

# An Unusual Cause of Failure of a Total Knee Replacement

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There are many causes of failure of a total knee replacement (TKR), and the extensor mechanism is a common one.<sup>1-5</sup> This case report describes an unusual cause of failure—patella polyethylene wear caused by wear on the bony overgrowth in the notch of a posterior cruciate-retaining implant.

## CASE REPORT

A 69-year-old woman underwent an uncomplicated TKR of the left knee for end-stage osteoarthritis. A tricompartmental press-fit condylar cruciate-retaining cemented TKR with an all-polyethylene patella (DePuy, Warsaw, Ind) was used with standard technique. The entry hole for the femoral intramedullary rod was filled with a bone plug formed by the chamfer cuts of the femur and tapped flat.

The patient had an uncomplicated course and did extremely well. She had no complaints of pain and had obtained full extension and flexion to 125° by 3-month follow-up. Implant alignment was satisfactory (Figures 1-3).

Ten months after surgery, she presented to the office with a 2-week history of anterior knee pain when arising from a chair or going upstairs or downstairs. Level walking did not cause any problems. Examination findings were unchanged, as were the patient's x-rays. I initially felt she had tendonitis of the extensor mechanism, and I treated it with an anti-inflammatory medication and rest.

Over the next 6 months, symptoms worsened, and the patient began complaining of crepitus and noticed a significant amount of swelling. She complained of pain whenever she went upstairs or arose from a chair. Examination revealed a significant effusion and a synovitis. Arc of motion was from 0° to 125° with a solid endpoint. There was no instability. Crepitus was palpable when the patient bent her knee beyond 40°. I performed a thorough workup, including plain x-rays, laboratory tests, and 2 separate aspirations. Culture results were negative, x-rays unchanged, and laboratory results normal.

Fourteen months after the index surgery, with symptoms worsening, the patient was taken back to the operating room for exploration of the knee. During surgery, she was found to have a large effusion (normal cell count and cul-

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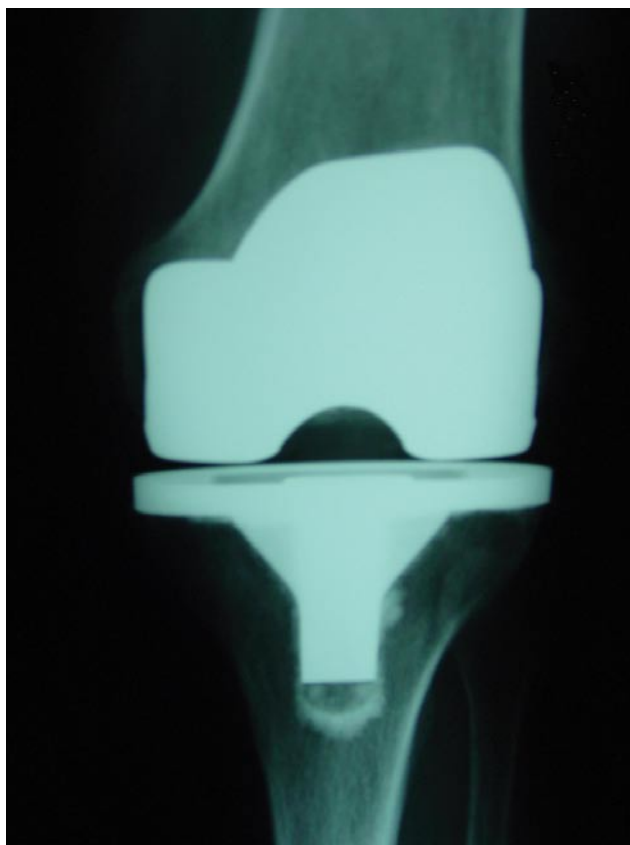
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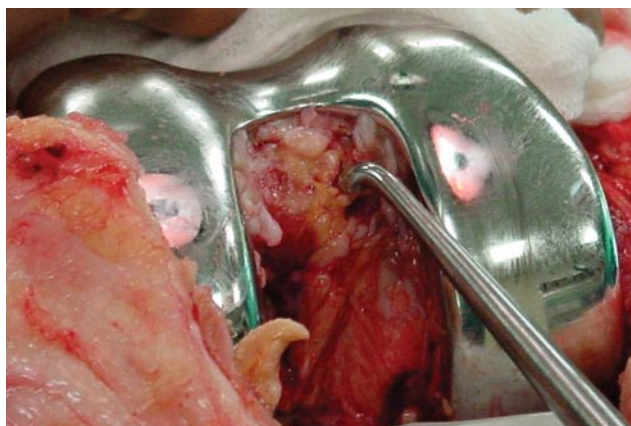
**Figure 1.** Sunrise view of a well-aligned total knee replacement implant with a well-tracking patella.



**Figure 2.** AP view of a well-aligned total knee replacement implant.



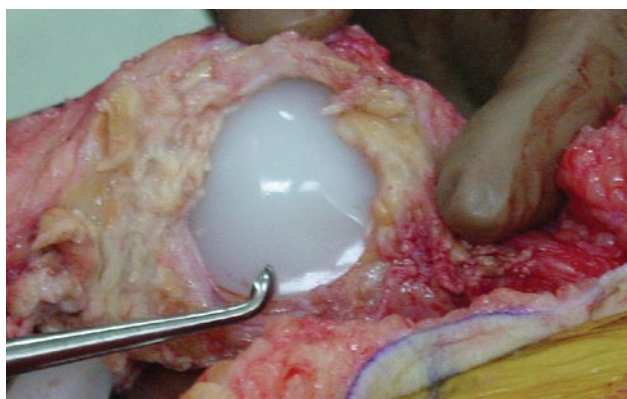
**Figure 3.** Lateral view of a well-aligned total knee replacement implant.



**Figure 4.** Patella polyethylene shows evidence of wear along the center—surprising for a 14-month-old implant.

ture, no crystals evident) and a reactive synovium. Femoral and tibial components were well fixed, and the tibial polyethylene showed basically no wear. The patella, which was well fixed and had a ring of soft tissue around the rim, showed evidence of polyethylene wear along the center of the polyethylene (Figure 4). With the capsule opened and the extensor mechanism in place, the knee was placed through an arc of motion, and crepitus was appreciated under the well-aligned and balanced patella. Inspection of the femoral notch revealed 2 large osteophytes, measuring at least 4 mm, that had formed where the bony plug had been placed and healed previously (Figure 5).

The osteophytes were removed, and the patella was revised without incident. At the 3-month, 1-year, and 6-



**Figure 5.** Osteophytes in the intercondylar notch surround the previously bone-grafted intramedullary entry hole.

year (final) follow-ups, the patient had no pain, swelling, or crepitus and an arc of motion of 0° to 125°.

## DISCUSSION

The extensor mechanism has been cited as the cause of up to 20% of TKR revisions.<sup>2</sup> Problems such as instability, fracture, malposition, osteonecrosis, tendinopathy, and rupture have all been reported. In this article, I describe a case in which osteophytes in the intercondylar notch of the femur caused patella polyethylene wear and pain. This situation was not evident on x-ray but was consistent with preoperative examination findings. During revision, osteophytes are commonly found around the femur, tibia, and patella. In my patient's case, their being located in the intercondylar notch of the femur led to patella polyethylene wear and, eventually, the need for revision.

In cruciate-retaining knees, the femoral notch is not covered by metal, and, if an intramedullary guide is used, how the hole is plugged (a good way to decrease blood loss) can cause impingement. Traditionally, the hole is filled with autogenous bone graft, usually from the chamfer cuts on the femur. However, the bone plugs can either back out of the hole or, as in my patient's case, be associated with impinging bone osteophytes.

This case led to a change in the technique I use. Now, instead of bone-grafting intramedullary entry holes, I fill them with cement while the femur is being cemented. Cementing the holes is quick, predictable, and effective and has been done without any problems in more than 2000 TKRs. The cement also serves as a landmark in the case of revision.

## AUTHOR'S DISCLOSURE STATEMENT

The author reports no actual or potential conflict of interest in relation to this article.

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