



Not all artifacts after magnetic guided sentinel lymph node biopsy are necessarily related to superparamagnetic iron oxide nanoparticles

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We read with interest the article by Vural et al. [1]. In their paper they refer to an own case report regarding imaging artefacts after supra paramagnetic nanoparticles of iron oxide (SPIO) [2]. In Uppsala, Sweden, we have used SPIO for sentinel node detection as our routine method since 2015 [3], often injected before tumour localisation with guide-wire or MagSeed and the localisation is confirmed by a mammogram [4]. Interestingly, we have never encountered SPIO-related artifacts on follow-up mammograms, like those described by the authors. If mammography is done immediately after the injection of SPIO, fluid in the glandular tissue may be seen, but this is not SPIO specific.

However, we are familiar with the MRI artifacts and we are currently investigating the possibilities to reduce these within a prospective trial (PostMagMRI). Today, we inject SPIO deeper, close to the lesion and most SPIO is removed with the specimen at surgery. Also, MRI artefacts seem to be less prominent with lower SPIO volumes and especially if the majority of SPIO is removed with the specimen at surgery. We are also looking at how MRI artifacts decrease over time.

Regarding the reported case with the spiculated density on the 12 months follow-up mammogram (Fig. 3), it would be of value to discuss whether, site and timing of SPIO injection, and total injection volume (SPIO ± saline) may affect the artifact size, as well as whether the lesion was

biopsied to exclude the risk of recurrence and whether the pathologist could identify SPIO in the macrophages, as well as what the authors have chosen as optimal follow-up modality. On the mammogram (Fig. 3), it seems like the size of the spiculated density is quite small (app. 15 mm) and not corresponding to a volume of more than about 2 cm³ [lesion volume = $4/3\pi \times (\text{maximal lesion diameter}/2)^3$].

We can only hypothesise that an accumulation of SPIO could be related to injection into scar tissue or in a postoperative cavity from earlier surgery. However, this is not in line with our experience and we must raise the question that this finding should probably be investigated as a post-operative finding not related to SPIO or, in the worst scenario a recurrence, if SPIO presence in the tissue is not demonstrated.

Compliance with ethical standards

Conflict of interest No author has any conflict of interest.

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