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CORR Insights®: Systemic Review of Literature of Cemented Femoral Components: What Is the Durability at Minimum 20 Years Followup?

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Where Are We Now?

Total hip arthroplasty is one of the most successful operations in the field of orthopaedic surgery. In fact, Lermonth et al. [4] called THA “the operation of the century” in 2007. Of course, that statement is still up for debate. What cannot be questioned is that the life expectancy of our patient population is getting higher. Because of this, the survival analysis of

cemented stems beyond 20 years followup is very important. Cemented stems have shown good long-term results with low revision rates at 15- and 20-year followup. However, the survival of cemented stems is influenced by several femoral-stem characteristics and operative factors including stem geometry, material properties, surface roughness, cementing technique, cement mantle thickness and stem position [1, 6].

The current study by Bedard and colleagues addressed the results of cemented stems with a followup of more than 20 years. All relevant articles in the literature with followups of more than 20 years were analyzed, leading to 4343 cemented polished stems and 360 matte stems achieving this minimum followup. According to the results of this analysis, stems with a rough surface finish did not perform as well as polished stems. However, this study included only two different series of matte stems.

This CORR Insights® is a commentary on the article “Systemic Review of Literature of Cemented Femoral Components: What Is the Durability at Minimum 20 Years Followup?” by Bedard and colleagues available at: DOI: 10.1007/s11999-014-3876-3.

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Where Do We Need To Go?

Although studies [2, 7, 8] support the idea that increased surface roughness in certain stem designs such as the Müller and the Exeter stems leads to higher loosening rates, the more-general question of which surface finish is best (rough, matte, or polished) cannot be considered answered for all cemented stems. Indeed, the complex interplay of confounding factors like surface roughness, stem geometry, and cement mantle geometry and quality

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(homogeneous or inhomogeneous) should keep us from generalizing what we know about a few stem designs compared with all others. It may be that surface roughness has a higher influence on stem survival for straight Müller-type stems with inhomogeneous cement mantle thicknesses than it does on straight Exeter-type stems or anatomical stems with more homogeneous cement mantles. This hypothesis may be supported by results from the Swedish Hip Arthroplasty Register [5], which indicated better results for the anatomical cemented Lubinus SPII stem with rough surface compared to the Müller stem with rough surface and the Charnley stem with a polished surface. The Norwegian Arthroplasty Register showed similar survival rates beyond 10 years for the matte anatomical Lubinus SPII stem and the polished Charnley stem [3]. Additionally, the inhomogeneous cement mantle of Müller-type stems may result in higher revision rates compared to Exeter- and Lubinus-type stems with homogenous cement mantles [5].

How Do We Get There?

We will need to get more-specific data from available sources. Registries, as they start to capture more data from imaging studies, may allow us to compare stems of similar design but different surface finishes, and perhaps even to perform subanalyses based on the quality of the cement mantle.

The differences in survivorship between these selected groups, even in shorter followup periods, will be even more evident in long-term followup studies. If there are no differences in the survival curves at 10 and 15 years, additional studies with longer followup would be helpful. Studies with longer followup could potentially discover the importance of surface roughness for each specific design and cement mantle of cemented stems.

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