

## Is Septic Knee Arthritis a Realistic Concern Following Suprapatellar Nailing of Open Tibia Fractures?

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**Background/Purpose:** The use of an intra-articular suprapatellar entry portal has been proposed as an alternative approach for tibial nail placement. The suprapatellar portal requires a knee arthrotomy and passage of surgical instrumentation within the knee joint. In the setting of an open fracture, the knee is potentially exposed to tissue and fluid that have been in contact with the open fracture site. This exposure may increase the risk of postoperative knee sepsis. An intra-articular approach through the knee has been reported as safe for retrograde nailing of open femur fractures. Compared to open femur fractures, open tibia fractures have a higher rate of postoperative infection, yet no study has evaluated the safety of the suprapatellar approach in open tibia fractures. We sought to determine if suprapatellar nailing of open tibia fractures placed the knee at risk for septic arthritis.

**Methods:** We identified all open tibia fractures (OTA/AO 42) at two Level I trauma centers treated with a medullary nail through a suprapatellar entry portal from 2009 to 2015 via CPT code and chart review. We included all fractures in patients aged 18 or older and excluded any treatment of pathologic fractures and those patients with less than 12 weeks of clinical follow-up. Patient demographic, injury, and initial management information was recorded. The primary outcome measure was evidence of culture positive infection from a knee aspiration or surgical arthrotomy and the need for a secondary procedure(s) to clear the septic arthritis. Secondary outcome measures were entry portal cellulitis/superficial infection, later infection of the open fracture site or medullary canal, and need for reoperation for any reason.

**Results:** We identified 162 patients with 165 fractures. After exclusion criteria, 84 patients with 87 fractures remained for analysis. There were 15 women and 69 men with a median age of 38 years (range, 18-84). There were 2 cases of septic arthritis (2.2%). There were 11 total infections (12.6%), of which 3 (3.4%) were deep. 29 fractures (33.3%) required reoperation for any reason. One case of septic arthritis occurred after a deep infection. In the other, the patient fell and sustained a new wound that later developed an infection.

**Conclusion:** The intra-articular suprapatellar entry portal for tibial nail placement theoretically exposes the knee joint to contamination from the open fracture site during tibial canal preparation and nail insertion. In this large consecutive series of eligible patients from two

	Number
<b>Gender (male)</b>	<b>69 (82%)</b>
<b>Median Age (years)</b>	<b>38 (18 - 84)</b>
<b>Gustilo-Anderson</b>	
Type I	21 (24%)
Type II	24 (28%)
Type IIIa	25 (29%)
Type IIIb	8 (9%)
Type IIIc	2 (2%)

The FDA has stated that it is the responsibility of the physician to determine the FDA clearance status of each drug or medical device he or she wishes to use in clinical practice.

urban Level I trauma centers, we found that the risk of associated knee sepsis from this technique is rare. However, when an infection develops at the open fracture site or within the medullary canal, the risk of knee sepsis is real. Based on the information presented, we believe that the suprapatellar approach can be used safely for treatment of most open tibia fractures following a thorough debridement and irrigation of the open fracture site. In the setting of grossly contaminated open fractures, consideration should be given to the small, but present, risk of iatrogenic septic arthritis.