Does Preoperative Patellofemoral Joint State Affect Medial Unicompartmental Arthroplasty Survival?

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Abstract

One contested contraindication to medial unicompartmental knee arthroplasty (UKA) has been status of the patellofemoral joint. Surgeons have avoided UKA when the patellofemoral joint has radiographic evidence of arthritic changes. However, recent studies advocate ignoring patellofemoral joint status when considering UKA. The purpose of this study was to compare the failure rate of mobile-bearing, medial UKA in patients with and without preoperative radiographic evidence of patellofemoral joint degeneration. Preoperative radiographs from a random selection of 503 patients (638 knees) treated with UKA for anteromedial osteoarthritis were assessed by an observer blinded to clinical outcome. The patellofemoral joint was graded using the modified Altman classification from 0 to 3 with 0 being no evidence of changes and 3 being severe, and identified 396 grade 0, 168 grade 1, 65 grade 2, and 9 grade 3 knees. At 1- to 7-year follow-up, there have been 17 revisions for overall survivorship of 97.3%. Kaplan-Meier analysis predicted 97.9% survival in knees with patellofemoral joint disease and 93.8% survival in knees without patellofemoral joint disease at 70 months ($P=1$). Failure requiring revision occurred in 3.5% (14/396) of grade 0 knees, 1.2% (2/168) of grade 1, 1.5% (1/65) of grade 2, and 0% (0/9) of grade 3. No survival difference was noted between knees with medial or lateral patellofemoral joint disease ($P=.1$). No knees were revised for progression of disease in the patellofemoral joint or anterior knee pain. In light of this investigation and the work of others, preoperative radiographic changes in the patellofemoral joint can be safely ignored when considering patients for medial UKA without compromising survivorship.

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Since 1989, the so-called Kozinn and Scott indications for unicompartmental knee arthroplasty (UKA) have been contested. If complete adherence to their criteria was maintained, the percentage of patients with osteoarthritis of the knee who would be suitable candidates for UKA has been shown to be approximately 6%.3,4

Unicompartmental knee arthroplasty holds many advantages over total knee arthroplasty (TKA). The literature demonstrates that UKA produces better range of motion, greater level of activity, and overall higher levels of patient satisfaction as compared to TKA.1,4 In light of these advantages, the reemergence of the UKA over the past decade has fostered investigations that consider and evaluate more liberal indications for the UKA.5,6

One such contested contraindication to medial UKA has been the status of the patellofemoral joint. Traditionally, surgeons have avoided UKA when a patient’s patellofemoral joint has radiographic evidence of osteophytes, narrowing, and/or sclerosis. However, in recent literature, there has been a movement towards ignoring the status of the patellofemoral joint when considering UKA for anteromedial osteoarthritis.7,8 The purpose of this study was to compare the failure rate of mobile-bearing, medial UKA in patients with and without radiographic evidence of preoperative patellofemoral joint arthritis or degeneration.

**Materials and Methods**

The study includes data from 503 patients who underwent 638 medial UKAs for anteromedial osteoarthritis with standard surgical procedure. These cases were randomly selected from our electronic database of 2000 medial UKA performed by 2 surgeons (A.V.L., K.R.B.) between 2004 and 2010 based on accurate and complete pre- and postoperative radiographic series. Mean patient age at the time of surgery was 62.7 years (range, 33-90 years). There were 233 men and 270 women, who underwent 368 unilateral and 135 bilateral procedures. Average patient height was 64.7 inches (range, 58-78 inches), weight was 209.8 lbs (range, 125-351 lbs), and BMI was 32.4 kg/m² (range, 20-49 kg/m²).

All patients had anteromedial osteoarthritis, and none were excluded based on the preoperative status of their patellofemoral joint. As a routine part of the preoperative work-up, an anteromedial skyline view was taken of the patient’s knee flexed to approximately 30°. A trained observer (K.R.B.), blinded to clinical outcome of the patient, then graded the patellofemoral joint from the patient’s preoperative radiographs. The modified Altman classification,9 which evaluates medial and lateral joint space for narrowing, marginal osteophytes, and subchondral sclerosis, was used to grade the extent of radiographic changes. The patellofemoral joint was graded from 0 to 3 (Figure 1) with 0 being no evidence of patellofemoral changes and 3 being severe changes to the patellofemoral joint.

Ultimately, risk of revision was compared between patients with and without radiographic patellofemoral joint disease using Log-rank and Kaplan-Meier analysis. Power to detect a difference in risk for revision was found to be 80% at P = .05.

**Results**

Of the 638 knees, 396 (62%) had Altman grade 0 patellofemoral joint changes, 168 (26%) had grade 1 changes, 65 (10%) had grade 2, and 9 (1%) had grade 3. Currently, with follow-up from 1 to 7 years, there have been a total of 17 (2.7%) revisions, placing the overall survivorship of the medial UKA in this study at 97.3%. Kaplan-Meier analysis predicted a 97.9% survival in knees with patellofemoral joint disease and 93.8% survival in those knees without patellofemoral joint disease at 70 months (P = .1).

When considering failure incidence according to patellofemoral grade in this study’s patient population, where failure is defined as the need for revision of the UKA, 3.5% (14/396) of grade 0 knees failed (Figure 2), 1.2% (2/168) of grade 1 knees failed, 1.5% (1/65) of grade 2 knees failed, and 0% (0/9) of grade 3 knees failed (Figure 3). The most common reason for failure was loosening of the tibia, which occurred in 1.3% (8/638) of UKAs in this patient population. While pain was the impetus for revision in .8% (5/638) of UKAs, tibial overload accounted for revision in .3% (2/638) of this cohort’s UKAs, and revision because of either fracture or infection were responsible for .2% (1/638) of the UKAs in this study.

In total, radiographically significant disease (grade 2 or more) was present in 74 (12%) knees, and again, no difference in survivorship was observed in these cases. No survival difference was noted between knees with medial or lateral patellofemoral joint disease (P = .1). No knees were revised for progression of disease in the patellofemoral joint or anterior knee pain.
OUTCOMES WITH A MEDIAL UKA.

There exists between preoperative evidence that no significant correlation exists between preoperative evidence of patellofemoral joint arthritis and poor outcomes with a medial UKA. There was significant patellofemoral joint disease in 12% of the knees in this study and any amount of patellofemoral joint osteoarthritis in 38% of knees in this study; nevertheless. These patients fared no worse than those with no radiographic evidence of patellofemoral degenerative disease. This is in concordance with similar studies, by Beard et al. investigating the influence of the patellofemoral joint status on medial UKA outcomes. In these investigations, as in this study, there was no statistical difference between patients with and without patellofemoral joint degeneration. Thus, it is the contention of the authors that radiographic changes in the patellofemoral joint do not effectively predict survival of medial unicompartmental knee arthroplasty.

Our data suggests that moderate lateral facet patellofemoral joint disease can also be safely ignored without progression or anterior knee pain resulting in need for revision. This finding is dissimilar from findings in another study that associate lateral patellofemoral joint disease with negative outcomes. There is a bias in the current study in that patients with severe lateral patellofemoral joint subluxation and grooving may have not been offered UKA, and thus, no conclusion can be drawn in patients with severe lateral facet disease.

In light of this investigation and taking into account the work of others on medial UKA outcomes, the authors contend that preoperative radiographic changes in the patellofemoral joint can be safely ignored when considering patients for medial UKA without compromising survivorship.

REFERENCES