



Corrosion at the Head-Neck Junction: Why is the Happening Now?

Joshua J. Jacobs, MD, H. John Cooper, MD,
Young-Min Kwon, MD, Adolph V. Lombardi, MD

Corrosion at metal/metal modular interfaces in total hip arthroplasty was first described in the early 1990's [1], and the susceptibility of modular tapers to mechanically assisted crevice corrosion (MACC), a combination of fretting and crevice corrosion, was subsequently introduced [2]. Since that time, there have been numerous reports of corrosion at this taper interface, documented primarily in retrieval studies or in rare cases of catastrophic failure. It has been known that fretting corrosion at the modular taper may produce soluble and particulate debris that can migrate locally or systemically [3], and more recently there are increasing reports that this process can cause clinically relevant adverse local tissue reactions [4,5]. Based on the characteristics of this tissue reaction and the presence of elevated serum metal levels, this process appears quite similar to adverse local tissue reactions secondary to metal on metal bearing surfaces [6]. This symposium will address factors that contribute to this phenomenon, prevention strategies and tips for diagnosis and management.

1. *Corrosion at the Interface of Cobalt-Alloy Heads on Titanium-Alloy Stems*. Collier, J.P., V.A. Surprenant, R.E. Jensen, and M.B. Mayor, *Clinical Orthopaedics and Related Research*, 1991(271): p. 305-312.
2. *In-Vivo Corrosion of Modular Hip-Prosthesis Components in Mixed and Similar Metal Combinations - the Effect of Crevice, Stress, Motion, and Alloy Coupling*. Gilbert, J.L., C.A. Buckley, and J.J. Jacobs, *Journal of Biomedical Materials Research*, 1993. 27(12): p. 1533-1544.
3. *Migration of Corrosion Products from Modular Hip Prostheses - Particle Microanalysis and Histopathological Findings*. Urban, R.M., J.J. Jacobs, J.L. Gilbert, and J.O. Galante, *Journal of Bone and Joint Surgery-American Volume*, 1994. 76A(9): p. 1345-1359.
4. *Corrosion at the Head-Neck Taper as a Cause for Adverse Local Tissue Reactions After Total Hip Arthroplasty*. John Cooper, H., C.J. Della Valle, R.A. Berger, M. Tetreault, W.G. Paprosky, S.M. Sporer, and J.J. Jacobs, *The Journal of Bone & Joint Surgery*, 2012. 94(18): p. 1655-1661.
5. *Adverse Local Tissue Reactions Arising from Corrosion at the Neck-Body Junction in a Dual Taper Stem with a CoCr Modular Neck*. Cooper, H.J., R.M. Urban, R.L. Wixson, R.M. Meneghini, and J.J. Jacobs, *The Journal of Bone & Joint Surgery*, 2013. 95:865-872.
6. *Early failure of metal-on-metal bearings in hip resurfacing and large-diameter total hip replacement A CONSEQUENCE OF EXCESS WEAR*. Langton, D.J., S.S. Jameson, T.J. Joyce, N.J. Hallab, S. Natu, and A.V.F. Nargol, *Journal of Bone and Joint Surgery-British Volume*, 2010. 92B(1): p. 38-46