Revision of the Polyethylene Component for Wear in Bone-Ingrowth Total Knee Arthroplasty

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PURPOSE
Revision of the polyethylene spacer for wear and instability in TKA without removing osteointegrated components can minimize surgical trauma and preserve bone. The purpose of this study was to evaluate a series of knees with well-attached, bone-ingrown metal components that had revision of only the polyethylene component.

METHODS
Forty-nine knees (29 Ortholoc I, eight Ortholoc II, five Advantim, five AMK, two MG II) failed due to wear, but maintained bone- ingrowth fixation of the femoral and tibial components. All had polyethylene component revision, curettage, and bone grafting of osteolytic cysts.

The Ortholoc I polyethylene component was not modular, and the AMK and MG II have inadequate locking mechanisms for the polyethylene components, so a locking mechanism was fabricated using a carbide bit to cut locking grooves and polymethylmethacrylate to secure fixation of the polyethylene to metal. The Ortholoc II and Advantim have competent locking mechanisms and allowed polyethylene component exchange without PMMA for fixation.

RESULTS
Three failures occurred. A gamma-irradiated polyethylene component was inserted in an Ortholoc II tibial component, and failed 23 months later from wear. It was revised to an ethylene-oxide sterilized component, and has functioned well with no signs of wear for 77 months.

One Ortholoc II knee had polyethylene component revision with an unconstrained component, avulsed the posterior cruciate ligament, and dislocated the tibia posteriorly. The femur fractured during reduction, and the knee was salvaged with a new femoral component and a conforming tibial polyethylene component.

One Ortholoc II knee with massive tibial osteolysis sustained fracture of the tibial metaphysical bone stock 2 months after revision, but healed in situ with 5° varus deformity.

No knee with a fabricated locking mechanism has failed, and the remaining knees function well without evidence of wear or instability.

CONCLUSIONS
Knees with failure of the polyethylene component due to wear can be salvaged successfully when the new polyethylene component is made of modern wear-resistant material.

A locking mechanism fabricated with a carbide bit and secured with polymethylmethacrylate can be effective in tibial polyethylene components with an inadequate locking mechanism.