Letter to the Editor: Failure of Screw/Shell Interface in Trident II Acetabular System in Total Hip Arthroplasty

van der Lelij, Thies J.N.; Marang-van de Mheen, Perla J.; Kaptein, Bart L.; Nelissen, Rob G.H.H.

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We have read the paper "Failure of Screw/Shell Interface in Trident II Acetabular System in Total Hip Arthroplasty" by Ulrich et al. [1] with great interest. Critical postmarket evaluation of new orthopaedic implants is important, and reporting of in vivo cases of implant failure helps to raise awareness of potential complications and implant design flaws.

However, we would like to draw attention to the fact that the Trident II acetabular system (Stryker, USA) includes different subtypes, referred to as Trident II Tritanium and Trident II hydroxyapatite (HA) shells. The Trident II Tritanium has solidback, multihole, and clusterhole shells, and the Trident II HA clusterhole shells are offered as hemispherical or peripheral self-locking shell [2]. Where the Trident II Tritanium shells are 3D printed, the Trident II HA shells are manufactured by a different process of forging and machine finishing [3]. We recently performed a radiostereometric analysis study to assess the early migration pattern of the Trident II clusterhole HA acetabular shell. In our study, we explicitly caution against extrapolating results to other shells of the Trident II acetabular system, as small changes to an implant design or the manufacturing process may affect the implants' stability and clinical performance [3].

The authors report a case series of 2 patients with screw/shell interface failure in total hip arthroplasty and clearly describe that both patients received a Trident II clusterhole HA acetabular shell. These Trident II HA shells differ from previous Trident HA shells in having a plasma-sprayed rather than an arc-deposited commercially pure titanium surface; both are covered by PureFix HA coating [2,4]. In the discussion section of that paper, the authors imply that all Trident II shells are 3D printed, which is incorrect. Furthermore, the additive manufacturing process is discussed as a possible explanation for the observed screw/shell interface failure, as the latter fabrication process allows designs to have a thinner shell and a deeper recessed screw position, but the Trident II HA shells are produced by forging and machine finishing.

Recently, studies have drawn attention to the camouflage of true outcomes of total knee arthroplasty because of multiple variants and options within a knee brand portfolio [5,6]. We want to underline that one should also be aware of such a camouflage effect within total hip arthroplasty if only the implant brand names are used in comparisons, like in the Trident II example in this case. Not recognizing differences between subtypes within the same acetabular system may lead to an incorrect hypothesis of underlying failure mechanisms.

We commend Ulrich et al. [1] for reporting the failure of the acetabular screw/shell interface in two of their patients, as early identification of in vivo failure of new implants can guide further research. We hope that this letter contributes to improving awareness about differences between implant subtypes within the same implant brand portfolio.

Conflicts of interest

B. Kaptein is a board member of the International Radiostereometry Society. All other authors declare no potential conflicts of interest.

For full disclosure statements refer to https://doi.org/10.1016/j.artd.2024.101358.

CRediT authorship contribution statement

Thies J.N. van der Lelij: Conceptualization, Writing – original draft. **Perla J. Marang-van de Mheen:** Conceptualization, Writing – review & editing. **Bart L. Kaptein:** Conceptualization, Writing – review & editing. **Rob G.H.H. Nelissen:** Conceptualization, Writing – review & editing.

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Thies J.N. van der Lelij, MD*
Department of Orthopaedics
Leiden University Medical Center
Leiden, Zuid-Holland, The Netherlands

Perla J. Marang-van de Mheen, PhD
Department of Orthopaedics
Leiden University Medical Center
Leiden, Zuid-Holland, The Netherlands

Safety & Security Science and Centre for Safety in Healthcare
Delft University of Technology
Delft, Zuid-Holland, The Netherlands

Bart L. Kaptein, PhD
Department of Orthopaedics
Leiden University Medical Center
Leiden, Zuid-Holland, The Netherlands

Rob G.H.H. Nelissen, MD, PhD
Department of Orthopaedics
Leiden University Medical Center
Leiden, Zuid-Holland, The Netherlands

* Corresponding author. Department of Orthopaedics, Leiden University Medical Center, Albinusdreef 2, P.O. Box 9600, Leiden 2333 ZA, The Netherlands. Tel.: +31 0 71 5263161.
E-mail address: T.J.N.van_der_lelij@lumc.nl (T.J.N. van der Lelij).

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