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Letter to the editor

Letter to the Editor on "Disassociation of a Cold-Welded Bimodular Titanium Femoral Stem by Intraoperative Ice Cooling"

I read with interest the article entitled "Disassociation of a cold-welded bimodular titanium femoral stem by intraoperative ice cooling" by Frandsen et al. [1], and I want to congratulate the authors on a report that deals with the challenging problems of stem, neck, and head modularity in contemporary total hip arthroplasty.

Their unique technical solution should be remembered by all revision surgeons, and I agree with their logical approach to the difficult decision-making of when to remove a well-positioned, well-fixed, bimodular titanium femoral stem. I agree that current information about the Zimmer M/L taper prosthesis with Kinectiv Technology (Zimmer Biomet, Warsaw, IN) makes it a candidate for partial revision because (1) the neck is constructed of titanium (Ti) alloy, and although a Ti-Ti interface with the stem may cold-weld [1] or even corrode [2,3], it will likely not lead to an adverse local tissue reaction as there is no cobalt (Co) alloy involved; (2) the design length of this particular modular titanium neck is relatively short and therefore unlikely to break, distinct from longer Ti modular necks that are apt to fracture [4,5]; and (3) usage of a ceramic femoral head at the obverse taper on the neck should diminish corrosion and metal loss [6], and again, without a Co-alloy component in the mix, minimize the risk of adverse local tissue reactions. The decision to revise such a stem is complex [7], but the authors make a very logical argument for revising only the head and neck in their patient's case.

I would also like to add one observation to the authors' case report that I think is very important. The case history and prerevision imaging (Figs. 1b and 3b, specifically) show conclusively that the patient had a long-standing gross trunnion failure (GTF) of his previous total hip replacement unrelated to his motorcycle crash. As Morlock et al have demonstrated, this is a very specific pattern (so-called "bird beak") seen with end-stage mechanically assisted crevice corrosion (MACC) and is more commonly observed with less-stiff-material trunnions and smaller tapers [8].

Although GTF due to MACC has been noted rarely across many total hip arthroplasty designs and manufacturers [9], it is particularly common in a recalled Co-alloy femoral head and proprietary Ti-alloy trunnion (TMZF, Stryker, Mahwah, NJ) [8,10]. To my knowledge, the present case report by Frandsen et al. is the first such case noted in a Zimmer M/L taper prosthesis with Kinectiv Technology (Zimmer Biomet, Warsaw, IN).

It is important to point out that the Zimmer M/L taper prosthesis (Zimmer Biomet, Warsaw, IN) has recently been described as having high revision for corrosion in a long-term analysis of the Australian National Joint Replacement Registry; in fact, it has had a higher failure rate than the discontinued Accolade 1 Stem (Stryker, Mahwah, NJ) [11]. Although that report excluded bimodular neck M/L taper stems with Kinectiv Technology (Zimmer Biomet, Warsaw, IN), the proximal trunnion design and composition, as well as the Co-alloy femoral heads and countersurfaces used, are presumably identical. Because there are multiple prior reports showing cases and case series of failures of this bimodular version of the M/L taper stem (Zimmer Biomet, Warsaw, IN) secondary to MACC [2,12-14], I think it is critical to monitor all patients with M/L taper stems (Zimmer Biomet, Warsaw, IN) carefully for evidence of taper corrosion failure.

In summary, thank you for an enlightening case report that not only expands our understanding of failure mechanisms secondary to MACC but also demonstrates a logical, creative method to treat such a failure in this specific patient. I would point out that the case is also the very first report of GTF in this implant, and this failure once again underscores the need to carefully monitor patients with M/L taper stems (Zimmer Biomet, Warsaw, IN) for evidence of taper corrosion failure.

Conflicts of interest

B.J. McGrory receives royalties from Smith & Nephew, Inc., and Innomed, Inc.; is a paid consultant for Smith & Nephew, Inc.; and is a member of medical/orthopaedic publications editorial/governing board of AAHKS.

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