

Cementless cup device developed for hip replacements shows durability after more than 20 years

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When a first hip replacement fails, patients may be concerned that their options for a durable hip replacement are limited and that the prognosis is poor. However, a research study to be published in the February issue of the *Journal of Bone and Joint Surgery* suggests that this may not be the case.

Researchers from Rush University Medical Center examined their results using one of the first cementless metal cup designs and found that fixation of the implant to bone is extremely durable even twenty years after repeat or "revision" hip replacement. The implant utilized, the Harris-Galante-1 acetabular metal shell, which is designed to allow a patient's bone to grow into the implant, remained fixed in place in 95 percent of hip revision cases at a minimum follow-up of 20 years.

The implant and its bone in-growth surface were originally developed in conjunction with Dr. Jorge Galante, an orthopedic surgeon at Rush University Medical Center and one of the present study's investigators.

The cup's porous surface allows bone and tissue to grow into the device to keep the hip implant in place. Earlier generation implants relied on the use of bone cement to secure the implant to the patient's pelvis and were associated with a higher rate of failure, particularly when used in patients who had previously had a hip implant that had failed.

"The study's results indicate that even the first generation of this device has excellent clinical results and durability," said Dr. Craig Della Valle, orthopedic surgeon at Rush and study investigator. "Even after 20 years, there is low rate of failure in terms of fixation."

Researchers previously reported the results of the use of the Harris-Galante-1 cementless acetabular shell for total hip revision procedures in 138 hips at a minimum of three, seven, and fifteen years postoperatively. The current report presents the long-term outcomes of this group at a follow-up of 20 years.

Of the original cohort of 138 hips, researchers were able to follow 73 patients who were still living (77 hips) for 20 years or more. Of the 77 hips, 37 had both clinical and radiographic evaluation, 20 had a clinical evaluation via telephone questionnaire and 21 underwent a repeat revision of the acetabular metal shell.

Twenty of the 21 cementless cups were found to be well fixed at the time of repeat revision and only one had become loose. During the entire study period, four cups were identified radiographically as being loose. For the entire cohort of 138 hips, the 20-year survivorship of the acetabular component was 95 percent.

While the long-term fixation of the device performed very well, the study did find an increased rate of repeat surgery for wear-related complications compared to the 15-year report. Ten patients, or 18 percent, had a complication related to wear of the bearing surface as opposed to 3 percent at 15 years.

"Although we have seen more complications related to wear as we have continued to follow these patients, our studies have taught us valuable lessons regarding failure mechanisms and how to avoid them," said Della Valle.

Despite the increasing prevalence of wear-related problems, the main modes of failure were infection and recurrent dislocations. The study authors recommend the use of larger diameter femoral heads and more wear-resistant bearings to decrease the risks of these complications.

"We can continue to make vast improvements in the quality of bearing and stability in the next generation of devices used in total hip replacements with the information we have gathered from this study," said Galante. "More and more patients are living longer and we must continue to further develop sustainable devices that will give patients a better quality of life."

Source: Rush University Medical Center

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