Orthopedic Device-Related Infection, Does Noble Metal Play A Role?

INTRODUCTION:
Orthopaedic device-related infection (ODRI) (osteomyelitis, prosthetic joint infection) represent the worst catastrophic outcome in orthopaedic surgery. Biofilm formation and antibiotic resistance is one of the main contributing factor for ODRI. The noble metal used in our study are Gold, Silver, Palladium. Infection rate for traumatic long bone fracture range from 1% in closed low energy fracture to >30% in complex open tibia fracture.

METHODOLOGY:
A prospective cohort study was done in a tertiary center. A total of 40 patients with open fractures femur and tibia grade II and III, were recruited. All these patients underwent wound debridement and noble metal coated interlocking nail within 72 hours of trauma. Patients were given intravenous antibiotics prior to operation and until soft tissue closure or for a maximum of 72 hours, whichever is sooner. Exclusion criteria included poly-trauma patients who required damage control orthopedic intervention, and patients with vascular injury. All patients were under follow-up 2 weekly after discharged with a series of blood investigations (ESR, CRP) until no signs of infection, and 4 weekly till bony union by serial radiographs. Total follow - up was 2 years.

RESULTS:
There were no sign and symptoms of allergic reactions to the noble metal both clinically and with laboratory markers. 36 patients achieved fracture union (90%) within 3 to 13 months, the remaining 4 patients showed promising results on radiographs. No patient developed ODRI, however one patient developed soft tissue infection (stitch abscess) which resolved with oral antibiotics.

DISCUSSIONS:
Noble metal possess the property to prevent bacterial adhesion onto the implant surface thus preventing biofilm formation and thus preventing ODRI. It does not interfere with bone implant surface osseointegration and thus does not interfere with bone healing.

CONCLUSION:
Noble metal coated implant provide a good alternative to reduce infection rate in open fractures, and to achieve fracture union.

REFERENCES: