Reliability of results of MARS-MRI diagnostics for low-grade periprosthetic shoulder infections depends on the quality of the reference standard Commentary on an article by Jan Fritz et al.: “Diagnostic Performance of Advanced Metal Artifact Reduction MRI for Periprosthetic Shoulder Infection”

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Fritz et al. (1) researched MARS-MRI findings for periprosthetic shoulder infection (PSI) and found an exceptionally high probability of > 99%. However, incorrect assumptions were made resulting in unreliable conclusions. Most PSIs are low-grade shoulder infections caused by Cutibacterium acnes. The absence of characteristics of high-grade infections, such as wound disturbances, fever, or increased inflammatory blood levels, make diagnosis difficult (2,3). Fritz’s study (1) used the ICM 2018 (4) criteria as a reference for PSI. However, the value of the combined criteria has not been investigated in prospective studies. Therefore, it cannot be used for research purposes (5).

Of the 67 non-infected participants, only 20 were operated. Missing items (e.g., samples) make this group less comparable to the infected group. For eight participants who were operated on, the surgical indication was “intractable pain and stiffness”, which are typical characteristics of low-grade PSI (6,7). Four non-infected patients had positive cultures, which might indicate an infection. Furthermore, patients were considered non-infected if they had “no clinical or radiographic signs of an infection at 1-year follow-up”, but such signs are only present in a minority of PSIs (6,8).

No standardized protocol for tissue samples for culture was used with different numbers in the study groups. Moreover, “obtaining five surgical culture specimens was not always possible because of a lack of tissue from some interfaces” or “no overt signs of infection” makes these results biased. Furthermore, the authors did not report from how many patients culture specimens were taken or the threshold of positivity for PSI. All the above-mentioned shortcomings cannot be considered good clinical practice.

An aspect that was not considered is the possibility of other causes of inflammation, like active inflammatory joint disease (5). In such cases, the MARS-MRI findings should be interpreted with caution.

In our opinion, the insufficient identification of low-grade PSI makes the MARS-MRI study results unreliable. Nevertheless, future studies using a well-standardized reference for PSI are desirable and will hopefully provide an
alternative to current invasive diagnostics.

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References


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