12-Year Results of Cementless Total Knee Arthroplasty

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This study evaluated the clinical results of a total knee system that was designed to achieve osteointegration of all components. The results of two groups—a heavy, active patient group and an older, less heavy patient group—were compared with one another and the entire series of patients.

Study Design
A series of 1,562 knees done consecutively from October 1993–October 2000 were reviewed prospectively. The Profix (Smith & Nephew, Inc.) total knee replacement was implanted in all knees. A group of 125 active, heavy patients (<56 years of age, >90 kg) (167 knees) with osteoarthritis was segregated to compare the results with those of older, less heavy patients. Mean age was 48±6 years (mean ± standard deviation). Mean weight was 109 ± 12 kg. Ninety-nine patients (126 knees) were men and 26 patients (41 knees) were women. The older, less heavy group of 122 patients (167 knees) with osteoarthritis were >65 years of age and <80 kg. Eighty-nine patients (126 knees) were men and 33 patients (41 knees) were women. The mean age was 72 ± 11 years (mean ± standard deviation). The mean weight was 74 ± 6 kg (mean ± standard deviation). The results of these two groups were compared with those of the combined group.

Implant Design—Femoral
The Profix femoral component was designed to have inherent stability without the use of cement, a patella-friendly femoral component (no patellar resurfacing), and porous coating on weight-bearing surfaces. No porous-coating was applied on the anterior flange in the earliest design, but later full porous-coating was applied to the femoral component.

Implant Design—Tibial
The tibial component was designed with a porous-coated undersurface, pegs, screws for fixation, a grit-blasted stem, and a robust polyethylene locking mechanism.

Surgical Procedure
The instrumentation included precision cutting guides to provide surface cooling during cutting.
Results

Three knees had early femoral loosening because of an instrument defect. No tibial loosening occurred. Although tibial radiolucencies were common peripherally, none widened. No osteolytic defects occurred around the screws. Radiolucency did not occur around the stem.

Survivorship at 10 years postoperative was 100% both in the young, heavy group and the older, less heavy group. The combined group had survivorship of 97.8% at 10 years. Anterior radiolucency occurred in 23% of the patients implanted with a non-porous coated anterior flange. Radiolucency occurred along the anterior flange in 4% of the patients implanted with a fully porous-coated femoral component.

Conclusions

Implant design and surgical technique are important factors in results of osteointegration. With the Profix total knee replacement design, osteointegration technique is equally as effective for young, active patients as for older patients.