

Infection in Implant Failure: Two Cases with Different Management Strategies from Infected Cephalomedullary Nails to Two-Stage Total Hip Arthroplasty

Vasiliki Lakka MD¹, Panagiotis Panagakis MD¹, Panagiotis Vossos MD¹, Anastasios Mourikis MD¹, Alkiviadis Vossos MD¹, Ilias Fanourgiakis MD¹.

1. Third orthopaedic department “KAT General Hospital “, Athens,Greece

Introduction and objectives:

Extracapsular hip fractures are commonly treated with cephalomedullary nailing. Infection rates after gamma nail fixation are generally low, from 0.6% to 3% in most series.² However, failure due to mechanical issues or occult infection presents a complex surgical challenge. We present two cases where initial nailing failed, requiring revision to two stage total hip arthroplasty.

Our aim is to highlight the importance of suspecting and thoroughly investigating infection in the setting of implant failure.

Case Presentations:

- **Case 1:** A 71year-old patient with an extracapsular hip fracture treated with a cephalomedullary nail elsewhere. Admitted under our care with pain and implant failure on x-rays about 6 months post-operatively and the suspicion of infection raised although there was no clinical evidence. The wound was well healed , there was no evidence of collection and blood tests revealed normal WBC ,CRP and very slightly increased ESR on day of admission and within normal range in previous blood tests,
- **Case 2:** A 75-year-old female with PMH of diabetes, sustained an extracapsular hip fracture after a fall and treated with a gamma nail in a district hospital. The nail converted to a hemiarthroplasty early post-operatively due to presumed mechanical failure in a different hospital. As there was no suspicion of infection, no tissue/ implant cultures were taken at that point. Subsequently, wound complications and collection led to admission to our department. The patient presented with fever, local hyperthermia, redness and a sinus tract at the surgical site and raised WBC and CRP . Wound cultures revealed Staphylococcus aureus.

Management & Results:

Both patients underwent a staged protocol. The first stage included debridement, implant removal, deep tissue and sonication cultures and antibiotic spacer implantation.

The cultures of the first patient were staphylococcus caprae positive. The second patient’s cultures identified staphylococcus aureus, leaving it unclear if infection was the primary cause of the failure or a secondary complication of the first revision.

As per infectious diseases’ advice, they received six weeks of intravenous and six weeks of oral antibiotics according to the sensitivities.

Following the eradication of infection (confirmed by clinical markers), the spacers were removed and both patients were successfully converted to Total Hip Arthroplasty (THA).

Intraoperative cultures taken from the second case during total hip arthroplasty operation, revealed Staphylococcus epidermidis.

Antibiotic therapy was adjusted accordingly, and the patient was monitored closely for the first six months postoperatively and then annually. Two and a half years post THA remains with no clinical sign of infection and normal inflammatory markers.

The first patient remains with no clinical sign of infection six months post-operatively.

Conclusions:

Persistent pain or early failure of a hip nail should always raise suspicion of infection. A two-stage revision with an antibiotic spacer remains a reliable "gold standard" for eradicating infection before definitive THR. THR after failed internal fixation provides excellent functional outcomes but carries higher risks compared to primary procedures. Surgeon vigilance is critical for the early identification of periprosthetic or peri-implant infection and comprehensive intraoperative sampling is essential for accurate diagnosis and effective management to optimize outcomes.

