Updated Recommendations for MRI of the Breast

Aktualisierte Empfehlungen zur Durchführung der MRT der Mamma

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Key words
- breast diseases
- MR imaging
- breast cancer

Abstract

The managing board of the Breast Imaging Working Group of the German Radiological Society revised the recommendations regarding technique, methods, indications, evaluation, and documentation of MR mammography from the year 2005 [1] and adapted them to the improved technical options and the latest scientific knowledge. In relation to technical imaging parameters, these recommendations describe the minimum requirements for acquiring high-quality MRI images of the breast. The recommendations are a general guide to be adjusted by the examiner as needed to suit the individual situation.

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Zusammenfassung

Der Vorstand der Arbeitsgemeinschaft Mammadiagnostik der Deutschen Röntgengesellschaft hat die Empfehlungen zur Technik, Methodik, Indikationsstellung, Auswertung und Dokumentation der MR-Mammographie aus dem Jahre 2005 [1] überarbeitet und den verbesserten technischen Möglichkeiten und den neuesten wissenschaftlichen Erkenntnissen angepasst. In Bezug auf die technischen Aufnahmeparameter beschreiben diese Empfehlungen Mindestanforderungen für die Anfertigung einer qualitativ hochwertigen MRT der Mamma. Grundsätzlich handelt es sich bei den Empfehlungen um eine generelle Orientierungshilfe, die vom Untersucher in Abhängigkeit von den individuellen Gegebenheiten im Einzelfall ggfs. angepasst werden muss.

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Bibliography
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field strength:	1.5 T or 3 T
coil:	dedicated bilateral multichannel breast coil with immobilization device
examination protocol	
▶ dynamics:	The recommended standard is an axial 3D-GE sequence (in-phase) with or without fat suppression with 1 series before and at least 3 series after contrast agent administration with a temporal resolution of the individual sequences of ≤ 2 minutes and a total examination time after contrast agent administration of at least 5 minutes. Other techniques (e. g. coronal 3 D, axial 2 D) can continue to be performed at centers with significant experience with the technique but are not generally recommended.
▶ contrast agents:	Paramagnetic Gd contrast agent, weight-adapted simple standard dose, if possible use of contrast agents with a low NSF risk or only in the case of GFR ≥ 30 ml/min/1.73 m². If possible, cubital access, preferably automated injection (injection speed 2 – 3 ml/s), subsequent injection of 20 ml NaCl.
▶ T2-weighted sequence:	Additional T2-weighted sequences prior to contrast agent application (alternatively SE, IR, or FSE/TSE sequences with or without fat suppression) can be helpful in the differential diagnosis of unclear changes and for correlation with other examination methods.
▶ spatial resolution:	On a slice plane ≤ 1 mm × 1 mm, slice thickness < 3 mm.
hormones:	Exogenous hormone therapy (e. g. hormonal contraception, hormone replacement therapy) can result in assessment limitations with reduced sensitivity and specificity in MRI. In the case of diagnostic difficulties, the examination can be repeated after discontinuation of hormone therapy. When using MRI for early detection in asymptomatic women in a high-risk situation, hormone therapy should be discontinued for at least 4 – 6 weeks prior to MRI examination.
time of examination	
▶ in premenopausal women:	Second week of cycle (excluding preoperative staging).
▶ after surgery:	Examination ideally within the first four weeks after surgery or after a wait period of at least 6 months after surgery.
▶ after radiation:	In the case of an irradiated breast, a wait period of at least 12 months after radiation should be observed if possible. However, if indicated, it can also be helpful to perform MRI within the first 12 months after radiation therapy.
postprocessing:	Subtraction images and MIP projections of dynamic sequences. An evaluation of contrast enhancement over time either by manual ROI placement or with the help of corresponding evaluation software can be helpful for better lesion characterization. In the case of manual ROI placement, the measurement should be performed in the region of the greatest contrast enhancement in a lesion. At the same time a sufficient ROI size (e. g. at least 3 pixels) should be ensured.
storage:	Digital archiving of the examination, option to store the examination on CD/DVD.
reporting:	Description and evaluation of motion artifacts and the background activity of the glandular parenchyma. Previous breast diagnostic findings should be integrated in the MRI findings to provide a cumulative evaluation with recommendations for the further course of action. Both the contrast enhancement behavior in the dynamic examination and the morphology of the lesion should be taken into consideration for the evaluation of the malignancy of a lesion.
interventions:	For the case that a suspicious lesion seen on MRI in the region of the breast cannot be seen via mammography or a targeted second-look ultrasound, it must be possible to perform MRI-supported intervention on-site or at an external center on the basis of a written cooperation agreement.