

Full Abstract Number 11320

Implant survivorship and modes of failure for proximal femoral, distal femoral and tibial reconstruction with compressive endoprosthetic osseointegration fixation

Ryland Kagan MD, Jake Adams MD, Caroline Schulman BE, Rachel Laursen BS, Karina Espana BS, Yee-Cheen Doung MD and James Hayden MD

Background: The Compress[®] uses compressive osseointegration as an alternative to traditional intramedullary fixation to decrease the rate of aseptic failure and provide fixation for short segment fixation. 10 year survivorship has been reported for distal femoral replacement and 2-9 year survivorship has been reported for proximal femoral, proximal tibial and humeral replacement but these studies were limited by the relatively small numbers.

Questions/Purposes:

- (1) What is survivorship for aseptic mechanical failure and overall failure for the Compress[®] at 1, 2, 5 and 7 years?
- (2) Is there improved survivorship based on anatomic location, proximal femur, distal femur or proximal tibial reconstruction?
- (3) Is there improved survivorship for the compress if the implant survives an initial time period?
- (4) What patient factors (age, sex, BMI, indication for use, oncologic factors) or implant factors, (total length, spindle size, anchor plug size, use of derotation pins) are associated with implant failure?

Patients and Methods:

A single center, retrospective review of patients with follow up of, range 1-27 years, mean 49.6 months treated with a Compress[®] for endoprosthetic reconstructions of the proximal femur, distal femur and proximal tibia. From 1997-2014, 133 Compress devices (72 distal femur, 48 proximal femur and 13 tibia) in 111 patients were identified. Indication for use of the Compress[®] were pediatric and adult patients requiring endoprosthetic reconstruction for oncologic bone lesions, revision arthroplasty, prosthetic joint infection, periprosthetic fracture or fracture nonunion. Primary outcome was aseptic mechanical failure of the Compress[®] device, defined as failure of osseointegration at the bone implant interface. Secondary outcomes included Compress[®] revision for any other reason, infection, and reoperation without revision of the compress.

Results:

6 (4.5%) aseptic mechanical failures of the Compress[®] were identified. A total of 27 (20.3%) revisions for any reason were identified. 17 revisions were done for infection, 2 periprosthetic fractures above or around an anchor plug were identified, 1 revision for progression of oncologic disease, and 1 removal for a dis-vascular leg. 4/6 (66.7%) of aseptic mechanical failures occurred within 1 year, 5/6 (83.3%) within 2 years and 1 late failure at 50 months post op were identified. Risk of aseptic mechanical failures based on anatomic location, 2 proximal tibia RR (4.85 (95% CI; 0.980-24.0) p = 0.053, 4 distal femur RR (1.66 (95% CI; 0.31-8.76) p = 0.55, no aseptic mechanical failures were noted in the proximal femur. All aseptic mechanical failures were noted in the revision of failed arthroplasty group RR (4.64 (95% CI; 0.270-80.0) p = 0.290. We identified no other patient or implant factors associated with failure.

Conclusions: Our results demonstrate a higher than previously reported survivorship for proximal femoral, distal femur and proximal tibia reconstruction using the Compress[®] device. We identified an increased risk of aseptic

mechanical failure for proximal tibial replacement. This study supports an increased risk of early aseptic mechanical failure of the Compress® with improved survivorship after 1 year post operation. Revision arthroplasty as an indication for surgery showed a trend toward increased risk of aseptic mechanical failure but this did not reach significance. No patient or implant factors were associated with failure.