Recurrent hemarthrosis caused by loosening of the femoral component after unicompartmental knee arthroplasty: a case report

Abstract

A case of recurrent hemarthrosis of the knee after a mobile-bearing unicompartmental knee arthroplasty (UKA; Oxford UKA) is described. A 58-year-old man met with a road traffic accident 10 months after UKA. He developed anteromedial pain and hemarthrosis of the knee joint 1 month after the accident, which required multiple aspirations. Physical examination showed no instability. Plain radiograph revealed no signs of loosening. All laboratory data, including bleeding and coagulation times, were within normal limits. Diagnostic arthroscopy demonstrated loosening of the femoral component. Any intra-articular pathology other than nonspecific synovitis was ruled out. The loose femoral component and polyethylene meniscal bearing were revised. Since then, hemarthrosis has not recurred.
Recurrent hemarthrosis after knee arthroplasty is a rare complication. The occurrence is presumed to be less than 1% in total knee arthroplasty (TKA)\textsuperscript{1-9}, and it is merely reported after UKA\textsuperscript{10-11}. The reported causes of hemarthrosis after TKA are impingement of the fat pad or hypertrophic vascular mass of the synovium, femoral flare eroding through an atherosclerotic superior lateral genicular artery, and pigmented villonodular synovitis \textsuperscript{1-9}. The reported lesions in nonprosthetic knees are anterior cruciate ligament tears, major meniscus tears, osteochondral fractures, posterior cruciate ligament tears, and coagulation disorder \textsuperscript{12-17}.

We report a case of recurrent hemarthrosis after UKA caused by loosening of the femoral component.

Case report

A 58-year-old man met with a road traffic accident 10 months after a mobile-bearing unicompartmental knee arthroplasty (UKA, Oxford UKA; Biomet, Swindon, United Kingdom). His car was struck from the side at an intersection. He could walk on his legs; however, he complained a bruise on the anterior knee. The outcome of the arthroplasty was good with radiological evidence of well-fixed implants before the accident. However, he developed pain and hemarthrosis of the knee joint 1 month after the accident, which subsequently required multiple aspirations of blood (30–50 ml) at an interval of 3–12 days. The range of motion was normal (0/140°), but the patient complained of anteromedial knee pain. Physical examination showed no instability. Plain radiograph revealed no signs of loosening such as radiolucent lines or osteolysis (Fig. 1). All laboratory data, including bleeding and coagulation times, were within normal limits. Diagnostic arthroscopy demonstrated loosening of the femoral component and a stable tibial metal tray by palpation with an arthroscopic probe. Any other intra-articular pathology, other than nonspecific mild synovitis, was ruled out. After completion of the arthroscopy, an anterior midline miniarthrotomy incision measuring approximately 5 cm was made through the previous scar. The loose femoral component and polyethylene meniscal bearing were revised. Since then, hemarthrosis has not recurred.

Discussion

To our knowledge, this is the first report of recurrent hemarthrosis caused by femoral component loosening after UKA. We thought that a direct blow on his operated knee caused a micro-crack of the cement between the component and the femoral bone surface, which extended to loosening. Micromotion of the component caused a continuous bleeding from the bone bed, which gave rise to recurrent hemarthrosis. Recurrent hemarthrosis after UKA, in itself, is a very rare complication \textsuperscript{10-11}. There are only two cases were reported in English literatures. Maheshwari reported a case of spontaneous hemarthrosis caused by the saphenous branch of the descending genicular artery with a prominent vascular blush, which was successfully treated by coil embolization \textsuperscript{10}. Raet reported a case of spontaneous hemarthrosis caused by traumatic rupture of the metal marker wire of an all-polyethylene inlay tibial implant, which caused destruction of the polyethylene surface and a disseminated synovitis \textsuperscript{11}.

The reported causes of hemarthrosis after TKA or in nonprosthetic knee are cruciate ligament tears, meniscus tears, osteochondral fractures, impingement of the fat pad or hypertrophic vascular mass of the synovium, and pigmented villonodular synovitis \textsuperscript{1-9,12-17}. Arthroscopic examination ruled out these intra-articular pathology in our case.

Loosening of the femoral component after UKA (Oxford UKA) is the second most common cause
of revision, and the incidence ranges from 0% to 2.1% \textsuperscript{18-21}. However, diagnosis of femoral component loosening is difficult \textsuperscript{25}. Symptoms related to component loosening are nonspecific and are usually reported as pain. Hence, it is very important to determine this early in the clinical course. There might be very subtle changes on standard anteroposterior or lateral radiographs before osteolysis occurs. Thus, comparison between early post-operative radiographs and present radiographs may show migration of the component. Moreover, it must be required to delineate the difference between pathological and physiological, non progressive, such radiolucencies which have been shown to be common and not related to loosening. Therefore, if femoral loosening is suspected, arthroscopic examination is preferred. Recently, as an alternative, Monk et al. described a technique using lateral extension and flexion radiographs \textsuperscript{22}, which might to be a powerful tool to obviate the need for arthroscopy.

Conclusions
In conclusion, our case showed that loosening of the femoral component might lead to recurrent hemarthrosis and suggested that arthroscopic exploration was thought to be one of useful methods to diagnose and, especially, to rule out other intra-articular pathology.

List of abbreviations
UKA: unicompartmental knee arthroplasty
TKA: total knee arthroplasty
Figures and legends

Figure 1 A, B
A: anteroposterior, B: lateral plain radiographs.

No formal signs of loosening such as radiolucent lines or osteolysis.
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