EndoProsthetic Replacement for non-Oncological conditions (EPRO) study: a UK multicentre cohort study on the clinical outcomes of distal femoral replacement for non-oncological conditions

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INTRODUCTION:

Distal femoral replacements (DFRs) are useful in the management of oncological reconstructions. It has also been demonstrated to play a role in the management of non-oncological indications such as fractures with bone loss, revision arthroplasty, and prosthetic joint infections (PJIs). However, previous studies are limited to single centre experience. The purpose of this multicentre cohort study was to determine clinical outcomes following DFRs for non-oncological indications and identify risk factors for developing local complications.

METHODS:

All patients undergoing consecutive DFR surgery from October 2009 across five UK arthroplasty centres were identified using pre-existing local databases with a minimum follow up of 2 years. Patients were excluded if they had surgery for oncological indications. Local institutional board approval from each department was obtained and anonymised data on patient, treatment and implant-related factors were obtained.

The primary outcome measure was local complication rate. Secondary outcome measures were return to baseline mobility, return to baseline residence, six-month systemic complications rate, two-year reoperation rate, 30-day and one-year mortality rates.

A total of 229 DFRs were included with a median age of 78.1(IQR, 70.3-84.0) years. There were 154(67.2%) females and the median Charleston comorbidity index (CCI) was 4(IQR, 3-5). Indications for surgery were periprosthetic fracture (PPF) in 74(32.3%), aseptic revision arthroplasty 46(20.1%), acute trauma 42(18.3%), infected revision arthroplasty 41(17.9%), chronic/failed trauma 14(6.1%) and complex primary revision arthroplasty 12(5.2%). The median surgical time was 135(IQR, 108-174) mins. The median femoral construct to femoral stem ratio (CSR) was 0.59(IQR,0.49-0.80) and the median tibial stem length was 120(IQR, 95-140) cm. Patients were followed-up for a mean of 4.5± 3.3 years.

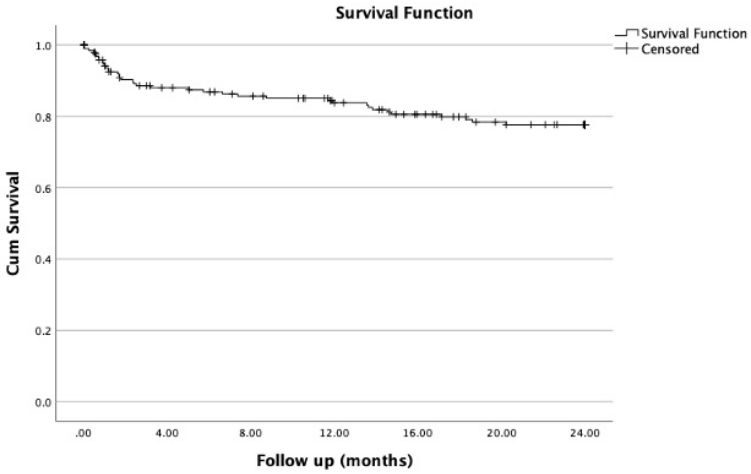
RESULTS:

The local complication rate was 21.0%(48) with PJIs 9.6%(22) and PPF 3.1%(7) being the commonest. A return to baseline mobility and residence was observed in 51.0%(94) and 82.7%(182) respectively. The six-month systemic complication rate was 12.2% and the two-year reoperation rate was 12.7%. The 30-day mortality rate was 2.6% and the one-year mortality rate was 9.2%

Survivorship analysis demonstrated that 79.9% implants survived to 2 years without developing a local complication (Figure 1). Binary logistic regression demonstrated statistically significant results between increasing femoral CSR [OR 1.407, 95%CI: 1.548-10.774, p=0.004], prolonged operative time [OR 0.009, 95%CI 1.001-1.0017, p=0.034], indications (those undergoing surgery for infected revision arthroplasty [OR 1.627, 95%CI 1.173-22.074, p=0.030] and complex revision arthroplasty [OR 2.074, 95%CI 1.114- 56.877, p=0.039] in comparison to acute trauma) and a higher local complication rate following DFR. There was no association between local complications and age, gender, CCI or tibial stem length.

DISCUSSION AND CONCLUSION:

This is the largest study looking at DFRs for non-oncological indications and demonstrates good implant survivorship in the short and medium term. Risk factors for developing local complications include prolonged operative time, increasing CSR, those undergoing surgery for infective revision and complex revision arthroplasty. Obtaining long term follow up data and patient reported outcome measures could have had additional benefit to this study. DFRs for non-oncological indications remain a suitable salvage option with at risk patients being adequately counselled perioperatively.


Survival Function
Survival Function
Censored
Cum Survival
1.0
0.8
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0.4
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8.00
12.00
16.00
20.00
24.00
Follow up (months)