CASE REPORT

Successful revision of polyethylene only, after delayed presentation of a dislocated bearing in an Oxford unicompartmental knee replacement

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SUMMARY

We present the case of a 79-year-old man who dislocated the mobile bearing of a well-functioning Oxford unicompartmental knee replacement in a fall. The diagnosis was delayed by 14 days during which time the patient remained fully mobile. At the time of arthrotomy, there was some visible burnishing of the femoral articular surface where it had been rubbing on the tibial component. Both components were soundly fixed and had been functioning well for 7 years. The decision was made to leave the components in situ and simply replace the mobile meniscal bearing. The patient returned to full normal activity and has been followed-up for 3.5 years. Serial X-rays reveal no evidence of polyethylene wear and the knee remains pain free and fully functional. We conclude that it is safe to retain the components of an Oxford unicompartmental knee replacement despite some evidence of surface damage. Replacing just the mobile meniscus gave a good result in our patient.

BACKGROUND

Dislocation of the mobile meniscus is a well-known complication of mobile bearing unicompartmental knee replacement prostheses. If recognised early, the decision to replace the meniscus is straightforward. If recognised late, there may be some damage to the metal articular surfaces and the dilemma is whether to revise the entire device or simply replace the bearing.

CASE PRESENTATION

Introduction

The theory of mobile bearing arthroplasty devices is to improve the distribution of stress and thereby reduce polyethylene wear rates. One disadvantage of these devices, however, is the inherent instability of the mobile meniscus and the risk of dislocation. Revision surgery to exchange the mobile meniscal bearing is relatively straightforward and while it still requires a formal arthrotomy, it is quick and does not necessitate any components being revised. If, however, there is damage to the metallic articular surfaces, most surgeons would suggest that the arthroplasty should be formally revised either to a fresh unicompartmental or a total knee replacement. This is a far larger procedure with the risk of bone loss as the components are removed and is much more technically demanding. The difficulty for the surgeon is how to predict preoperatively whether the arthroplasty can be salvaged by bearing exchange or needs full revision. Also at the time of arthrotomy it can be difficult to decide how much damage to accept before the decision to revise is made (figures 1 and 2).

Case report

A fit and healthy 79-year-old man presented to our unit in June 2009 reporting inability to fully extend his knee, some anterior discomfort and the feeling that 'something had changed' within his knee. He had undergone an Oxford unicompartmental knee replacement in 2001 and had been happy with it for over 7 years. He reported that 14 days earlier he had been descending some steps, stumbled and forced his knee momentarily into a valgus and flexed position. He had subsequently regained full mobility but had a number of symptoms which had not been present before his fall.

Examination revealed a small effusion, 5° of fixed flexion, a tender fullness anteromedially and a correctible varus deformity. X-ray showed that the mobile meniscal bearing was dislocated anteromedially. The patient was given crutches, urged to be non-weight bearing and was prepared for theatre on the next specialist knee list. The previous arthrotomy was reopened and the meniscal bearing retrieved. It was found to be in good condition with no macroscopic evidence of wear or scratching. The metal articular components were then checked in detail and were found to be soundly fixed and well aligned. There was a patch of burnished surface on the femoral component that was visible but not palpable to the gloved finger. This was in the midline of the device and formed the contact zone with the tibia between 10° and 30° of flexion. The tibial component showed no obvious

Figure 1 Knee X-ray of the dislocated mobile bearing.

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Figure 2 Post replacement check X-ray after 3.5 years.

surface damage. The anterior cruciate ligament and remaining articular surfaces were in good condition. After some debate, it was decided to simply exchange the polyethylene bearing surface and retain the other components. The patient was encouraged to mobilise fully weight-bearing immediately. The patient has been followed up at 6-month intervals for the last 3.5 years. He reports full normal function and has no pain. Examination reveals an intact straight leg raise with no lag and flexion to 115°. Serial X-rays show no evidence of polyethylene wear.

OUTCOME AND FOLLOW-UP

Our patient has been followed up for 3.5 years with no functional limitation and no evidence of excessive polyethylene wear. This case indicates that it is reasonable to retain the metal components and simply exchange the mobile bearing despite a mild degree of damage to the metal component surfaces.

DISCUSSION

Mobile bearing knee replacement prostheses were first introduced in 1978 by Goodfellow. The aim of these devices is to reduce polyethylene wear and to improve the congruity between the articulating surfaces.[1] Some studies have reported a reduced polyethylene wear rate with mobile bearing design wear rates.[2 3] Other authors report no significant difference in the clinical outcome or long-term survival between fixed and mobile bearing devices.[4 5] One ongoing issue with mobile bearing devices is their tendency for the mobile meniscus to dislocate. Dislocation rates as high as 9.3% have been reported in some series.[6] Increased rates of dislocation are associated with varus positioning of the tibial component[7] and are more frequent in the first year postoperatively.[8] The dislocated mobile bearing can be reduced both by open and closed techniques.[9] The closed technique can be used to relocate the bearing in cases which are uncomplicated and are diagnosed promptly. Open reduction is suggested for patients who present late or with associated neurovascular compromise. Late presentation can result in damage to the exposed metal components of the prosthesis with loss of surface congruity or loosening of the prosthesis. There is also the concern that damaged articular surfaces could have increased surface roughness and would result in high rates of polyethylene wear if they were retained and a new meniscus inserted. In the case presented, diagnosis was delayed by 2 weeks resulting in the formation of an area of eburnation on the femoral articular surface. There was no loosening of the components, however, and the prosthesis had been well functioning prior to the dislocation. It was therefore decided to exchange the polyethylene meniscus only and retain the metal components.

Learning points

- A dislocated mobile bearing even if presented late can be treated with exchange of only the polyethylene.
- The threshold for knee replacement revision surgery should be kept high in such cases.
- A dislocated mobile bearing needs to be diagnosed and treated promptly.

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