

Prospective comparison of whole-body ^{18}F -FDG PET/CT and MRI of the spine in the diagnosis of haematogenous spondylodiscitis: response to comments by Soussan

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Dear Sir,

Following the recent publication of our study on whole-body ^{18}F -FDG PET/CT and MRI of the spine in the diagnosis of haematogenous spondylodiscitis [1], we would like to reply to the comments by Soussan [2].

Dr. Soussan questions the low specificity of MRI regarding the MRI criteria for infection described in the “Materials and methods” section of the article. Early diagnosis of spondylodiscitis is a major challenge; for example, percutaneous disc biopsy shows a low yield for identifying the microorganism. This is reflected in the findings of a study by Cebrián Parra et al. in which only 28 of 56 percutaneous disc biopsies in patients with infectious discitis were positive [3]. MRI imaging has been demonstrated to be the most sensitive imaging method for evaluating spondylodiscitis providing excellent anatomical information without the use of ionizing radiation [4]. This technique may also help differentiate infectious processes from other disorders such as degenerative disorders, extradural neoplastic processes and rheumatoid diseases. However, there are situations where MRI can be less helpful for diagnosing infection because of its lower specificity [5], such as in the presence of fractures (traumatic or iatrogenic) and spinal implants [6] or when the suspected spondylodiscitis is associated to Modic changes or arthrodegenerative changes [7].

In most cases MRI images show the typical findings of spondylodiscitis, but there are several noninfectious

conditions that may simulate a spinal infection. Gratz et al. in a study of 16 patients found that of 12 who demonstrated spondylitis or spondylodiscitis, 6 showed equivocal findings, and they concluded that PET/CT was superior to MRI [8]. In another study, Hungenbach et al. highlighted the difficulties with MRI in contrast to PET/CT in distinguishing between initial spondylodiscitis and degenerative changes in the vertebral body endplates. Accordingly, spondyloarthropathy along with the presence of vertebral fractures were the main causes of false-positive for MRI findings in our series [9]. Moreover, Stumpe et al. have reported the utility of FDG PET for the differentiation of degenerative from infectious endplate abnormalities in the lumbar spine that were detected on MRI [10].

As is described in the “Materials and methods” section of our study, we accepted as MRI criteria of spondylodiscitis the presence of intervertebral disc involvement, disc space narrowing, epidural extension and contrast enhancement pattern. We believe perhaps Dr. Soussan has assumed that all criteria had to be present to establish the diagnosis of spondylodiscitis. This was not the case, as the diagnosis of spondylodiscitis was established by two radiologists who had to choose between two categories which were “spondylodiscitis” or “other diagnosis”, as is reflected in the section “Image interpretation” of the “Materials and methods” section. The diagnosis of spondylodiscitis by PET/CT or MRI was performed on the basis of significant FDG uptake on PET/CT and on the basis of one or more of the selected criteria previously mentioned for MRI. As is also described in the section “Image interpretation”, the diagnosis or exclusion of spondylodiscitis was established separately by two independent observers who were blinded to the results of the verification procedures. In retrospect, one limitation of the study was the low number of patients that could explain the unexpectedly low specificity of MRI (true-negative findings in only eight patients in this study), and for this reason MRI may have been underestimated.

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Regarding the supporting literature cited by Dr. Soussan, we must point out that in the study of Ledermann et al., since all patients had an infection (no patients with false-positive or true-negative findings), it was not possible to calculate specificity values for these MRI findings [11]. The study by Jevtic et al. emphasizes the high sensitivity of MRI with satisfactory values of specificity, but also recognizes the difficulties in correct differential diagnosis between spondylodiscitis and other noninfectious processes such as degenerative diseases or inflammatory changes [12].

In summary, we agree that MRI is currently the gold standard imaging technique in suspected spondylodiscitis and is recognized for its high sensitivity, a finding that we reported in the current study, where it was superior to PET/CT [1]. However, on MRI spinal infection may sometimes be difficult to differentiate from other noninfectious processes which could mimic spondylodiscitis leading to a lower specificity. Therefore, and based on the results obtained in our study, we conclude that due its high specificity together with satisfactory sensitivity, PET/CT can be considered, together with MRI, as the first-line imaging procedure in the diagnosis of spondylodiscitis, especially in those patients in whom MRI is suggestive of infection but no soft involvement is present.

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