

To compare MR Spectroscopy at 3T with tumor type and grading of breast cancers

M. telesca¹, F. pediconi¹, M. luciani¹, V. casali¹, F. vasselli¹, E. miglio¹, C. catalano¹, and R. passariello¹
¹"Sapienza" university of rome, rome, italy, Italy

Purpose: To evaluate the diagnostic performance of magnetic resonance (MR) spectroscopy at 3T to detect different cancer types and prognostic factors in patients with biopsy-proven breast cancer.

Materials and Methods: Breast MR spectroscopy was performed at 3T in patients with biopsy-proven malignant lesions measuring 6 mm or larger at MR imaging. Single-voxel MR spectroscopy data were collected from a single rectangular volume of interest that encompassed the lesion. MR spectroscopy findings were defined as positive if the signal-to-noise ratio of the choline resonance peak was greater than or equal to 2 and as negative in all other cases. MR spectroscopy findings were then compared with histologic findings. Lesion size, histotype, nuclear grade, receptor status (ER, PgR), and Ki67 and HER2 expression were evaluated. **Results:** A total of 17 patients with 21 lesions were evaluated. Histologic analysis confirmed 15 IDC, 5 ILC and 1 DCIS. The median lesion size at MR imaging was 1.3 cm (range, 0.6–7 cm). A choline peak was present in 13 of 21 lesions (12 IDC and 1 ILC). Three IDC with no choline peak presented with large central area of necrosis. Thus, a choline peak was more frequently associated with IDC than with ILC, DCIS and necrosis. No statistically significant association of choline peak with receptor status (ER, PgR), Ki67 and HER2 was found, although the choline peak was always present in triple negative patients. **Conclusion:** Proton MR spectroscopy at 3T was successfully incorporated into breast MR imaging studies for lesions measuring 6 mm or larger. MR spectroscopy could be an additional tool to predict tumor aggressiveness. Results need to be validated in larger-scale studies.

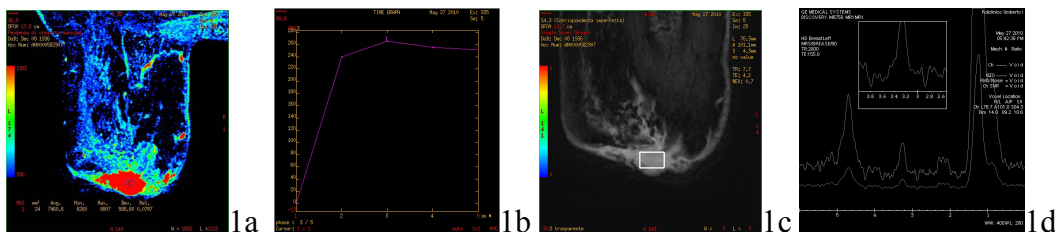


fig 1 a, b, c, d: Breast Dynamic Magnetic Resonance Imaging and Breast (breast single voxel spectroscopy-TE averaged press sequence) in a patient with proven subareolar lobular invasive carcinoma. Lesion shows irregular shape and high enhancement after contrast agent injection (1a) with a IS/T type III curve (1b). ¹H spectrum from the tumor area (voxel) (1c) displays a gross peak of choline containing compounds at 3.2 ppm (1d). receptor status for ER, PgR and Ki67 expression was respectively 70%, 50% and 10%.