

# Traumatic late dissociation of the polyethylene articulating surface in a total knee arthroplasty—a case report

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Submitted 99-12-28. Accepted 00-05-21

A 70-year-old man suffering from gonarthrosis was treated with bilateral proximal tibial osteotomies in 1990–91. Because of persistent pain in his left knee, a Kinemax total knee arthroplasty (TKA) (Howmedica, Rutherford, NJ, USA) was performed in early 1993. A 12-mm thin tibial insert was not sufficient to achieve varus-valgus stability at this operation, and 6 months later, he was reoperated on and the polyethylene articulating surface was changed to an 18 mm thick component. Postoperative radiographs showed no malalignment of the components (Figure 1A) and the patient was satisfied at follow-up 2, 9 and 15 months after surgery, had no pain or swelling, only a slight remaining varus-valgus instability and 0°–135° range of motion.

4.5 years after surgery the patient fell directly on his knee on an icy road. He felt immediate pain and noticed slight knee swelling. At a radiographic examination 3 months later, no notice was taken of a suspected dissociation of the polyethylene articulating surface from its tibial metal backing—probably because the radiologists at the hospital

were used to a different TKA system with markers in the plastic insert (Figure 1B).

1 year later, the patient attended the emergency department because of sudden onset of severe knee pain and a total loss of motion in the joint. The radiographs then revealed complete dissociation of the polyethylene component (Figure 1C). Stability could not be achieved at revision surgery because of a degenerative rupture and total erosion of the patellar tendon. An arthrodesis was therefore performed. Both the plastic insert and the tibial component showed obvious signs of long-term wear (Figure 2).

## Discussion

Although dissociation of the polyethylene tray from the metal tibial plateau is a known complication after TKA (Davis et al. 1991), it can easily be overlooked at an early stage. Our patient had an extreme flexion capacity which may lift the anterior rim, by producing stress on the posterior part

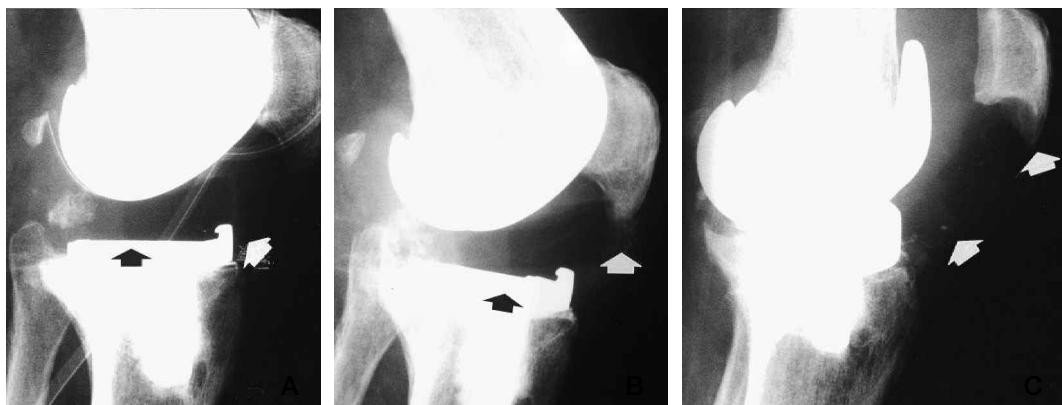


Figure 1. Radiographs postoperatively (A), 3 months after trauma (B) and finally, complete dissociation prior to revision with arthrodesis (C). Arrows define the plastic insert.

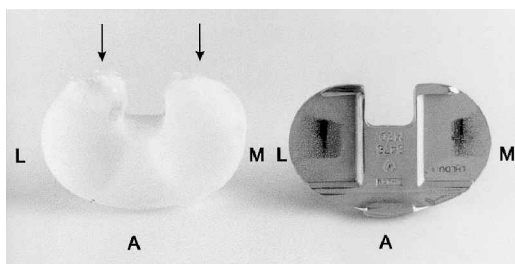


Figure 2. Wear pattern of the polyethylene insert and the tibial metal backing. A anterior, L lateral, M medial. Arrows indicate areas of maximum wear.

of the polyethylene insert and promoting a sliding force forwards of the tibia (Shimagaki et al. 1990, Davis et al. 1991). This interpretation of the mechanism is supported by the wear pattern on the tibial components, presented in Figure 2.

Certain locking mechanisms may also be more vulnerable to dissociation. The 2 cases reported by

Davis et al. (1991) had been performed with PCA<sup>®</sup> tricompartmental knees (Howmedica, Rutherford, NJ, USA), uses a mechanism similar to the Kinemax knee. Both TKAs are very common in Sweden (The Swedish Knee Arthroplasty Register 1999). This causes concern, since a lack of markers in the polyethylene articulating surface obviously creates diagnostic difficulties.

Davis P F, Bocell jr J R, Tullos H S. Dissociation of the tibial component in total knee replacements. *Clin Orthop* 1991; 272: 199-204.

Robertsson O, Knutson K, Lewold S, Lidgren L. Arthroplasty for osteoarthritis and rheumatoid arthritis 1986-1995: Outcome following validation of Swedish National Register, Poster session, AAOS, Anaheim, CA, USA 1999.

Shimagaki H, Bechtold J E, Sherman R E, Gustilo R B. Stability of initial fixation of the tibial component in cementless total knee arthroplasty, *J Orthop Res* 1990; 8: 64-71.