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

Maheshi Wijesekera, Jamie East, Corey David Chan¹, James Neville Hadfield, Mohammed As-Sultany, Eslam Abourisha, Liam Yapp², Catherine James, Chryssa Neo, Al-Amin Kassam, Timothy Gordon Petheram, Henry Wynn Jones³, Nicholas Eastley, Chloe Scott, Hemant G Pandit, Jeya Palan, Sameer Jain⁴

¹Northumbria Healthcare NHS foundation trust, ²NHS Lothian, ³Wrightington Hospital, ⁴Leeds Teaching Hospitals NHS Trust

INTRODUCTION:

Proximal femoral replacements (PFRs) are well-established for the use in oncological reconstructions. In addition, they also serve a role in aseptic loosening, prosthetic joint infection (PJI), complex fracture patterns, and failed trauma surgery. Previous studies have all been limited by their single-centre experience and relatively small sample sizes. Therefore, the purpose of this multicentre cohort study was to determine clinical outcomes following PFRs for non-oncological indications and identify risk factors for developing local complications.

METHODS:

All patients undergoing PFR surgery from August 2004 across six UK centres with a minimum of 2 -year follow up were identified using pre-existing local databases. Patients were excluded if they had surgery for oncological indications. Local institutional approval from each department was obtained and anonymised data on patient, treatment and implant-related factors were obtained.

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

A total of 230 PFRs were included with a median age was 76.0(IQR, 66.9-83.7) years. There were 131(58.0%) females and 146(63.5%) had an ASA (American association of anaesthesiologists) grade of 3 or 4. Indications for PFR were periprosthetic fracture in 62(27.0%), infective revision arthroplasty in 55(23.9%), chronic/failed trauma in 41(17.8%), aseptic revision arthroplasty in 38(16.5%), acute trauma in 33(14.3%) and complex primary arthroplasty 1(0.4%). Median surgical time was 182(IQR,136-216) minutes. PFRs were performed as a total hip replacement in 206(89.6%) and as a hemiarthroplasty in 24(10.4%). Acetabular components were either dual-mobility or constrained in 133(57.8%) patients. The median construct length was 150.0(IQR,100.0-192.3) cm, and median stem length was 127.0(IQR,127.0-150.0) cm. Patients were followed-up for a median of 4.28 (IQR, 1.9-7.2) years. RESULTS:

The local complication rate was 27.0%(62) with dislocation 11.7%(27) and PJI 9.6%(22) being the commonest. A return to baseline mobility and residence was observed in 55.2%(127) and 87.0%(200) respectively. The six-month systemic complication rate was 9.1% and the two-year reoperation rate was 17.0%. The 30-day mortality rate was 1.7% and the one-year mortality rate was 8.3%.

Survivorship analysis demonstrated that 78.7% implants survived to 2 years without developing a local complication (Figure 1). Binary logistic regression analysis demonstrated that an increasing operative time was associated with a statistically significant higher local complication rate following PFR [OR:0.993, 95%CI:0.987-0.999, p=0.048]. There were no association between local complications and age, gender, ASA grade, indications for surgery, implant type, acetabular component or construct length <150 vs \geq 150cm.

DISCUSSION AND CONCLUSION:

This is the largest study that looks at PFRs for non-oncological conditions and demonstrates good implant survivorship in the short and medium term. Prolonged operative time was the only risk factor associated with an increased local complication rate. Limitation of this study is that long term follow up data and patient reported outcome measures were not obtained in this cohort. In summary this multicentre study demonstrates that PFRs for non-oncological indications remain a suitable salvage option with complication rates lower than previously described.

