INTRODUCTION

The failed primary total hip arthroplasty is often complicated by proximal femoral bone deficiency at the time of revision. Novel modular femoral stems allow maximal implant-bone contact in the diaphysis with concurrent metaphyseal support. Through independently obtaining stem fixation, one can address the offset, hip stability and leg length discrepancies separately and further enable intraoperative versatility.1,2

We aimed to evaluate early outcomes in patients with significant proximal femoral bone loss who were revised with a novel distally fixed modular stem to determine if the system established hip stability and was feasible for revision hip surgery.

METHODS

Thirty-one distally fitted modular stems implanted for Paprosky type 3B or 4 femoral defects were clinically and radiographically reviewed. There were 15 men and 16 women with a mean age of 67 years. Preoperative radiographs determined the optimal sizes for the stem, sleeve and neck for the REDAPT revision femoral prosthesis. The postero-lateral approach was used in all cases with instruments designed to separately ream metaphyseal and diaphyseal portions. Postoperative radiographs were reviewed for migration, osteolysis, alignment, atrophy and fracture. Harris Hip scores (HHS) were compared pre and postoperatively. The mean time to follow-up was 28 months (range 8–36).

PAPROSKY TYPE IIIB & IV DEFECTS

Type IIIb: Metaphysis is severely damaged and non-supportive, with < 4 cm of diaphyseal bone available for distal fixation. The horizontal lines on the radiograph demarcate the amount of femoral isthmus available for distal fixation.4

Type IV: Extensive metaphyseal and diaphyseal damage in conjunction with a widened femoral canal. The isthmus is non-supportive.5

RESULTS

Radiographically, all 31 hips were stable with definite signs of osseointegration at last follow-up. No femoral component underwent revision.

There was one intra-operative greater trochanter fracture. Two hips dislocated, one of which required acetabular revision; the other had no further incident. Two patients reported anterior thigh pain, radiographically these implants were stable, and both experienced a significant improvement in function and range of movement. No prosthetic breakage, uncoupling or infection occurred.

Twenty-five (81%) patients mobilised independently or with one support at last follow-up, 6 (19%) ambulated with two sticks or a walker. The mean HHS improved from 38 (range 16–55) to 70 (range 51–84), with a mean 14° improvement in flexion (range 4–18), 28 (90%) patients experienced a functional improvement.

Indications for Revision:

DISCUSSION

Extensive femoral bone loss provides a great challenge in revision surgery. Achieving stable distal fixation is difficult. Novel implants that combine modular stable fixation with proximal support have proven to be advantageous in this regard. The REDAPT stem allows for maximal diaphyseal fixation with concurrent metaphyseal support, while permitting independent restoration of offset and version thus restoring hip kinematics.

In this series of 31 patients we have seen no stem migration, very good stability and short term function. Our favourable results with the REDAPT Revision femoral stem for extensive cortical deficiency extending into the isthmus improves upon historical data of failure rates as high as 15% for revisions with distal femoral cortical loss.3,4

Limitations:

Retrospective case series

Absence of a control group

Limited number of cases and relatively short follow up

REFERENCES