Correspondence

Re: Improved diagnostic accuracy in differentiating malignant and benign lesions using single-voxel proton MRS of the breast at 3 T MRI.

A reply

Sir — We thank Dr Battal and colleagues for their interest in our article. Their comments and suggestions on this topic are appreciated.

We acknowledged that there have been recent studies investigating the effect of various gadolinium-based contrast agents on the results of proton (¹H) magnetic resonance spectroscopy (MRS) of the breast. These reports have highlighted that contrast agents comprising negatively charged (ionic) chelates, such as gadopentate dimeglumine (Magnevist; Schering, Berlin, Germany) can reduce the area of total choline compound (tCho) peak and, therefore, may lead to an underestimation of the levels of the metabolite peak in human breast tumours. It has been suggested that the reduction of tCho peak area is due to the electron–nuclear dipole interaction of Cho with the negatively charged contrast agents, which lead to shortening of relaxation times of methyl groups of the metabolite. MRI contrast agents comprising neutral (non-ionic) chelates combined with gadolinium, such as gadodiamide (Omniscan), gadoversetamide (OptiMark), and gadoteridol (ProHance), have, therefore, been recommended.

Despite this, sensitivity and specificity values of 95.2% and 93.3%, respectively, were achieved utilizing gadopentate dimeglumine in our study, using histopathological findings as the reference standard. Therefore, this implies that quantitative analysis will help set a cut-off point to differentiate benign from malignant lesions, thus quite reliably reflecting the final diagnosis.

In our study, the spectroscopic examination was performed after an average of 15–20 min after the administration of contrast medium, similar to techniques employed by previous research groups. The time interval following the dynamic contrast-enhanced sequence allowed ample time for optimal image processing and selection of accurate volume of interest (VOI) placement for spectroscopic acquisition.

Our paper focussed on identifying a simple protocol that was clinically applicable for breast MRS. We concur with the comments that the technique is not without its complexities. Regarding motion artefacts, which caused five cases to be removed from our study due to erratic spectra, new MRI applications, such as PROMO (a real-time prospective motion correction in MRI using image-based tracking, which is currently used for brain imaging) may be helpful. Future studies could investigate this protocol to see whether it is clinically applicable to breast MRS.

In conclusion, radiologists should not be discouraged by the drawbacks and limitations that they may encounter when attempting to perform functional MRI of the breast for diagnosis of breast cancer. Since its first introduction for breast imaging in the 1990s, there have been numerous advances in the knowledge pertaining to breast MRI, with current interest looking at the quantitative approach in breast MRS. Thus, with the development of improved technology, MRS of the breast is still, currently, a fairly practical and reliable non-invasive adjunct tool for improved specificity and diagnostic accuracy in breast cancer detection.

References


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