

TOPIC COLLECTION: ISSUES IN ARTHROPLASTY CARE

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Letter from the Editor

The number of patients undergoing hip or knee arthroplasty is increasing, due in considerable part to the increasing prevalence of obesity. This rise has led to an increasing number of clinical decision points for both surgeons and primary care physicians. In the NEJM article, The HEALTH Investigators suggest that hemiarthroplasty (replacement of only the femoral head) in patients with displaced fractures of the femoral neck may be more appropriate than total arthroplasty despite expert recommendations to the contrary. A similar assessment of partial (single compartment) versus total knee arthroplasty showed that patients were more satisfied with partial procedures and complications were more frequent with total arthroplasty. The study by Giori and colleagues questions the value of arbitrary BMI thresholds for determining eligibility for hip or knee arthroplasty. The authors found that the rate and profile of complications in patients with a BMI >40 kg/m² (a typical cutoff point for many surgeons) are similar to that of patients with a lower BMI.

The study by Buhagiar et al. questions the value of inpatient-based and clinic-based rehabilitation for patients with knee arthroplasty. Loosely structured home-based rehabilitation may be as effective and less expensive. Finally, the increasing use of aspirin prophylaxis to prevent venous thromboembolism in patients undergoing total joint arthroplasty appears to produce lower mortality rates than other antithrombotic agents, which is reflected in the increasing preference for aspirin.

These and other studies suggest that primary care physicians and surgeons need to communicate regularly about the most current ways to manage the total course of arthroplasty care, from selection of the procedure to rehabilitation.

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Total Hip Arthroplasty or Hemiarthroplasty for Hip Fracture

The HEALTH Investigators*

ABSTRACT

BACKGROUND

Globally, hip fractures are among the top 10 causes of disability in adults. For displaced femoral neck fractures, there remains uncertainty regarding the effect of a total hip arthroplasty as compared with hemiarthroplasty.

METHODS

We randomly assigned 1495 patients who were 50 years of age or older and had a displaced femoral neck fracture to undergo either total hip arthroplasty or hemiarthroplasty. All enrolled patients had been able to ambulate without the assistance of another person before the fracture occurred. The trial was conducted in 80 centers in 10 countries. The primary end point was a secondary hip procedure within 24 months of follow-up. Secondary end points included death, serious adverse events, hip-related complications, health-related quality of life, function, and overall health end points.

RESULTS

The primary end point occurred in 57 of 718 patients (7.9%) who were randomly assigned to total hip arthroplasty and 60 of 723 patients (8.3%) who were randomly assigned to hemiarthroplasty (hazard ratio, 0.95; 95% confidence interval [CI], 0.64 to 1.40; $P=0.79$). Hip instability or dislocation occurred in 34 patients (4.7%) assigned to total hip arthroplasty and 17 patients (2.4%) assigned to hemiarthroplasty (hazard ratio, 2.00; 99% CI, 0.97 to 4.09). Function, as measured with the total Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC) total score, pain score, stiffness score, and function score, modestly favored total hip arthroplasty over hemiarthroplasty. Mortality was similar in the two treatment groups (14.3% among the patients assigned to total hip arthroplasty and 13.1% among those assigned to hemiarthroplasty, $P=0.48$). Serious adverse events occurred in 300 patients (41.8%) assigned to total hip arthroplasty and in 265 patients (36.7%) assigned to hemiarthroplasty.

CONCLUSIONS

Among independently ambulating patients with displaced femoral neck fractures, the incidence of secondary procedures did not differ significantly between patients who were randomly assigned to undergo total hip arthroplasty and those who were assigned to undergo hemiarthroplasty, and total hip arthroplasty provided a clinically unimportant improvement over hemiarthroplasty in function and quality of life over 24 months. (Funded by the Canadian Institutes of Health Research and others; ClinicalTrials.gov number, NCT00556842.)

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Hemiarthroplasty vs. Total Hip Arthroplasty for Displaced Femoral Neck Fractures

Outcomes were similar in a randomized comparison of these approaches.

Hemiarthroplasty (replacement of only the femoral head) and total hip arthroplasty (replacement of both the femoral head and acetabulum) are both options for patients with displaced fractures of the femoral neck; each approach has certain advantages and disadvantages. In this international randomized trial, researchers compared the two procedures in 1495 patients.

The primary endpoint — another hip procedure required and performed within 24 months — occurred in 8% of patients in both groups. Nonsignificant trends suggested more adverse events and more hip-related complications with total hip arthroplasty than with hemiarthroplasty. Conversely, some measures of pain and function favored total hip arthroplasty compared with hemiarthroplasty, but differences were small and did not meet standard thresholds for clinical importance.

COMMENT

A guideline from the American Academy of Orthopaedic Surgeons (*J Am Acad Orthop Surg* 2015; 23:131) states that “moderate evidence supports a benefit to total hip arthroplasty in properly selected patients with unstable (displaced) femoral neck fractures.” However, the authors of the current study conclude that “the advantages of total hip arthroplasty may not be compelling.” Their results support current U.S. practice, in which the less complicated procedure — hemiarthroplasty — is done more commonly than total hip arthroplasty for displaced femoral neck fractures.

— **Allan S. Brett, MD**

The HEALTH Investigators. Total hip arthroplasty or hemiarthroplasty for hip fracture. N Engl J Med 2019 Sep 26; [e-pub]. (<https://doi.org/10.1056/NEJMoa1906190>)

Partial vs. Total Knee Arthroplasty

In selected patients with medial compartment arthritis, partial knee arthroplasty compared favorably with total knee arthroplasty.

Patients with advanced knee osteoarthritis that is isolated to a single compartment (medial tibiofemoral, lateral tibiofemoral, or patellofemoral) are potential candidates for partial, unicompartmental knee arthroplasty (PKA) or total knee arthroplasty (TKA). However, observational data suggest that patients who undergo PKA are at higher risk for early revision than those who undergo TKA (*NEJM JW Gen Med* May 1 2019 and *BMJ* 2019; 364:352). In this trial from the U.K., 528 patients with isolated medial-compartment osteoarthritis — all of whom were considered to be suitable for PKA according to standard criteria — were randomized to PKA or TKA.

At 5 years, standardized knee scores (assessing function and pain) were similar in the two groups, but PKA patients were more likely to say they “would choose to have the operation again”

(91% vs. 84%; $P=0.01$). A broadly defined category of complications occurred more commonly with TKA than with PKA (27% vs. 20%; $P=0.04$), but numbers of reoperations were similar in the two groups. PKA was more cost-effective than TKA.

COMMENT

Primary care physicians should be aware that partial knee arthroplasty is an option for properly selected patients, assuming the availability of an orthopedist with appropriate expertise. However, the 5-year follow-up interval is a limitation of this report, given that knee replacement surgery is expected to confer longer-term benefit. Ten-year follow-up is planned for this study. — **Allan S. Brett, MD**

Beard DJ et al. The clinical and cost-effectiveness of total versus partial knee replacement in patients with medial compartment osteoarthritis (TOPKAT): 5-year outcomes of a randomised controlled trial. Lancet 2019 Jul 17; [e-pub]. ([https://doi.org/10.1016/S0140-6736\(19\)31281-4](https://doi.org/10.1016/S0140-6736(19)31281-4))

Evans JT and Whitehouse MR. Partial versus total knee replacement for knee osteoarthritis. Lancet 2019 Jul 17; [e-pub]. ([https://doi.org/10.1016/S0140-6736\(19\)31612-5](https://doi.org/10.1016/S0140-6736(19)31612-5))

Is Inpatient or Clinic-Based Rehabilitation Necessary After Total Knee Arthroplasty?

Home-based rehabilitation is just as effective for both pain and function at 10 and 52 weeks.

The rising volume of total knee arthroplasties (TKAs) in the U.S. has led to increased use of bundled payments for postoperative rehabilitation, which has focused attention on alternative settings for rehabilitation programs. In this meta-analysis, researchers analyzed pain and function outcomes reported in five randomized trials, conducted outside of the U.S., that involved 752 patients (mean age, 68). In each study, rehabilitation — either inpatient, clinic-based outpatient, or home-based — started shortly after TKA; home-based programs could be monitored or unmonitored.

Outcomes at 10 and 52 weeks were similar for mobility (e.g., 6-minute walk), range of motion, pain, and quality of life, regardless of rehabilitation setting. Some measures slightly favored home-based rehabilitation.

COMMENT

The number and size of studies in this meta-analysis were not large, but the meta-analysis findings indicate no basis for requiring TKA rehabilitation to take place in either inpatient or clinic-based settings. Home-based programs, even loosely structured and unmonitored, appear to work just as well (although patients with no social support at home might require brief inpatient rehabilitation).

— **Thomas L. Schwenk, MD**

Buhagiar MA et al. Assessment of outcomes of inpatient or clinic-based vs home-based rehabilitation after total knee arthroplasty: A systematic review and meta-analysis. JAMA Netw Open 2019 Apr 26; 2:e192810. (<https://doi.org/10.1001/jamanetworkopen.2019.2810>)

Aspirin Prophylaxis After Total Joint Arthroplasty

In a retrospective study, aspirin was associated with lower 30-day mortality than other agents.

Orthopedists are using aspirin increasingly to prevent venous thromboembolism (VTE) after total hip or knee arthroplasty. Because of aspirin's potential effect on arterial — in addition to venous — thrombosis, researchers in Philadelphia conducted this single-center retrospective study to examine whether aspirin prophylaxis might lower overall mortality after total joint arthroplasty. Between 2000 and 2017, 8000 patients received aspirin prophylaxis for 4 weeks, and 23,000 received other antithrombotic agents.

At 1 month, mortality was 0.1% with aspirin and 0.3% with other agents ($P=0.004$). In multivariate analysis, mortality remained significantly lower with aspirin (adjusted odds ratio, 0.4). Among 60 deaths in the nonaspirin group at 1 month, 24 were cardiac-related and 4 were VTE-related; among 7 deaths in the aspirin group, none were cardiac- or VTE-related.

COMMENT

One concern about this study is that aspirin prophylaxis became more prevalent during the latter part of the study timeframe; other changes in management of joint-replacement patients during those latter years also could have influenced these results. But, at the very least, the study provides reassurance that the increasing use of prophylactic aspirin after total joint replacement is reasonable. A large multicenter randomized trial comparing aspirin, warfarin, and rivaroxaban is underway.

— **Allan S. Brett, MD**

Rondon AJ et al. The use of aspirin for prophylaxis against venous thromboembolism decreases mortality following primary total joint arthroplasty. *J Bone Joint Surg Am* 2019 Mar 20; 101:504. (<https://doi.org/10.2106/JBJS.18.00143>)

BMI as an Eligibility Criterion for Hip or Knee Replacement

Researchers analyze tradeoffs between avoiding complications and denying access to surgery.

Orthopedists increasingly require patients to meet various criteria (e.g., body-mass index [BMI] or glycosylated hemoglobin below a certain threshold) before proceeding with total hip or knee arthroplasty; the rationale is to minimize complication rates. In this study, U.S. researchers used a veterans' healthcare database to estimate the tradeoffs if access to joint replacement were denied at various BMI thresholds.

Among nearly 28,000 patients who underwent hip or knee arthroplasty, the overall 30-day rate of major complications (e.g., cardiopulmonary, infectious, hemorrhagic) was 5.05%. Among the roughly 1200 patients with BMI ≥ 40 kg/m², the major-complication rate was 6.74%. If patients with BMI ≥ 40 had not been permitted to undergo surgery, 14 would have been denied complication-free surgery for every 1 who would have been spared a major postoperative complication. At BMI cutoffs of 35 kg/m² and 30 kg/m², the numbers of patients who would have been denied surgery for every complication avoided would have been 16 and 18, respectively.

COMMENT

The authors — two orthopedic surgeons and several nonphysicians — couched their discussion as an ethical issue, pitting patients' willingness to assume risks against surgeons' reasonable desire to limit high-risk elective surgeries. Because the complication rate in patients with BMI ≥ 40 wasn't dramatically higher than that in patients with lower BMIs, the authors argue that decisions to proceed with joint replacement should lie within the patient-physician relationship and not be dictated by strict institutional cutoffs.

— **Allan S. Brett, MD**

Giori NJ et al. Risk reduction compared with access to care: Quantifying the trade-off of enforcing a body mass index eligibility criterion for joint replacement. *J Bone Joint Surg Am* 2018 Apr 4; 100:539. (<http://dx.doi.org/10.2106/JBJS.17.00120>)