice of treatment is dictated by the severity of soft tissue injury, degree of articular depression and displacement, mechanical malalignment, age and mobility of the patient, systemic comorbidities, and skill of the operating surgeon [2]. The chosen treatment should primarily allow full and early weight-bearing since immobilization can lead to systemic complications and an increased hospital stay [1, 3].

Case Report
A 90-year-old woman presented with a left leg injury after a fall from standing. She has a background of osteoarthritis and osteoporosis and normally mobilized with a walking stick. On examination, her soft tissues were very friable, and there was a 10 cm full-thickness laceration over the fracture site. The radiograph (Fig. 1) showed a displaced medial condyle, Schatzker Type 4 fracture with 15 mm displacement, condylar widening of 12 mm, articular step-off of 6 mm, and varus malalignment of 7°.

The options for treatment of this Gustilo Grade III open fracture were considered. Plaster cast would not allow for easy wound management or weight-bearing and risks nonunion, pressure sores, and venous thromboembolism/chest sepsis. Plate fixation in osteoporotic bone risks early failure, and again nonweight-bearing was deemed too risky to the patient’s general health. Circular external fixation is challenging for the very elderly. Primary stemmed arthroplasty was discounted due to the open wound and the tibial tuberosity fragment. An arthrodesis nail was considered the best option to allow minimally invasive stabilization, soft tissue management, and immediate full weight-bearing postoperatively.

The patient was positioned supine on a pelvic traction table, and the wound was washed and debrided. After freehand reduction, a long hip to ankle anterograde intramedullary nail was inserted from the greater trochanter through the knee to just proximal to the ankle, with the knee joint fixed in 10° flexion. The femoral-tibial mechanical axis was restored to within 5° of the unaffected limb (Fig. 2) and closed primarily. The skin edges were preserved and skin flaps repaired with...
treatment of choice for failed total knee arthroplasty and reconstruction after
In recent years, knee arthrodesis using long femoral-tibial nail has become the
dressing for the fracture to heal. Again, not a viable option.
Non-operative methods are used only for minimally displaced fractures [9]. A
tibial tuberosity was a separate fragment.
Arthroplasty was not considered as the risk of infection was too high, and the
was not a feasible treatment option.
The standard treatment of tibial plateau fractures is an open reduction and
internal fixation (ORIF) with plate fixation. ORIF provides good fracture
reduction and stability. However, there are data lacking on its use for very
elderly patients with poor skin integrity. Soft tissue infection and wound
necrosis are likely complications of ORIF in the elderly [5] and would have
prevented its use in this case. Furthermore, the risk of construct failure on
weight-bearing in osteoporotic bone is recognized in elderly patient fracture
fixation.
An alternative is the use of an external fixator, but this is generally not well
tolerated and results in poorer outcomes in elderly patients [6]. In very
osteoporotic bone, it is often associated with pin-tract infection, loosening,
and pin site fracture [7]. Complication rates can be as high as 80% using this
treatment [8]. Due to the patient’s severe osteopenia and tissue damage, this
was not a feasible treatment option.
Arthroplasty was not considered as the risk of infection was too high, and the
tibial tuberosity was a separate fragment.
Non-operative methods are used only for minimally displaced fractures [9]. A
cast brace for this patient would not have allowed immediate full weight-
bearing, and the condition of the soft tissues would have necessitated regular
dressing for the fracture to heal. Again, not a viable option.
In recent years, knee arthrodesis using long femoral-tibial nail has become the
treatment of choice for failed total knee arthroplasty and reconstruction after
Intraoperative risks such as intraarticular cartilage and ligament damage exist
where the reamers and nail cross the knee. Even after the nail is removed, some
percentage of knee range of movement would be permanently lost due to
intracapsular adhesions and extra articular contracture. However, safely
managing the soft tissues and allowing early rehabilitation with lower limb
trauma remain the goals in this instance, and the long nail allowed for this.
Conclusion
A long femoral-tibial nail is a useful temporary fixation for displaced tibial
plateau fractures in the very elderly with poor soft tissue cover. It permits
favorable fracture and soft tissue healing, ease of nursing care, and permits
immediate full weight-bearing. Further studies are needed to better define the
indications, assess functional outcome, and complication rates of this treatment
modality.
Clinical Message
In the very elderly, displaced tibial plateau fractures are not always
amenable to standard treatments. In the right patient group, a long femoral-
tibial nail could provide a temporary fixation for this to improve a number of
clinical outcomes.
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