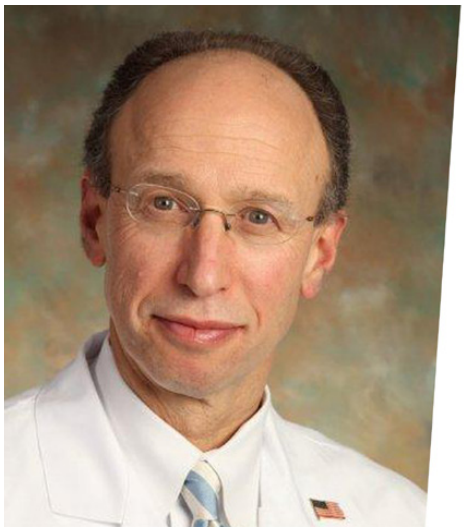
Hip Replacement: Data Challenges Cementless Technique

BY TRACEY ROMERO

Medicine is constantly evolving and changing including techniques used in orthopedic surgeries like total hip arthroscopy (THA). But is newer necessarily better?

Cementless THA is one advanced technique that many in the orthopedic community think offers better patient outcomes and streamline the surgical process; however, data show that periprosthetic fractures in the first few months postop are a serious concern, raising the question of whether surgeons should go back to cemented THA.



Joseph T. Moskal, M.D., FACS / Courtesy of the International Congress for Joint Reconstruction

Joseph T. Moskal, M.D, FACS, chairman, department of orthopedic surgery at the Carilion Clinic Medical Center and chief of Adult Reconstruction at the Carilion Clinic Medical Center in Roanoke, Virginia, recently talked about why orthopedic surgeons should revisit the role of cemented stems in THA.

The Epiphany

On November 21, 2012, Moskal had an epiphany about the THA techniques he uses in the OR when he saw three patients back to back: Two had cemented THAs and were doing extremely well, while the third patient, who just recently had a cementless THA and was only two weeks post-op, was experiencing pain and would need a revision.

He said that his mission as a doctor has always been to maximize patient outcomes and satisfaction, minimize patient complications and revision rates, maintain control of the patient care and maintain the ability to do what he enjoyed, so he really started to question himself.

"I needed to convince myself that I am not a bad guy and I am going to learn from this. I am most influenced by my last complication and I was committed to change," he said.

Realizing he never had this problem after performing a cemented THA, he asked himself what made him switch to cementless in the first place.

"So why did I switch from cemented to all cementless THA? To save time, to be able to do more procedures."

So, he looked closely at the patient outcomes from both types of THAs and found the biggest difference was in the number of periprosthetic fractures that occurred.

He compared his last 1,000 cementless THA using the direct anterior approach (2 to 5 years of follow-up) to his last 1,000 cemented THA with the Exeter Stem (12 to 20 years of follow-up). According to the data he compiled, more patients with cementless stems experienced a periprosthetic fracture, which tended to occur early postoperatively. There were nine intra-operative calcar fractures in this group. The rates of loosening and thigh pain were also higher in the cementless stem patient group.

The Data Don't Lie

Moskal wondered if it was just he who was experiencing these issues, but when he went digging, he found that other surgeons also have serious concerns about fractures with cementless THA.

According to an audience survey from International Congress for Joint Reconstruction's (ICJR) 7th Annual Winter

Hip and Knee Course in Vail, Colorado, in 2015, when asked what potential THA complication they worry the most often about, 100% of the audience responded intra-operative or early post-operative femoral fracture.

Moskal said that THA registry data also tells the same story. Cementless stems have twice the revision rate as the cemented stems, primarily resulting from twice the number of fractures.

He also pointed to the Australian registry data, which reported a higher rate of revision among patients with cementless implants than those with cemented in the first month after surgery. The Australian cementless fixation group had a higher rate of revision than the hybrid fixation group in all age groups, with the biggest difference registering in the oldest age group.

Data from the Finnish Registry published in "High Early Failure Rate After Cementless Hip Replacement in the Octogenarian" in *Clinical Orthopaedics and Related Research* in 2014, showed outcomes which were consistent with the Australian data.

In the Finnish study of 4,777 primary THAs in 4,509 octogenarian patients between 1998 and 2009, the cementless THAs had a higher, early revision rate (meaning less than 1 year) when compared with cemented THA, particularly in women and the leading reason for failure was periprosthetic fracture. After the first year though, there were no differences in the survival rates.

French Registry data published in "Association Between Total Hip Replacement Characteristics and 3-Year Prosthetic Survivorship: A Population-Based" in *Journal of American Medical Association Surgery* in 2015 reported that antibiotic-impregnated cemented THAs offer a better prognosis than uncemented THAs. The registry included 100,191 patients 40 years of age or older who underwent THA in the French national health insurance system.

"One-third to one-half of all arthroplasty failures occur within the first one to two years. And if you look at why they fail, the main cause is instability," Moskal said.

The main causes of arthroplasty failures in the first decade, according to Moskal, is dislocation/instability, infection and periprosthetic fractures.

The data don't lie and unfortunately the problem isn't going to get better.

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Another study, "Incidence of Projected Periprosthetic Femoral Fracture Following THA; An Analyses of International Registry Data" presented at the American Academy of Orthopaedic Surgeons annual meeting in 2014 also found that periprosthetic fractures are expected to rise by a mean 4.6% every decade (range, 4.1 to 5%).

Another study, "Epidemiology of Periprosthetic Fracture of the Femur in 32,644 primary Total Hip Arthroplasties: a 40-year Experience" published in *Journal of Joint and Bone Surgery* in 2016 also focused on periprosthetic fractures and these researchers found that intra-operative fractures occur 14 times more often with uncemented stems and that the majority of fractures are non-displaced calcar fractures treated with cerclage cables/wires. The fractures occurred more often in female patients older than 65 years of age and the majority required surgical intervention.

In addition, a 2010 study, "Uncemented and Cemented primary Total Hip Arthroplasty in the Swedish Hip Arthroplasty Register" in the *Acta Orthopaedica* reported similar data. Out of 170,413 hip arthroplasties, 17% had early postoperative fractures in uncemented stems early and 6% had late fractures in cemented stems.

The bottom line, said Moskal, is that periprosthetic fractures remain an unsolved problem. The incidence of such fractures is increasing because of the increasing number of THAs, the increasing use of cementless femoral stems and the ever aging patient population with attendant poor bone quality.

Unfortunately, operative treatment of acute fracture has a 61% complication rate, a 5% to 10% infection rate and a 23% secondary re-operation rate. Revisions are more complex because of a fresh wound and recent surgery, and therefore, many of these periprosthetic femoral fractures that occur within the first year also lead to increased patient mortality and decreased mobility.

In "Mid-Term Results of 121 Periprosthetic Femoral Fractures: Increased Failure and Mortality Within But Not After One Postoperative Year" published in the *Journal of Arthroplasty* in 2015, the data showed a one-year mortality rate of 13.2% and a re-revision rate of 16.5% when in first year.

Another study, "Adequate surgical treatment of periprosthetic femoral fractures following hip arthroplasty does not correlate with functional outcome and quality of life," published in *International Orthopaedics* in

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2015 emphasized that many of these patients do not recover preoperative ambulatory status.

Moskal, said, "Within three years of periprosthetic fracture, over 50% of patients have died and in the U.S. we are still putting in 93% of cementless stems."

According to Moskal, all national registries show an increasing use of uncemented THA worldwide. He said, "To me, it is a 'paradox'. Cemented THA has the lowest revision rate in patients older than 65 years and older than 75 years group."

"We know what we are doing is not sustainable. The high prevalence of total joint replacement creates a need to effectively manage the long-term health-care requirements and reduce the burden of subsequent complications and re-operations," he said.

"I don't believe data killed cemented THA. The increasing use of uncemented THA is not supported by registry data. This trend is in conflict with all registry data and outcomes studies. What I believe killed cemented THA in North America or worldwide is just like for me, the desire to be faster and to do more total joints."

He said that surgeons have to remember that this desire or need for speed is associated with increase revision rate and periprosthetic fractures.

Meet Dr. Moskal at the Upcoming Direct Anterior Approach Hip Course

Moskal's presentation, "Revisiting Cement for THA" was originally presented at the International Congress for Joint Reconstruction's 6th Annual Direct Anterior Approach Hip Course in 2017.

His presentation on cemented THA is also on the agenda for the 7th Annual Direct Anterior Approach Hip Course which will be held September 27-29, 2018 in Houston, Texas.

The conference is designed for orthopedic surgeons and allied health professionals looking to learn the latest in orthopedic technology and optimum patient care when using the direct anterior approach to hip arthroplasty.

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