Breast MRI in clinically and mammographically occult breast cancer presenting with an axillary metastasis: a systematic review

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CRD summary
This review found that breast magnetic resonance imaging can result in additional detection of otherwise occult lesions in occult breast cancer, but that lesions should be histologically confirmed. The small size and methodological limitations of the primary studies together with limitations in the review process mean these conclusions should be interpreted with caution.

Authors' objectives
To determine the value and additional considerations of using breast magnetic resonance imaging (MRI) in occult breast cancer.

Searching
PubMed, EMBASE, CINAHL and The Cochrane Library were searched to 2009. Search terms were reported. The review was restricted to studies in English, German, Spanish, French and Dutch. References of relevant articles were screened.

Study selection
Studies of at least 10 patients that assessed MRI in patients with occult breast cancer were eligible for inclusion. Occult breast cancer was defined as isolated metastatic axillary lymphadenopathy with no palpable mass in the breast and no signs of primary breast cancer on mammography and no detected primary tumour outside the breast.

Included studies assessed strategies to obtain histopathological diagnosis in case of positive MRI findings. Studies assessed MRI combined with either ultrasound or MRI guided localisation or biopsy. One study only included patients with occult cancer and suspicious lesions on breast MRI.

Two reviewers independently assessed studies for inclusion.

Assessment of study quality
Two reviewers independently assessed study quality using the 14-item QUADAS criteria.

Data extraction
Data were extracted to calculate sensitivity, specificity, success rate of sonographic biopsies, identified tumours at pathology and success rate of breast conserving surgery.

The authors did not state how many reviewers performed the data extraction.

Methods of synthesis
Pooled estimates were reported, but details on methods used to pool data were lacking. Where pooling was not possible, ranges in values were reported.

Results of the review
Eight retrospective studies were included (n=220, range 12 to 69). Seven studies enrolled an appropriate patient spectrum. All studies reported inclusion criteria and used an appropriate reference standard. Partial verification bias was avoided in all studies, but all were at risk of differential verification bias and incorporation bias.

The sensitivity of MRI for diagnosing the breast primary in occult breast cancer ranged from 36% to 86% with a summary estimate of 72% (seven studies; confidence interval not reported). Summary sensitivity of MRI for detecting a
malignant tumour was 90% (two studies). Specificity was lower at 22% and 50%.

MRI-detected lesions could be localised by ultrasound in 60% to 100% (summary estimate 80%; four studies) of patients. Data were not analyisable in a comparable format for studies of MRI-guided biopsy. Size (three studies) and localisation (two studies) of lesions found on MRI usually correlated closely with findings at pathology. Size of lesions detected by MRI ranged from 5mm to 30mm with a mean of 13mm to 17mm (three studies). Size on pathologic examination ranged from 1mm to 50mm with a mean of 5mm to 16mm (six studies). Breast MRI provided the possibility of breast conserving surgery in one third of patients.

**Authors’ conclusions**

Breast MRI can result in additional detection of otherwise occult lesions in occult breast cancer. Because of low specificity of malignant lesion detection by breast MRI, lesions should be histologically confirmed. This can be achieved either by MRI or ultrasound guided biopsy. Routine application of breast MRI in occult breast cancer may also alter locoregional treatments by offering the possibility of breast conserving surgery in one third of patients.

**CRD commentary**

The review addressed a broad objective. Inclusion criteria were adequately defined. The literature search was acceptable for published studies. But no specific attempts were made to locate unpublished studies and some language restrictions were applied, so there was a possibility of language and publication bias. Appropriate steps were taken to minimise bias and errors during study selection and quality assessment; it was unclear whether similar steps were taken for data extraction. Study quality was formally assessed with relevant criteria and the results were presented clearly. Details on the included studies were limited (especially in relation to the participants) which made it difficult to determine the generalisability of results. Methods used to pool studies were not reported and heterogeneity was not formally assessed. Some of the results were lacking in clarity and confidence intervals around summary measures were not reported. The included studies were all small and had methodological limitations. The authors’ conclusions should be interpreted with caution.

**Implications of the review for practice and research**

*Practice:* The authors stated that breast MRI should be routinely performed in patients with occult breast cancer.

*Research:* The authors did not state any implications for research.

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