INTRODUCTION

Revision of total hip replacement is undertaken as part of the onward need after primary hip replacement surgery. Pain constitutes the single most important reason for revision hip surgeries. Other important causes include deep infection, multiple atraumatic hip dislocations and aseptic loosening seen on radiographs as radiolucency along different gruen zones around femoral stem.1 Primary hip replacement could be difficult to remove if it is done with cementing technique. Different techniques exist for removal of the implant and bone cement. At present, surgeons make use of controlled osteotomy, drilling technique, using reamer, osteotome and scissor instrument for achieving this lengthy task, which makes these patients at risk for extra bleeding and inadvertent eccentric reaming, calcar fracture and at times perforation of the femoral stem.2 If these complications are recognized per-operatively, efforts should be made to correct them by use of circlage wire for calcar fracture and controlled stem insertion in cases of cortical perforation.

We document an extraordinary performance of collar bearing femoral-cemented stem after 14 years of revision total hip replacement without any functional problem after the stem tip was identified to have perforated from the femoral canal immediately after surgery in postoperative X-ray.

CASE REPORT

A 79 years old female with no co-morbidities except controlled mild hypertension, who had earlier primary left total hip replacement 29 years ago at the age of 50 years. She reported multiple dislocations of the same hip and her X-rays revealed osteolysis around the stem prosthesis (Figure 1). She subsequently had cemented revision of her entire total hip 14 years ago (Figure 2). She had her acetabulum revised with mesh and shell alongwith the use of bone allograft. She was identified to have anterior cortical perforation of the femoral stem near prosthesis tip in her X-ray done postoperatively. She was mobilized protected weight bearing for 3 months. She recovered uneventfully and started complete weight bearing after 3 months. Postoperatively, she did not have any significant complication. At her annual clinic follow-up visit, she was very pleased and walking without any support on her left leg. There was no pain as measured on visual analogue scale (VAS). She has SLR of 80 degree on the left side and about 2.5 cm shortening of her left leg for which she has a shoe raise. She has no trendelenburg gait and her hip abductors are working normally with 5/5 power on MRC scale. She has good range of movement of her left hip and complete satisfaction after her revision total hip surgery for all throughout 14 years period.

DISCUSSION

Femoral stem perforation is a well-recognized per-operative complication of femoral canal reaming with inadvertent eccentric reaming often predisposing the bone to perforation and subsequently to fracture.2 This complication is well recognized in both cemented and cement-less revision total hip replacement. Surgical approach does not affect the complication rate. Stem
length, stem diameter and host bone quality usually affects this complication rate. Studies have also proven loss of bone mineral density (BMD) on dual-energy X-ray absorptiometry (DEXA) in peri-prosthetic area of femoral implant after primary total hip replacement. The magnitude of this loss is highest in gruen zone 7 (mean 15.2% per year) compared to other zones. This loss of BMD is seen more often after cemented than after non-cemented insertion of femoral stem. This factor also leaves femur at high risk of perforation, either during cement removal for preparing femur for revision stem insertion or during reaming process. Cortical thickness has its role in preventing sudden perforation, specially while using cement removal devices like oscar instrument and a minimum of 1 mm cortical thickness as shown in a study to effectively prevent such complication when observed in strict sense. Recently, Roberts et al. have discovered short height patients and those with excessive bowing of femur are at increase risk of anterior impingement and cortical perforation while insertion of Intra-medullary nail for proximal femur fractures. The above risk may also apply for patients coming for hip replacement and revision cases where an extra vigilance might be required while reaming the femoral canal.

Studies in the past have shown good short to mid term outcome evaluation in patients who develop intra-operative fracture or perforation of femur after revision total hip replacement. The study published by Meek et al. has shown no significant effect on the functional outcome or radiologic evidence of bone in growth with minimum follow-up of 2 years. In another study, the authors have made use of S-ROM modular THR for revision and primary hip surgeries. They identified single case of anterior femoral canal perforation by prosthesis tip after insertion of long straight stem using un-cemented technique. This case was followed-up for three and an half year and showed good mid-term results in outcome assessment.

This is the first reported case of the long-term close annual follow-up of exteriorized femoral stem after cortical perforation of femur near the stem tip. Our patient has extraordinary outcome assessment, both clinically and radiologically, after a regular annual follow-up of 14 years post-surgery. This patient is mobilizing without the use of any walking aid. We recommend the use of controlled stem insertion if any suspicion arises on the operative table about this complication. Further, these patients require regular annual follow-up to check for their clinical and radiological status should an expectant course is followed.

REFERENCES