THA Patients Experience Better Functional Outcomes Than Their TKA Counterparts

SUMMARY

Both total hip arthroplasty (THA) and total knee arthroplasty (TKA) are deemed to be highly successful and cost-effective procedures for relieving pain and improving function. However, some studies have reported better pain relief and functional improvement after THA (\textit{Int J Technol Assess Health Care}. 1997 Fall;13[4]:575-88, and \textit{J Arthroplasty}. 1995 Dec;10[6]:742-7). It is certainly possible that various differences between the patient populations are responsible for some of these results. With this in mind, Choi et al. compared THA and TKA groups and accounted for possible confounding variables in terms of whether there are any differences in clinical outcomes between these procedures.

The authors based their work on preoperative and prospectively collected two-year follow-up data from their joint registry. The authors analyzed a total of 349 patients (194 who received a THA and 155 who received a TKA). The data included multiple parameters including age, sex, comorbidities, body mass index, and Short Form (SF)-12 and Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC) scores. The authors estimated the differences in postoperative WOMAC and SF-12 scores between the two cohorts, and they controlled for the potential confounders.

The authors found that patients who underwent TKA had more factors that produced negative postoperative outcomes compared with those who underwent THA. However, when they controlled for the possible confounding by these variables, the patients who underwent THA still had a better functional outcome as evaluated by the SF-12 physical ($p = 0.029$) and mental ($p = 0.049$) components. The patients who underwent THA also exhibited better WOMAC scores ($p < 0.05$).

DISCUSSION

The finding that THA results appear to be better in the short term than TKA results supports similar conclusions made by other investigators, including Bourne et al. (\textit{Clin Orthop Relat Res}. 2010 Feb;468[2]:542-6). In that study, the patients who underwent THA were more willing to have surgery again and had greater changes in WOMAC scores, with more patients satisfied and having their expectations met.
This is a quite useful study because it confirms a lot of the beliefs that we have about THA compared with TKA. Rather than anecdotally noting that our patients have better results, we have more data on which to base these statements. The authors have done a notable job of controlling for any possible selection bias, and this is a good example of how to conduct this type of comparison study.

This study further underscores the challenge of determining what factors (whether they are related to the preoperative state, surgical technique, prosthesis, and/or pain and rehabilitation) may influence and improve the results of TKA. In addition, a longer-term comparison of the two procedures would be of interest.

Rotating-Platform Versus Fixed-Bearing TKA: Not Clinically Different in the Near Term

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SUMMARY
Kalisvaart et al. conducted a randomized controlled trial of 240 patients receiving total knee arthroplasty (TKA) and compared the maximum flexion (range of motion), function (Knee Society function score and stair climbing), and durability (revision rate) at five years. The three tibial bearing groups consisted of an all-polyethylene fixed bearing (FB) (eighty patients), a metal-backed FB (eighty patients), and a unidirectional rotating platform (RP) (eighty patients), and the groups were well matched by demographics and surgeon. Data were compared for two-year and five-year follow-ups. There were no significant differences in measured outcomes at either end point. There were four revisions: one all-polyethylene FB due to patellar fracture, two metal-backed FBs due to aseptic loosening, and one RP due to deep infection. The authors conclude that the RP design is reliable and durable; however, it was not significantly better in the intermediate term.

DISCUSSION
Rotating-platform TKA is intellectually appealing to surgeons because of the belief that “they can self-align and accommodate small mismatches in the rotational position of the tibial and femoral components.” Thus, the expectation is that these designs will provide better flexion and better function than fixed-bearing TKAs.

The authors clearly list several scientific advantages of this study: (1) reduction of variability—use of a single TKA design, (2) well-matched study groups—demographics did not differ between groups, and (3) consistent protocols—rehabilitation and surgical protocols consistent across groups.

They also note some limitations: (1) the clinical outcomes tool (Knee Society score) may lack sensitivity to detect the most subtle differences in pain and function between fixed-bearing and rotating-platform TKA and (2) the intermediate follow-up may not provide sufficient time for survival rates, long-term wear, and osteolysis to become evident.

The potential theoretical advantages of RP posterior-stabilized designs include decreased polyethylene wear, decreased fixation stresses, decreased aseptic loosening, increased protection of constraining mechanisms, and possible increased protection against late polyethylene tibial post failure for posterior-stabilizing designs.

Kalisvaart et al. are correct in stating that their second limitation is “insufficient time for survival rates,” and although two incidents of aseptic loosening failures in the FB group versus none in the RP group are not enough to make a significant statement, the need for longer-term follow-up is certainly warranted.
How Long Does Nasal Decolonization Last?

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SUMMARY

Periprosthetic infections remain a major problem after joint arthroplasties. Studies have shown that Staphylococcus aureus (SA) nasal colonization can significantly increase the risk of developing a postoperative surgical site infection (J Hosp Infect. 1995 Sep;31[1]:13-24). It has also been established that the prevalence of SA carriage in the anterior nares of the general population is approximately 30% (J Antimicrob Chemother. 2008 Feb;61[2]:254-61), which includes a methicillin-resistant SA carriage rate of 2.17% (J Bone Joint Surg Am. 2010 Aug 4;92[9]:1815-9). Several studies have shown that the eradication rate of organisms can be approximately 80% to 93% after a protocol of nasal decolonization (N Engl J Med. 2002 Jun 13;346[24]:1871-7, and Clin Infect Dis. 2002 Aug 15;35[4]:353-8). However, other studies have shown that these effects may be only temporary (Antimicrob Agents Chemother. 1999 Jun;43[6]:1412-6, and Cochrane Database Syst Rev. 2003;4:CD003340). Because of these issues, Immerman et al. determined the duration of decolonization provided by a five-day course of intranasal mupirocin and a single preoperative chlorhexidine shower by assessing true decolonization rates.

This was a retrospective review of 5638 patients undergoing total joint arthroplasty or spine surgery between January 2008 and March 2010. Every patient received a prescription for a five-day course of 2% mupirocin nasal ointment and a single preoperative chlorhexidine shower (Arthritis. 2010;2010:924518). The authors analyzed patients at multiple repeat visits, and they also carefully analyzed patients with positive culture results. They grouped patients into three categories: group 1 (persistent nasal decolonization), group 2 (recolonization or failed decolonization), and group 3 (newly colonized).

Of the more than 5000 patients screened, 610 (10.8%) were seen twice or more often and constituted the main patient cohort. The authors found that methicillin-resistant SA decolonization persisted in 61% of patients at a mean of 159 days (group 1). The authors also found that the rate of new colonization was quite low: 0.4% at a mean of 156 days and 6.4% at a mean of 254 days.

DISCUSSION

These authors have shown that the efficacy of the decolonization protocol declines with time between treatment and retesting. This is quite useful information, although there are some questions that were left unanswered. For example, many of the patients for whom the decolonization failed to persist might not have been initially decolonized, since they were not retested immediately after the protocol. However, in prior studies these authors have shown a >96% rate of compliance with mupirocin treatment. Therefore, failure of decolonization may not have contributed importantly to their results (Arthritis. 2010;2010:924518). This is a useful study as it indicates that, if this decolonization protocol is used and the patient does not undergo surgery within a reasonable period, the protocol needs to be repeated because of the decrease in efficacy with time.

Periprosthetic Joint Infection: Is It Me or My Patient?

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SUMMARY

Jafari et al. studied fifty-five patients who presented with a periprosthetic joint infection (PJI) and had more than one prosthetic joint in place at the time of diagnosis; all of the primary procedures were done at the authors’ institution. Forty-
Emetic events are still a problem after the performance of lower extremity total joint arthroplasty, with various studies reporting incidences between 20% and 81% (Clin Orthop Relat Res. 2010 Sep;468[9]:2405-9, Anaesthesia. 2010 May;65[5]:500-4, Pain Pract. 2010 May-Jun;10[3]:245-8, and Knee Surg Sports Traumatol Arthrosc. 2010 Jul;18[7]:916-22). These events commonly occur even with newer multimodal approaches to pain control. In addition, there have been many reports that show varying responses to specific antiemetic drugs (Anesth Analg. 2003 Jul;97[1]:62-71, J Perianesth Nurs. 2006 Dec;21[6]:385-97, and Drugs. 2000 Feb;59[2]:213-43). The most commonly used antiemetic drugs are serotonin receptor antagonists; these typically have only a short duration of action and are limited to an antivomiting action rather than an antinausea action. Ramosetron is a newer serotonin receptor antagonist that may have a more potent and longer-acting property. However, this newer agent has not been evaluated concerning its antiemetic efficacy and its value for pain management, which is what Koh et al. studied in a carefully designed Level-I study of patients undergoing total knee arthroplasty.

The authors randomized 119 patients undergoing total knee arthroplasty between September 2009 and February 2010 to Ramosetron Reduces Early Emesis but Has No Influence on Pain After Total Knee Arthroplasty

**SUMMARY**

Ramosetron Reduces Early Emesis but Has No Influence on Pain After Total Knee Arthroplasty


**DISCUSSION**

On the surface, this study seems to represent an interesting report of a rare problem, but the implications are more important. Several articles have recently identified patient risk factors for PJI (such as diabetes, obesity, and anemia), suggesting that patients who develop an infection are in some way “different” from those who do not.

Furthermore, experience at my institution shows that when patients develop recurrent PJI (after what appears to have been successful eradication), it is striking that the majority of recurrent infections seem to be associated with a new infecting organism as opposed to the organism that was originally cultured from the joint. Combining these three items of knowledge—that we can identify independent risk factors for infections, that recurrent infections appear to be new infections, and that patients who develop an infection in one replaced joint have a high risk of developing an infection in another replaced joint, typically with a different organism—makes an even stronger case that patients who develop PJI are in some way fundamentally different from those who do not. While we know some of the risk factors for PJI, there may be some deeper, as yet to be identified, genetic marker or immunologic defect that confers increased susceptibility.

Although the appropriate administration of perioperative antibiotics and overall aseptic technique is clearly critical for the prevention of PJI, it is increasingly clear that patient-related factors are instrumental in the development of this complication. With increased scrutiny of complications, and with PJI considered a “never event” (meaning that subsequent care related to the infection may not be reimbursed) in the United States, it is equally clear that policy makers have oversimplified what is a complex occurrence and, in many cases, are unfairly penalizing physicians and hospitals who are providing appropriate patient care.
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3. Farr J, Yao J. Chondral defect repair with particulated juvenile cartilage allograft. ICRS 2010, Sept; e-Poster; 3863
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Additional Publications


**Farr poster publication** (study pts), Barcelona ICRS 2010. Dr. Farr’s subset of the ongoing 25-patient, multi-center prospective study, with the first 9 patients reaching up to 18 months post-op and demonstrating significant improvements in clinical outcomes over the pre-op baseline data. MRI data indicate good defect filling, and no revisions performed to date.

**Hatic and Berlet review**, Foot & Ankle Spec, Dec 2010. Discussion of DeNovo NT use and technique in osteochondral lesions of the talus.

**Ng podiatric arthroscopy technique poster**, ACFAS 2011. Case review of an osteochondral defect of the talus treated with DeNovo NT using an arthroscopically-assisted surgical technique. Patient returned to full unrestricted activity at 6 months post-op and was 16 months post-op at the time of the poster publication and remained very satisfied with the surgery.

**Mariash podiatric case review poster**, ACFAS 2011. Case review of an osteochondral defect of the talus treated with DeNovo NT using an open technique. 15-month MRI images suggested positive filling of the defect and no instability of the graft.

**Farr Chondral Defect Repair of the Knee, Cartilage**, July 2011. Case review of 4 patients with chondral lesions on the femoral condyle and/or trochlea treated with DeNovo NT. Patients are a subset of ongoing 25-patient, multi-center prospective study. Evaluation at 24 months post-op showed improved clinical outcomes and MRI data suggests good and persistent defect filling.

**Farr poster publication** (study pts), Montreal ICRS 2012. 12-month MRI images for 24 of the 25 patients enrolled in prospective, single-arm study. The majority of repair tissue was shown to be well-integrated and percent fill with repair tissue was also good with 89% of lesions demonstrating >75% fill. MRI results are consistent with improved clinical outcomes as compared to baseline.

**Adams Treatment of OC lesions in the talus**, Tech Foot Ankle Surg, June 2011. Article provides a brief review of surgical treatment options for symptomatic lesions and the particulated juvenile cartilage allograft transplantation technique for OC lesions of the talus.

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receive either ramosetron (sixty patients) or no prophylaxis (fifty-nine patients). The authors found that the use of ramosetron reduced the incidence of nausea (p = 0.017) but not the incidence of vomiting (p = 0.241). This beneficial antinausea effect occurred during the period of six to twenty-four hours after surgery. Unfortunately, pain levels and opioid consumption did not differ between the two groups.

DISCUSSION
One might consider using this agent for its antiemetic effect during the first six to twenty-four postoperative hours. Unfortunately, the lack of efficacy in other areas of the study (emetic events, pain control, and opioid use) tempered my enthusiasm for this agent. The authors are to be commended for performing an excellent prospective randomized trial that fits all of the criteria of a Level-I study. I appreciate the effort, and other investigators who want to plan trials can learn from how they constructed this work. This study also underscores the fact that even with modern-day multimodal pain management regimens, the incidence of nausea and vomiting is still quite common. The study further emphasizes the importance of trying to evaluate further measures to reduce emetic events after total knee arthroplasty.

How Good Are Unis Really?

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SUMMARY
The authors reviewed the reasons for failure of unicompartmental knee replacements (UKRs) and the clinical outcomes following subsequent revision. UKRs were performed in 132 knees at a single institution over a ten-year period, and thirty-three eventually required revision. Survival analysis was performed using Kaplan-Meier survival curves, and outcome assessments were based on Oxford Knee Scores.

The reasons for revision were aseptic loosening (50%), persistent pain (21%), dislocation of the meniscus (18%), malalignment (7%), and progression of osteoarthritis (4%).

The results were disappointing, with a five-year survival of only 69%. Eighteen of the revisions required additional constructs with stems, augments, or bone grafts. The mean one-year postoperative Oxford Knee Score was 29 points.

DISCUSSION
There has been an increased interest in UKRs, particularly given the results from Oxford. They are used because of the purported preservation of bone stock and cruciate ligaments as well as better knee kinematics. However, there is growing concern regarding their survivorship compared with total knee replacements (TKRs) and the inferiority of their clinical outcomes following revision.

This retrospective review of prospectively collected data lends further weight to these concerns, with a projected five-year survival of only 69% and a median time to revision of just under two years. Furthermore, revisions were not straightforward. Of those revised, 55% (eighteen of thirty-three) required augments, stems, or bone grafts. This does not necessarily support the bone preservation claims made for these devices. Quite interestingly, the authors showed that for a comparable group of patients treated at the same institution, the Oxford Knee Scores were significantly better (p = 0.001) in those patients who underwent a primary TKR rather than a UKR followed by a revision.

One might believe that the decision of which procedure to offer the patient is all about proper patient selection and excellent surgical technique, but these are two things that are hard to measure. I continue to offer UKR, but the rules for patient selection are blurring. With these and other results, can we still say that this procedure is bone-preserving? With the registry data from the United Kingdom showing that almost 30% of patients having UKRs are over seventy years of age, should we really be saying that this is a temporary procedure to delay TKR?
**Bilateral Comparison of Fixed-Bearing and Mobile-Bearing TKA in Younger Patients**

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**SUMMARY**

Kim et al. conducted a randomized controlled study comparing the longer-term follow-up of fixed-bearing (FB) versus mobile-bearing (MB) total knee replacements (TKRs). One hundred and eight patients, all younger than fifty-one years, underwent bilateral procedures in which they received both FB and MB designs. The patients were followed for a mean of 16.8 years (range, fifteen to eighteen years). There was no significant difference between groups in range of motion and Knee Society clinical and functional scores. The Kaplan-Meier survivorship, with revision for any reason as the end point, was 95% for the FB group (five revisions: one due to infection, two due to tibial aseptic loosening, and two due to tibial polyethylene wear) and 97% for the MB group (three revisions: one due to infection and two due to instability). The authors “found no superiority of the mobile-bearing total knee prosthesis over the fixed-bearing total knee prosthesis.”

**DISCUSSION**

The theoretical advantages of MB TKR are a decrease in osteolysis (by reducing polyethylene wear at both articulating and nonarticulating surfaces) and a decrease in aseptic loosening (by lessening fixation stresses).

Kim et al. noted three excellent strengths of their study: a large study population, a single institution, and a relatively long follow-up. They also noted that the single greatest limitation of their study was the geometric dissimilarities between the prostheses (i.e., FB cruciate-retaining versus MB cruciate-sacrificing designs). Although Kim et al. found no distinct advantage of the MB design in their analysis, there is a possible advantage of increased survivorship in the MB group. The FB group included four patients who underwent revisions due to aseptic loosening and polyethylene wear, while the MB group had no patients who underwent revisions for these reasons.

Although Kim et al. do not discuss it, another long-term, theoretical advantage is the possibly increased protection of constraining mechanisms when using MB designs. Therefore, their report may actually affirm the theoretical advantages touted for MB TKR designs; there were no revisions for aseptic loosening or polyethylene wear in the MB group compared with four revisions in the FB group.

**What Are the Prevalence and Magnitude of Anterior Knee Pain After Appropriate Patellar Resurfacing?**

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**SUMMARY**

There has been controversy over whether a patellar replacement should be routinely performed after total knee arthroplasty (TKA). There have been many complications reported with patellar replacement, including fracture, osteonecrosis, patellar subluxation, dislocation, and loosening, and many patients will have anterior knee pain (J Bone Joint Surg Am. 2002 Apr;84A[4]:532-40, Knee. 2000;Dec 4;7[4]:199-204, Clin Orthop Relat Res. 1988 Dec[237]:184-9, and J Bone Joint...
Because of these issues, Meftah et al., who routinely replace the patella in TKAs, analyzed their technique in relation to various preoperative and postoperative radiographic parameters and investigated any correspondence with anterior knee pain.

Between January 2007 and May 2008, 100 consecutive TKAs were carefully evaluated. The authors used a specialized patient-derived outcome questionnaire that included the presence of any anterior knee pain, asymptomatic crepitation, and painful crepitation. Meftah et al. performed their TKAs according to previously described techniques, and they gave special attention to maintaining the blood supply to the patella by preserving as much of the infrapatellar fat pad as possible and avoiding formal lateral releases (J Bone Joint Surg Am. 2005 Sep;87[Suppl 1]:271-84). In their proposed technique, the articular surface of the lateral facet of the patella is excised to the depth of the subchondral bone, and the medial facet is then cut parallel to the anterior surface.

At a mean follow-up of 3.7 years (range, 2.6 to 4.3 years), patients had a mean range of motion of 117° (range, 95° to 145°) and radiographic analysis showed no malalignment or osteolysis. Lateral releases were not performed in any case. The prevalence of any knee pain was 15%, including anterior knee pain (range, 0 to 3 on visual analog scale) present in 11% of the patients, with none reporting severe or disabling pain. The overall prevalence of patellar crepitation was 3%, with one patient requiring scar excision.

**DISCUSSION**

This is an interesting study, and one of the findings that I found important is that there was no correspondence between any of the radiographic measurements and anterior knee pain. This confirms the results of many previous studies that anterior knee pain without crepitation is enigmatic, and the rate without identifiable cause ranges from 4% to 21% in the literature (Clin Orthop Relat Res. 1988 Dec[237]:184-9, J Bone Joint Surg Br. 1996 Mar;78[2]:226-8, and J Bone Joint Surg Br. 1994 Nov;76[6]:930-7). Fortunately, the current patients had a low severity of this pain with use of the authors’ techniques. This is an interesting and thought-provoking study for which the authors should be commended. In addition, it would be helpful to repeat the study with a comparison control group who did not receive patellar replacement or perhaps who underwent another technique for patellar placement.


**Warn Your Total Knee Arthroplasty Patients About Airport Travel**

**SUMMARY**

Since the events of September 11, 2001, airport security has increased, which might lead to increased detection of patients with knee arthroplasties. One might presume that this would lead to potential delays and inconvenience for these patients. The purpose of the study by Naziri et al. was to characterize the efficacy of airport metal detection for patients who had total knee arthroplasty (TKA) and assess their inconvenience and whether implant identification cards affected the likelihood of further inspection.

These authors studied 209 consecutive patients with a TKA at their one-year appointment. The patients were given a very detailed questionnaire that involved their experiences while traveling. Of the 209 patients, ninety-seven reported passing through airport security within the twelve months preceding their clinic visit (seventy-one traveling only within the United States and twenty-six traveling internationally). Of the ninety-seven patients, seventy (72%) reported triggering the alarm. Twenty-one patients reported having to undergo further inspection with hand-held metal detectors and being patted down after triggering the alarm. Of the sixty patients who triggered the alarm and had an implant identification card, only fifteen (25%) underwent further screening. Of note, thirty of the patients reported tripping alarms at other locations, including courthouses, federal buildings, and amusement parks.
DISCUSSION
This is an interesting study that describes the almost universal rate of detection of patients who have even a single implant. Tight airport security is vital for doing as much as possible to guarantee safety; the importance of this study lies in letting patients know about these alarms and know that they should expect to undergo a delay. It appears that the use of an implant identification card can reduce some of the delays and inconvenience for these patients. Based on the results of this study, we should all be educating patients who have lower-extremity total joint arthroplasties so that there will be no misunderstanding and so that they can decrease their level of anxiety when they are delayed and can, in turn, plan their trip time more accordingly.

Do High-Flexion Total Knee Arthroplasty Designs Lead to Improved Motion?

SUMMARY OF: Song EK, Park SJ, Yoon TR, Park KS, Seo HY, Seon JK. Hi-Flexion and Gender-Specific Designs Fail to Provide Significant Increases in Range of Motion During Cruciate-Retaining Total Knee Arthroplasty.


Michael A. Mont, MD
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SUMMARY
Various implant manufacturers have designed total knee arthroplasty (TKA) implants in an attempt to achieve better flexion. However, one may question whether the knee flexion achieved is more the result of the patient population or of the surgical technique than of the actual design. Song et al. evaluated a knee arthroplasty design developed for women that purportedly avoids overstuffing during flexion. Because there are few studies comparing the range of motion of these different types of cruciate-retaining (CR) knee designs, Song et al. compared similar high-flexion and standard CR TKA designs.

The authors studied only female patients who did not have a severe deformity (>20° of varus or >30° of flexion contracture) and who were undergoing a TKA. They evaluated forty primary TKAs performed in forty women between April 2007 and July 2007. After bone cuts for the standard CR knee and soft-tissue release were performed, a standard CR trial component was inserted. The authors then measured maximal flexion and extension using a navigation system as previously described (J Arthroplasty. 1998 Aug;13[5]:500-3, and J Arthroplasty. 2006 Aug;21[5]:623-7). Afterward, additional posterior bone cutting was performed, and high-flexion and sex-specific trial knee components were inserted sequentially without additional soft-tissue procedures. All of these knee arthroplasties had the same tibial baseplate and polyethylene insert designs. Again, maximal extension and flexion were evaluated. After the evaluation, the actual high-flexion knee component was implanted. The authors found minimal differences in the mean intraoperative maximal flexion among the standard CR, the high-flexion CR, and the sex-specific knees, with all being between 134° and 136°. All of the knees had >125° of flexion after the trials.

DISCUSSION
I like this study because these authors were able to compare the results in the same patient, thus eliminating the variables of different preoperative range of motion, anatomic features, and soft-tissue contractures that are inherent in any study comparing different patients. The authors used the same technique and quite similar designs for the tibial baseplate, and they were able to evaluate range of motion in a rigorous controlled manner using computer-assisted navigation. This was a small study involving a group of forty female patients. There may still be differences between the different designs that these authors could not detect. Further work concerning the effects of these new designs on range of motion needs to be performed, although I remain skeptical about whether some of the designs indeed lead to increased range of motion for patients.