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CORR Insights

# *CORR* Insights®: Increased Risk of Periprosthetic Femur Fractures Associated With a Unique Cementless Stem Design

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## Where Are We Now?

Uncemented THA is gaining popularity and has overtaken cemented THA worldwide. Uncemented THA is appealing because the majority of cases are performed with ease and without complication. However, periprosthetic fractures can occur around the femur. A periprosthetic fractures is much more likely to occur with stems that have "aggressive" proximal morphology. Watts and colleagues use an institutional database to evaluate the survivorship free of periprosthetic fractures of various stems, and observe that THA performed using the Proxi-Lock (PL) stem had a higher incidence of periprosthetic fractures.

## Where Do We Need To Go?

It is important to note that there is a wide variation in the morphology of native femurs. Although proximally coated tapered femoral stems appear to perform well in the majority of patients, tapered stems may not be right for every patient or every femur. This could explain the relatively high frequency, as high as 10%, of aseptic loosening of femoral stems that we see in the United States. Emerging evidence suggests that race, gender, age, and other variables affect the morphology of proximal femur. This implies that different geometry of femoral component may be needed to allow better "fit" for the prosthesis that is necessary to make it most likely that a stem will osseointegrate. The PL stem, and other fit and fill stems, were introduced to address this issue. It is not surprising that a stem with "bulkier" proximal geometry is more likely to result in fractures compared to thin profile femoral stems. What is surprising, however, is the fact that many of the periprosthetic femoral fractures Watts and colleagues examined occurred later rather than during surgery. One can only speculate the reasons for that finding. One potential explanation may be that the PL stem was used in patients with poor bone stock. The demographics of the patients receiving PL stem was different compared to the non-PL group. Although the authors have dismissed this difference as clinically insignificant, one needs to know

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the indications for the use of the stem in their institution. The fit and fill stems are usually utilized in patients with poor bone stock (at least at the metaphysis) or in those with a mismatch between the metaphysis and the diaphysis. If the PL stem was used in those circumstances more often, which would potentially explain the difference in demographics, then it is not surprising that a higher incidence of periprosthetic fracture is encountered in the PL group.

## How Do We Get There?

We need to characterize the performance of new implants and detect problems earlier, before wide adoption of new devices. The joint registries across the globe were organized to do just that. Because of the lack of a joint registry in the US (at least for now), we have relied on institutional databases to provide us with the performance report of various implants. The current study is one such report.

However, in order to implicate an implant as the culprit, it is critical that the data contain all the elements necessary to reach valid conclusions. The current study examined some of the variables that may influence the incidence of periprosthetic fractures after THA, but failed to examine many others such as the experience of the surgeon using the stem, the surgical approach and perhaps others. The most critical shortcoming of the study was its failure to evaluate radiographs and classify bone stock in patients. Future studies should include this important aspect of outcome evaluation.

Moving forward, and with the presented data by the authors, researchers need to closely examine the PL stem and other stems that may have poor track records. The performance of the prostheses that are being "watched" by registries and high-volume institutions will raise early alarms and prevent potential harm to patients.