MENISCAL BEARING DISLOCATION IN THE OXFORD KNEE

by E. VERHAVEN, F. HANDELBERG, P. P. CASTELEYN and P. OPDECAM

The Oxford knee is a unicompartmental knee prosthesis with a polyethylene meniscal bearing. Anterior dislocation or medial subluxation has been described in lateral compartment arthroplasties. The authors present the case of a medial dislocation of the lateral meniscal bearing and a review of the literature concerning meniscal bearing instability in the Oxford Knee.

Keywords : Oxford Knee ; unicompartmental arthroplasty ; osteoarthritis ; knee.
Mots-clés : prothèse unicompartimentale ; Oxford ; genou ; gonarthrose.

SAMENVATTING

E. VERHAVEN, F. HANDELBERG, P. P. CASTELEYN en P. OPDECAM. Meniscale luxaties in de Oxford knieprothese.

De Oxford knie is een unikompartimentele knieprothese met een beweegbare polyethyleen meniscus. Anterieure luxaties of mediale subluxaties van deze meniscus zijn wel gekend bij arthroplastieken van het laterale kompartiment.
De auteurs beschrijven het geval van een mediale luxatie van een laterale polyethyleen meniscus en geven een litertuuroverzicht van de mogelijke oorzaken van meniscale instabiliteit in de Oxford knieprothese.

RÉSUMÉ

E. VERHAVEN, F. HANDELBERG, P. P. CASTELEYN et P. OPDECAM. Des luxations méniscales dans la prothèse d'Oxford.

La prothèse d'Oxford est une prothèse unicompartimentale du genou avec un ménisque en polyéthylène.
Des luxations antérieures ou des subluxations médiales de ce ménisque sont bien connues dans des arthroplasties du compartiment externe du genou. Les auteurs décrivent un cas de luxation médiale d'un ménisque externe et une revue de la littérature concernant l'instabilité méniscale dans la prothèse d'Oxford.

INTRODUCTION

Unicompartmental knee arthroplasty is a reliable treatment option for advanced unicompartmental osteoarthritis of the knee (1).
The Oxford knee is a resurfacing prosthesis with a high-density polyethylene meniscal bearing (fig. 1). The bearing articulates with a totally flat and unconstrained tibial component. On the femoral side, it presents a roller-in-through geometry. Bearings of different thicknesses are available, to obtain ligamentous balance (2, 3).
Bearing dislocation occurs mainly in lateral compartment arthroplasties (2).
In the literature, only anterior dislocation of the lateral bearing during knee flexion has been mentioned (2).
The authors report a case of medial dislocation of a lateral meniscal bearing. The dislocation could be reduced by arthroscopic manipulation.

CASE REPORT

A 56-year-old woman was admitted to our department with a painful left knee. While standing up from a sitting position she had suddenly experienced a sharp pain in the left knee, with a concomitant feeling of giving way. Two months before admission, a lateral Oxford unicompartmental knee prosthesis had been implanted for unilateral osteoarthritis.
Physical examination revealed a locked left knee in 30° of flexion, with an associated hemarthrosis. A plain radiograph of the knee demonstrated a medial dislocation of the lateral bearing into the intercondylar notch (fig. 2 a, b).

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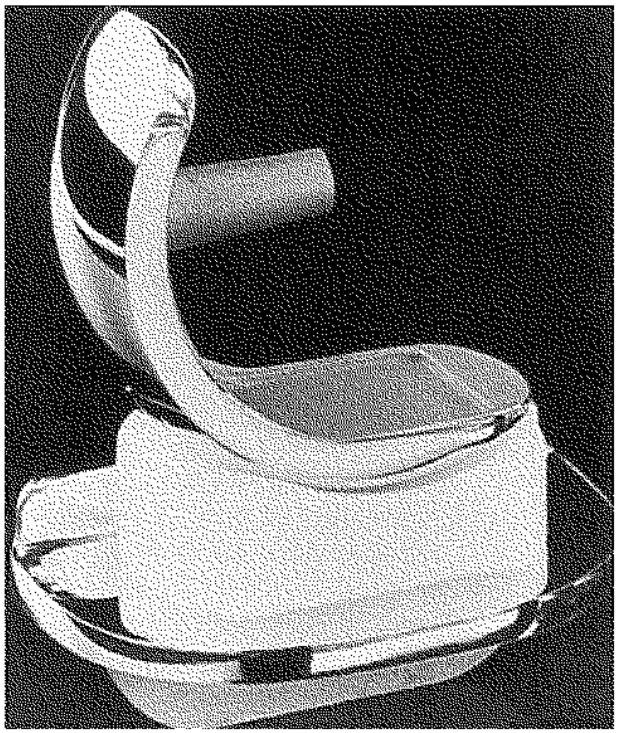


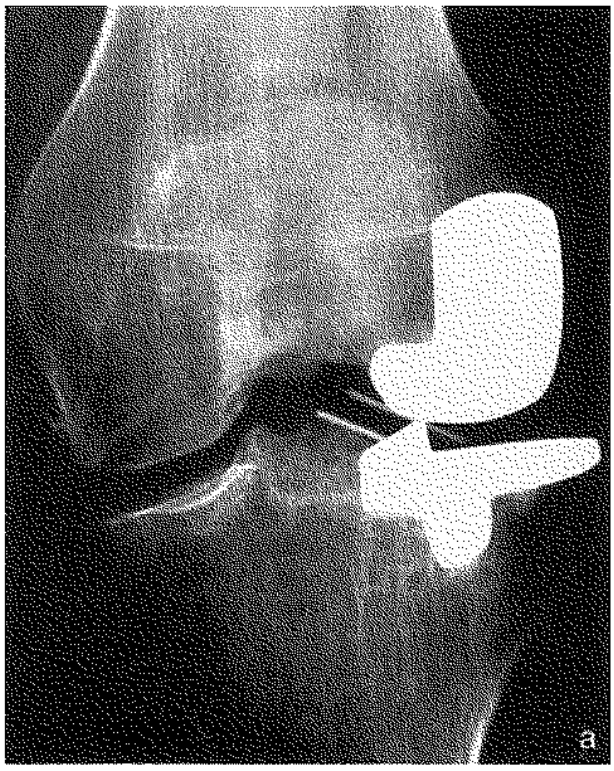
Fig. 1. — The Oxford unicompartmental knee prosthesis consisting of a metal tibial and femoral component, with a high-density polyethylene meniscal bearing.

Closed reduction under general anesthesia was attempted, but without success. Arthroscopic examination revealed the presence of some small intrasynovial tears of the anterior cruciate ligament, associated with cartilage lesions on the lateral side of the medial femoral condyle. During arthroscopy, by exertion of considerable varus stress with a leg-holder, the dislocated bearing could be reduced into its normal position with the hook palpator.

Clinical testing and radiographs showed the bearing to be stable in its reduced position, obviating the necessity to change the meniscal bearing size (fig. 3). Postoperatively, the knee was immobilized in extension with a plaster cast for 4 weeks. At the most recent followup visit, 10 months after reduction, the knee is stable, with recovery to a full range of motion.

DISCUSSION

The Oxford Knee is used for advanced unicompartmental osteoarthritis of the knee (2, 3). It consists of a high-density polyethylene meniscal bearing that is fully congruent over the complete



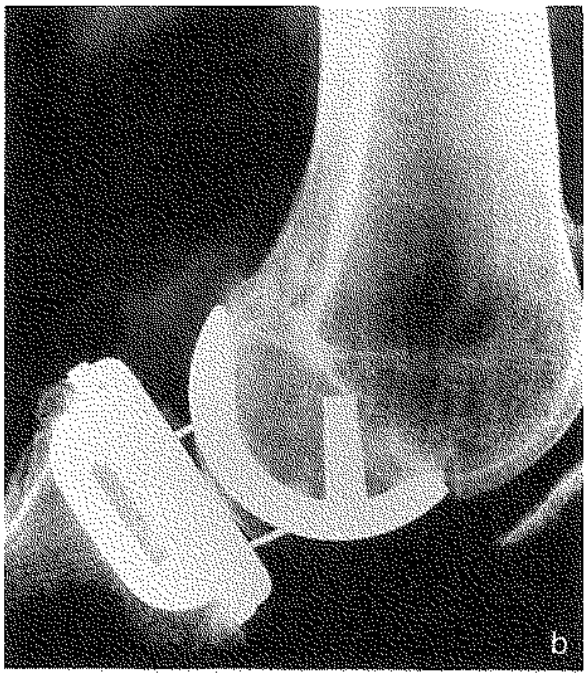


Fig. 2a-b. — AP and lateral radiographs showing a medial dislocation of the meniscal bearing in a lateral compartment arthroplasty.

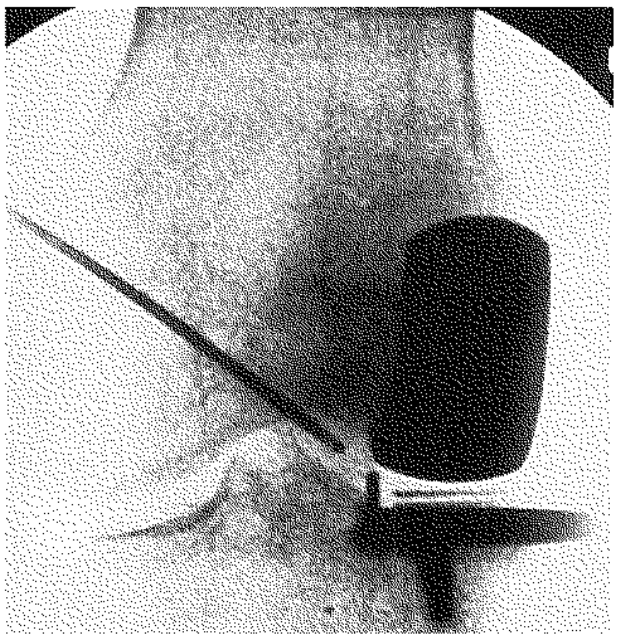


Fig. 3. — AP radiograph showing a reduced lateral meniscal bearing, after a successful arthroscopic manipulation with the hook palpator.

range of motion with both the metal femoral and the tibial components. The bearing is available in various sizes to provide the required stability of the knee (2, 3). Biomechanical studies of knee function during walking revealed that the performance of the Oxford knee approaches, but does not equal that of the natural knee (5).

Revision surgery is usually necessitated by dislocation of a meniscal bearing or by loosening of the tibial component (2, 3). Loosening of the tibial component is the main problem for medial compartment arthroplasties. The absence of the anterior cruciate ligament has been proposed as a causative factor (2). Biomechanical assessment of knee function after arthroplasty with the Oxford Knee, however, did not show any difference between knees with or without the anterior cruciate ligament (5).

Failures of the lateral compartment arthroplasties result mainly from bearing instability (2). Goodfellow found a 7.4% dislocation rate in lateral compartment arthroplasties, versus 1.3% in medial compartment replacements (2). Chronic bearing instability was present in 11.1% of the patients (2). This provides a bearing instability rate of 18.5% for lateral compartment arthroplasties (2).

Several causes might explain these failures. The greater laxity of the lateral capsule and the lateral ligamentous structures constitutes a greater risk for the lateral meniscal bearing (2, 3). This laxity also implies a tendency to underestimate the right thickness of the bearing with subsequent instability of the knee joint (2, 3). Generalized joint laxity and progressive neurologic disorders can proceed to joint instability with possible bearing subluxation or dislocation (2, 3). The type of approach is another predisposing factor for bearing dislocation. A medial parapatellar approach for lateral compartment arthroplasties easily leads to rotational malalignment of the tibial component. This tibial malalignment results in medial subluxation of the bearing during flexion or even in anterior dislocation in the fully flexed position (2). Therefore, Goodfellow advises a lateral parapatellar approach for lateral compartmental replacements (2).

With respect to our patient, Goodfellow states that the popliteal tendon is capable of causing a bearing dislocation. Several studies have emphasized the close relationship of the proximal insertion of the popliteal tendon and the lateral meniscus in a normal knee (4). This would justify prophylactic cutting of the tendon during arthroplasty (personal communication).

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