COMMENTARY & PERSPECTIVE

Cement Emerges As the Most Predictable Option for Hip Hemiarthroplasty

Commentary on an article by Fraser Taylor, BSc, MBChB, FRACS, et al.: "Hemiarthroplasty of the Hip with and without Cement: A Randomized Clinical Trial"

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It happens every day in our hospitals. A frail eighty-five-year-old woman with various medical problems is admitted with a displaced femoral neck fracture. After the workup, she is deemed fit for surgery with recommendations to "minimize hypotension and keep the hematocrit above 30." She is brought to the operating room late in the afternoon and the attending surgeon is asked, "Is this a cemented or press-fit hemiarthroplasty?"

The surgeon is fond of the shorter procedure time and the supposedly reduced cardiovascular effects associated with cementless arthroplasty, which would be valuable for this frail patient. However, on reviewing the radiographs, the surgeon notes osteopenia and a wide, patulous femoral canal. The surgeon is worried about failing to obtain a good press-fit, causing an intraoperative fracture, or seeing subsidence on the follow-up postoperative radiographs. Up until now, he or she has had to base the decision on limited literature that primarily employed old Austin Moore implants.

Taylor et al. have released the results of a randomized controlled trial comparing hemiarthroplasty with modern cemented and uncemented implants to treat a femoral neck fracture. One hundred and sixty patients were randomized, and outcomes were measured with use of validated functional outcome scores, visual analog pain scores, and complication rates. The results are quite compelling. The functional outcome scores were essentially the same in the two groups at six months and at one year postoperatively. The operating room time and intraoperative blood loss were virtually identical. The rate of cardiovascular and respiratory complications was identical.

However, the uncemented group had significantly more orthopaedic technical problems than the cemented group. The uncemented group had a 7.5% rate of intraoperative fractures and a 15% rate of postoperative fractures within two years. No intraoperative fractures and one postoperative fracture were observed in the cemented group. These differences were both significant at the key $p < 0.05$ level. Subsidence occurred in 22.5% of the uncemented prostheses and 1.3% of the cemented prostheses ($p < 0.001$). The reoperation rate was similar in the two groups.

The study had two significant limitations. First, forty-six patients were excluded from randomization because they were believed to be too frail for arthroplasty with cemented implants. Thus, the sickest population, which would in theory be most susceptible to cardiovascular collapse during placement of bone cement, was excluded. Unfortunately, this cohort represents the group in which surgeons are the most concerned about introducing bone cement, and the exclusion of these patients limits the generalizability of the study by biasing the study toward arthroplasty with cement. Second, the procedures were performed primarily by registrars. The technical complexity of press-fitting a femoral stem implant into osteopenic bone requires a degree of surgical experience before it can be properly employed. Therefore, studying inexperienced surgeons also biases the study toward arthroplasty with cement. That said, I submit that in the United States the majority of hip fracture care is undertaken by surgeons in the early stage of their practice, and it is rarely undertaken by surgeons who are dedicated to total joint replacement.

What, then, should the surgeon in our example do? The reality is that there is support for use of both press-fit and cemented hemiarthroplasty components for the treatment of femoral neck fractures. Given the multiple frailties and comorbidities of the population with such fractures, their true independence and functional status after the surgery probably has little to do with whether the prosthesis is fixed with cement or a press-fit interface, as long as a stable construct is obtained.

Knowing that the functional results of the two procedures were very similar, and that we are unlikely to have larger studies to identify a clinically meaningful difference, the decision-making perspective shifts toward choosing a procedure that causes the least complications. The results of the study by Taylor et al. demonstrate that obtaining a good press-fit in patients treated with hemiarthroplasty for hip fracture is challenging (as demonstrated by the higher intraoperative fracture rate and higher rate of postoperative

subsidence) and that the purported benefits of shorter operating room time and lower blood loss are nonexistent. Hemiarthroplasty with cement remains the gold standard against which all other procedures must be measured.

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