



Letter to the Editor

Letter to the Editor on “Total Hip Arthroplasty in the Ultrayoung”

We read with great interest the article “Total Hip Arthroplasty in the Ultrayoung” by Mazur et al [1], a study highlighting outcomes of total hip arthroplasty (THA) in patients of age 30 years or younger. Within this cohort of 35 patients, the majority were women and had metal-on-polyethylene (MoP) articulations [1]. The authors concluded that, when indicated, contemporary THA was appropriate in this age group. We would like to add 1 proviso to the investigator’s observations based on clinical experiences at our institution.

We reported from a subset of surgeries at Maine Medical Center that 22% of patients with a THA and MoP bearing had abnormal serum cobalt (Co) of greater than 1 ppb [2]. Subsequently, we found 127 of 8665 (1.5%) patients undergoing primary THA in the past 10 years were women of childbearing age. While THA in pregnancy warrants specific considerations [3], we would like to emphasize consideration of the hip implant itself. Co alloy femoral heads specifically carry the risk of transfer of ions from trunnion/bore corrosion and fretting across the placenta [4–6]. Effects of exposure to these metals are underinvestigated and may be detrimental to a developing fetus [7–9]. We feel strongly that until trunnion corrosion and fretting are better understood and eliminated, non-Co femoral heads should be used in THAs, especially in women of childbearing age. This bears pointing out, as usage of MoP bearings still accounts for approximately 15%–30% of THA [10–12]. We recommend use of ceramic or oxidized zirconium femoral heads.

A known complication of THA is mechanically assisted crevice corrosion, corrosion and fretting at the taper junction [13] that releases Co and chromium (Cr) ions and debris, which can cause adverse local tissue reaction in metal-on-metal (MoM) [14,15] and MoP bearings. [16–18] Elevated systemic Co and Cr levels are found even when adverse local tissue reaction is not present. [16,17]

Studies investigating Co and Cr levels in pregnant women who received a MoM THA find that maternal blood contains much higher levels of these trace elements than controls without THA [4,5], and this variation is tempered when evaluating placental cord blood, supporting the hypothesis that the placenta exerts a modulatory effect on metal transfer [4,5]. This is reassuring yet does not negate the central finding that MoM THA is associated with elevated cord blood ion levels [4,5]. There is reasonable expectation based on biomechanical processes and mechanically assisted crevice corrosion incidence that cross-placenta ion transfer may be present in patients with MoP bearings as well.

A limited number of case reports indicate infants born to mothers with elevated serum Co and Cr levels remained asymptomatic despite notably increased ion levels [6,19–21]. As far as

we know, there are no published reports of teratogenic effects from increased placental Co and/or Cr in THA. We note this as an understudied area with a need for continued vigilance for possible adverse effects of elevated systemic metal levels in arthroplasty patients with the potential to conceive. Physicians and patients of childbearing potential should be aware of this when considering the use of MoM- and MoP-bearing implants in the ultrayoung.

Conflicts of interest

The authors declare there are no conflicts of interest.

For full disclosure statements refer to <https://doi.org/10.1016/j.artd.2023.101279>.

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DOI of original article: <https://doi.org/10.1016/j.artd.2023.101181>.

<https://doi.org/10.1016/j.artd.2023.101279>

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11 October 2023
 Available online 23 January 2024