The Influence Of Patellofemoral Degenerative Changes On The Outcome Of The
Unicompartmental Knee Replacement

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Introduction: Unicompartmental knee arthroplasty (UKA) is a recognized procedure for treatment of medial compartment osteoarthritis. Patellofemoral (PF) joint degeneration is widely considered to be a contraindication to medial unicompartmental knee replacement. We examined the validity of this preconception using information gathered prospectively on consecutive patients who underwent UKA using the Repicci II® UKA prosthesis for medial compartment osteoarthritis.

Methods: We prospectively collected data on 147 consecutive patients who underwent the Repicci II® UKA for medial compartment osteoarthritis. All operations were performed between July 1999 and September 2000 by the same surgeon. The status of the PF joint was assessed intra-operatively in all patients, and accordingly patients were divided into two groups, one group with a normal PF joint, and the second group with degenerative changes of the PF joint.

Variables measured for outcome included the International Knee Society (IKS) score, limb alignment, and range of motion. Radiographs were assessed for progression of disease or failure of implant. The mean follow-up was 9.4 years (range: 5-10.7 years).

Patients were reviewed initially at 2 weeks, and then at 6 months post-operatively. They were subsequently reviewed on an annual basis. All patients completed an IKS score preoperatively and at last follow-up. Age, gender, BMI, length of hospital stay, perioperative complications, all subsequent surgery, including revision of the prosthesis, and survivorship at 10 years was recorded, and results of the 2 groups compared.

Results: A total of 147 patients were included in the study. None were lost to follow-up. Sixty nine had associated PF osteoarthritis (group A) while 78 patients had a normal PF compartment when assessed intra-operatively (group B).

Post-operative outcomes of the two groups were compared using the ANCOVA analysis with adjustment for pre-operation values firstly, and adjusting also for gender, age, BMI and follow-up secondly.

There were no significant differences in terms of IKS, alignment, and flexion between the two groups. However, patients in group B had significantly better extension post-operatively than patients in group A (p<0.05).

Discussion: There was a significant improvement in IKS scores with patients in both groups, but no significant difference in the range of improvement in those who had PF disease compared to those that did not.

There was no significant difference in the 2 groups in improvement in post-operative flexion, which was small in both groups. However, those patients with PF disease had significantly less extension than those with a normal PF compartment. Reasons for this remain unclear.
Fifteen patients in group A eventually had revision of their UKA to TKA. Eight of these were revised for progression of disease to the lateral compartment in 4 cases and to both lateral and PF compartment in the other 4 cases. Another 4 cases revised for subsidence of the tibial baseplate due to stress fracture. One patient had the UKA revised for unacceptable malalignment. Of these patients, 9 had a post-operative HKA axis of neutral or valgus, possibly contributing to the development of progressive arthritic disease, as it is known from previous studies that the ideal HKA angle following UKA is between -10 and -20 varus 29,30. All 7 patients in group B who had their UKA revised to a TKA had progression of disease to both PF and lateral compartment except one case where the progression was to the lateral compartment only. Two of these had a post-operative HKA axis of 100 valgus, while another 3 had an angle of neutral/valgus. The most common overall reason for revision was therefore progression of disease to other compartments, and the only correlating factor for this was overcorrection of the HKA angle. This, in our opinion, would suggest that the presence of pre-existing asymptomatic PF disease does not in itself contribute to the development of symptomatic other compartment disease.

Furthermore, after excluding the cases which was revised due to subsidence and aseptic loosening we find no statistically significant difference in Revision rate between the 2 groups due to disease progression alone.

Full thickness PF cartilage degeneration has been considered by some to be a contraindication to the use of UKA, as the outcome was thought to be inferior in these patients.13,14,31 However, our results suggest that this is not the case.

There are several reasons that may explain this finding. The improved mechanical alignment resulting from UKA can reduce any overload of the PF joint from a varus deformity. The painful articulation between the worn medial condyle and the PF joint is improved by the presence of a new contact surface provided by the UKA. Additionally, the removal of osteophytes from the medial femoral condyle that were causing wear to the PF joint eliminates a further potential pain source. PF joint wear and full thickness cartilage loss has been found to be a very common feature in post mortem studies of elderly patients.32. It is possible that much of the cartilage loss may be asymptomatic, and therefore unlikely to influence the outcome.

There is a general lack of data on the outcome of minimally invasive resurfacing type UKA. The technique of implantation has been described before19, and involves burring of the joint surfaces removing the bare minimum of articular cartilage and bone. Other techniques rely on greater resection of bone and the use of a tibial baseplate. Whether the presence of asymptomatic PF disease adversely affects outcome based on the type of UKA implant and technique used is unclear, and possibly warrants further research.

There are several limitations to our study. Firstly, the number of patients in each group is relatively small, although not when compared to other published reports on this subject26. It is only a review of minimally invasive resurfacing UKA, and not of other types of UKA. The mean age of our patients was 68 years, and therefore the results may not be generalisable to other age groups also, as all the patients included could localize their pain to the medial compartment one can argue that different findings might results if the procedure were performed on patients with symptomatic PF arthritis and further study is needed to assess that possibility.

In conclusion, our study demonstrates that asymptomatic patellofemoral joint wear to the extent of full-thickness cartilage loss does not influence the long term functional results and revision rate of UKA
when compared to the procedure in patients without PF disease. However, extension is significantly improved post-operatively in those patients with minimal or no PF joint degenerative disease. We believe that our study conclusively shows that UKA is a viable alternative to other techniques for bicompartmental degenerative disease of the knee when the patient has asymptomatic disease of the PF joint.

**Significance:** We concluded that damage to the articular cartilage of the patellofemoral joint to the extent of full-thickness cartilage loss is not a contraindication to the Repicci II® unicondylar knee arthroplasty for medial compartment osteoarthritis. However, extension is significantly improved post-operatively in those patients with minimal or no PF joint degenerative disease.

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