Clinical Practice Guideline for the Indications for Use of Breast Magnetic Resonance Imaging (MRI)

Eastern Health Breast Disease Site Group

Question:

What are the current indications for breast MRI use?

Target Population:

These recommendations are aimed toward patients who meet the criteria outlined in the indications for the use of breast MRI.

Recommendations and Supporting Evidence:

Breast MRI does not replace conventional imaging (ie. mammography or ultrasound) and physical examination. A negative breast MRI also does not exclude the presence of malignancy or preclude the appropriate management of an otherwise suspicious finding. There is, however, evidence to suggest that the utilization of breast MRI may be helpful in improving patient outcomes (27,28). These are as follows:

1. Screening of High Risk Individuals:

Magnetic Resonance Imaging (MRI) has been shown to be superior in sensitivity to mammography, but significantly lower in specificity, resulting in a higher false-positive rate. Therefore, the recommendation would be for its use in screening only those patients deemed to be high risk. Patients with significant risk of developing breast cancer, would include those with:

- genetic predisposition (proven or presumptive)*(5,6,7,9,10)
- mediastinal radiation between the ages of 10 and 30 (8).

*see “Clinical Practice Guideline for Breast Screening with MRI for Patients at High Risk for Hereditary Breast Cancer” Eastern Health.
It is recommended that MRI and mammography be performed, alternating every six months, beginning at age 25. There is no role for breast MRI in the routine screening of asymptomatic patients, including those with a personal history of breast cancer such as invasive lobular or invasive ductal carcinoma, LCIS (lobular carcinoma in situ), DCIS (ductal carcinoma in situ), or ADH (atypical ductal hyperplasia).

2. **Breast Cancer Staging:**

There is good evidence (11,12,13) to suggest a role for performing breast MRI in women with biopsy proven breast cancer, such as those with:

- *infiltrating carcinoma or ductal carcinoma in situ* – MRI may be useful for evaluating size, extent, and possible multicentricity (multiple tumor sites in a different quadrant than, or at a distance of more than 5 cm from the index cancer) or multifocality (multiple tumor sites in the same quadrant, or within 5 cm of the index cancer). The histology of lobular carcinoma in particular, is found to be associated with a higher risk of multifocal and multicentric spread. However, in patients who are undergoing MRI to determine whether multifocal or multicentric disease is present, it should not be assumed, without histological confirmation, that all enhanced lesions are malignant. Such an assumption may lead to treatment with mastectomy, when lumpectomy is more appropriate. The ability to provide MR image-guided breast biopsy and localization of lesions depicted only on MR images is crucial.

- *possible contralateral breast lesion* – in those whom a malignancy has been found in one breast with mammography or ultrasound, MRI imaging may depict an occult malignancy in the contralateral breast.
3. **Assessment of Positive Margins following Breast Cancer Surgery:**
   
   - *previous lumpectomy (14,15,16)* - in patients who have recently undergone lumpectomy without preoperative MRI and those with close or positive surgical margins after lumpectomy, the extent of residual disease and possible multifocality or multicentricity demonstrated on MRI may help determine whether repeat excision or mastectomy is appropriate.

4. **Assessment of Response to Chemotherapy:**
   
   - *neoadjuvant chemotherapy (17,18)* – in patients with locally advanced breast cancer, MR imaging may be performed before, during, or after a chemotherapy regimen to evaluate the tumor response and the extent of residual disease before surgical intervention. If breast-conserving therapy is planned, a tissue marking clip should be placed within the malignancy by the radiologist, as the mammographic, sonographic, and clinical findings may no longer be apparent at imaging after treatment. Accurate measurement of the residual tumor may be difficult.

5. **Differentiation of Post Surgical Scarring from Recurrent Tumor:**
   
   - *visualization of recurrent disease (19,20,21)* – MRI may be helpful in differentiating normal post-lumpectomy scar tissue from possible recurrent/residual disease.

6. **Search for Source of Primary Malignancy when the Breast is normal by Conventional Imaging in the Presence of Tumor Positive Axillary Adenopathy:**
   
   - *axillary adenopathy (22,23,24)* – when axillary adenopathy is present but the findings from mammography, ultrasound, and physical examination are negative for primary malignancy, MRI may depict the site of primary malignancy in the breast.
7. **Problem Solving when Mammographic, Sonographic or Clinical Findings are Suspicious but Inconclusive:**

   - *inconclusive findings of breast cancer (19)* – MRI imaging may be helpful for lesion identification when findings at physical examination and conventional imaging modalities are suggestive of breast cancer, but are inconclusive.

8. **Assessment of Breast Implant Integrity:**

   - *breast augmentation (25,26)* – silicone implant rupture can be detected with MRI.

   If a patient does fit the criteria, screening breast MRI will be requested by the referring physician and reported by a radiologist with specific training in breast MRI. Non urgent breast MRI should be scheduled during the second week of the menstrual cycle (days 5 to 13) in premenopausal women. Occasionally, areas of normal hormonally sensitive breast tissue may enhance intensely on MRI which may cause a false positive reading. Therefore, examination is best performed in midcycle.
Guideline Development Process

The target users are of this guideline would be family physicians, other specialists, and other health care professionals.

The Eastern Health Breast Cancer Disease Site Group is a collaboration of professionals of all areas of health care, involved in the screening, diagnosis, and management of breast disease, in the province of Newfoundland and Labrador. These professionals include members of the provincial breast screening program, genetics program, radiologists, pathologists, surgical oncologist, medical oncologists, radiation oncologists, pharmacists, nurses, social workers, palliative care physicians and members of administration.

Due to rather limited resources, team leaders were designated for each discipline from the existing members of the Eastern Health Breast Cancer Disease Site Group. Literature searches were carried out by the Guidelines Coordinator and reviewed by the team leader, with which recommendations were then formulated, with input from all involved parties.

Literature searches were conducted in Pubmed, CINAHL, and the Cochrane Library and using keywords “breast MRI” AND “breast cancer”. All selected literature articles were in English and dated after the year 2000, unless the selection was a landmark study and would then be included.

Once the draft guideline has been developed, it is reviewed at the monthly meeting of the group. Feedback is welcomed, any revisions are carried out and consensus, where possible, is reached. The guideline is then circulated to select target users for feedback, and revisions made accordingly. The guideline is then presented to the administrative body for approval. Upon approval, it will be distributed to appropriate health care providers in the province.

This guideline will be reviewed and/or updated every 3-5 years, unless new research requires an earlier review.
These guidelines are a statement of consensus of NL Breast Disease Site Group regarding their views of currently accepted approaches to diagnosis and treatment. Any clinician seeking to apply or consult the guidelines is expected to use independent medical judgement in the context of individual clinical circumstances to determine any patient’s care or treatment.
Literature Support for Indications for Breast MRI


* These 4 are maybes.