

Re-examining the Safety Issues of Ceramic-on-Ceramic Bearing Surface

Javad Parvizi, MD

In this month's E-publishing section, we will read more interesting and clinically pertinent articles, including an article by Tateiwa and colleagues on "Ceramic Total Hip Arthroplasty in the United States: Safety and Risk Issues Revisited."

The article, by a group of internationally recognized investigators, attempts, and accomplishes, a summary of the safety of alumina ceramic-on-ceramic bearing surface for use in THA. The main emphasis of the article is to highlight the findings of reports in the United States regarding the safety of the ceramic-on-ceramic bearing surface in general and the risk of fracture in particular.

That the article is well written and elegantly organized is not to be disputed. That the article presents the findings of various publications in an unbiased fashion is also not to be doubted. The authors nicely convince the reader that the ceramic-on-ceramic bearing surface is an important part of the armamentarium at the disposal of orthopedic surgeons who surgically treat arthritis of the hip in the young, and hence it is here to stay. I hope the authors will forgive me if I present the argument from a different and less "pro-ceramic" perspective.

First, the authors are, in my opinion, a little unfair and somewhat dramatic in their view on the conventional polyethylene and its new sister, the highly cross-linked polyethylene. I quote the authors: "In the past, however, clinical experience with 'new and improved' polyethylenes has seldom been exemplary, and current clinical experience is but a blip on the radar screen. It is also likely that the adverse conditions in the hips of our high-activity patients will severely challenge even the newest cross-linked polyethylene cups." We all know conventional polyethylene needed improvement. It did, however, serve hundreds of thousands of young patients very well without having any of the "problems" of the modern-day ceramic. The highly cross-linked polyethylene goes further in helping all patients, including the young ones. The "blips on the radar" are adding up as more investigators report their favorable experience with the highly cross-linked polyethylene.

Dr. Parvizi is Associate Professor of Orthopedic Surgery, Rothman Institute of Orthopedics, Thomas Jefferson University, Philadelphia, Pennsylvania.

Am J Orthop. 2008;37(2):E17. Copyright, Quarant HealthCom Inc., 2008. All rights reserved.

I have another bone to pick with the authors. What happened to the other problems and "safety hazards" of ceramic-on-ceramic? The authors make no mention of the recent and not so infrequent problem with squeaking! Although some may brush the latter aside as mere "noise," patients experiencing the problem see it otherwise! In fact, some of these patients are so disheartened by the problem that they heed the call of lawyers to go after the industry for "mis-manufacturing" these components. The problem is not so infrequent. According to a questionnaire survey by Dr. Ranawat, up to 4% of patients reported squeaking of ceramic-on-ceramic hips. Our center, the Rothman Institute, has detected a 2% incidence of squeaking with the modern generation of ceramic-on-ceramic bearing surfaces. What is most disturbing is that the etiology of this noise-generating problem remains elusive.

Although the quoted figures for fracture of modern design ceramic heads are based on the available literature and are correct, some surgeons may feel that they are an underestimation. I am sure the authors have, since the submission of their paper, seen the most recent article from Korea that reports a 1.4% incidence of fracture of femoral heads made of third-generation ceramic.

So, as a surgeon who believes in the incredible marvel of ceramic-on-ceramic bearing surface in substantially reducing wear, I merely want to say that ceramic-on-ceramic is not without its problems either. Depending on one's viewpoint, one bearing surface may be better than another. One thing that remains certain is that the perfect bearing surface is still the articular cartilage. Regardless of how hard we try, we will never be able to emulate the Almighty. ■