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Letters to the Editor

Comment on article "Cement-in-Cement Revision for Selected Vancouver Type B1 Femoral Periprosthetic Fractures: A Biomechanical Analysis"

To the Editor:

I read with interest the recent article "Cement-in-Cement Revision for Selected Vancouver Type B1 Femoral Periprosthetic Fractures: A Biomechanical Analysis" by Brew et al [1] (volume 28 [number 3]).

The authors conducted a biomechanical study of the cement-in-cement technique for treatment of periprosthetic hip fractures. As the incidence of periprosthetic fractures continues to increase, the optimal treatment of these difficult fractures is an important area for research. I, however, disagree with the classification of the fracture created for this biomechanical study being classified as a Vancouver B1. As referenced in the manuscript's introduction, Vancouver B1 fractures are fractures around the stem in which the stem remains stable. Additionally, the authors suggest that "traditional techniques for treatment of Type B1 fractures involve removal of all the original cement mantle, fixation of the fracture using circlage wires with supplemental fixation with a plate or strut graft if needed, followed by insertion of a long femoral cemented or uncemented stem."

The fracture created in this study appears to be a Vancouver B2 fracture, defined as a fracture around the stem in which "the stem is loose," as the fracture depicted in the manuscript clearly shows a large disruption of the cement mantle which leads to loss of clinical stability of the stem. Additionally, the authors' description of the traditional treatment of Type B1 fractures appears to describe the traditional treatment of a Vancouver B2 fracture in which the stem is loose. Vancouver B1 fractures can often be treated with traditional fracture fixation techniques without revision of the stem.

Nevertheless, this remains an interesting method to treat a small subset of Vancouver B2 fractures. However, it should be emphasized that this method is likely only appropriate for a small subset of fractures in which the vast majority of the cement mantle remains bonded to the bone and in which there is minimal comminution, which allows for anatomic reduction of the fracture fragments with cerclage wires alone.

I believe that this is likely a useful technique for fractures meeting these strict treatment criteria, however, as the Vancouver Classification is the most commonly utilized periprosthetic fracture classification in the literature, it is important to have consistent application of this classification to avoid confusion in the literature as well as for the treating surgeon.

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The Conflict of Interest statement associated with this article can be found at http://dx.doi.org/10.1016/j.arth.2013.05.022.

Reference

1. Brew CJ, Wilson LJ, Whitehouse SL, et al. Cement-in-cement Revision for selected Vancouver Type B1 femoral periprosthetic fractures: a biomechanical analysis. J Arthroplasty 2013;28:521.

Author Reply: Cement-In-Cement Revision for Selected Vancouver Type B1 Femoral Periprosthetic Fractures: A Biomechanical Analysis

In Reply:

We thank you for the opportunity to reply to the comments on our paper entitled "Cement-in-cement revision for selected Vancouver type B1 femoral periprosthetic fractures, a biomechanical analysis, by Brew et al" [1]. We entirely agree with the sentiments expressed in the letter questioning the classification we chose. There was much debate amongst all authors of our paper, the reviewers and the editors as to the correct way of classifying the fractures we described, and in fact we originally classified them as Vancouver B2.

The original Vancouver classification was described by Masri et al, in 2004 [2]. In the paper they describe a fracture occurring around a well fixed (B1) or loose stem (B2). However, reviewing studies using this classification system, there is quite a large variation in what is considered B1 and B2 fractures. In the work of Dumont et al [3], specifically the examples given, would not fit the parameters given by Masri. Another study by Lever et al [4] classifies B1 fractures as transverse distal tip fractures which could be classified as type C fractures.

A well fixed stem can be treated with open reduction and internal fixation. A loose stem requires more extensive revision. The issue arises in that for polished tapered cemented stems, such as the Exeter stem described in our paper, the stem may be well fixed prior to fracture but once the fracture occurs the stem becomes unstable within the cement construct even though the bone cement interfaces remains well fixed. It is this type of fracture we are describing and having difficulty categorising within the Vancouver classification.

With a cemented taper slip stem, the stem subsides at the implant cement interface. It is the integrity of the bone cement interface that is important. We believe if an implant is well fixed and functioning prior to fracture, even if it becomes unstable following fracture it is still suitable to be treated with the cement-in-cement technique we described. If a stem is loose prior to fracture this technique is not appropriate. There is hence great difficulty in correctly classifying the fractures we see around polished tapered stems using the original Vancouver classification. It may be possible that the classification could be modified to include a subgroup of cemented stems which are well fixed and well functioning prior to fracture but then the construct becomes loose following fracture, due to the inherent mechanical properties of the design. This is the subgroup we are describing in this study.

The Conflict of Interest statement associated with this article can be found at http://dx.doi.org/10.1016/j.arth.2013.05.021.