MRI for Diagnosis and Staging of Breast Cancer

The role of magnetic resonance imaging (MRI) for the diagnosis and management of breast cancer continues to evolve. The most common use of MRI is for the diagnosis and evaluation of metastatic disease in organs such as brain, bones, lung, liver and other distant sites. The development of breast coils specific for breast tissue have led to the use of MRI as a method for identifying and defining disease within the breast. This use requires not only appropriate equipment, but also specialized radiologist. Ideally, breast MRI should be interpreted by the same radiologist who provides mammography and ultra-sound readings.

There are at least 5 uses for breast MRI

1. Pre-operatively to aid in surgical planning
2. Pre-operatively to identify occult disease in the opposite breast
3. As an aid to judge response during pre-operative, neo-adjuvant therapy
4. As an aid in diagnosis when disease is suspected, yet other tools are inconclusive
5. As a screening tool in women at high risk for breast cancer

The most unclear and controversial use of breast MRI is its use as a screening modality for women with a prior personal history of breast cancer, women with dense breast, and the general population.
Breast MRI has certain limitations (1). It is a more sensitive test than mammography.
This results in more diagnosis of breast cancer, but also results in an increased number of false positive test results. This causes more unnecessary biopsies, and increases anxiety for many women (2). Breast MRI can not visualize microcalcifications that typically signal ductal carcinoma in situ (DCIS). Mammography is superior for this purpose (3). A positive finding on MRI requires a biopsy. Many facilities are not equipped to perform biopsies with MRI guidance, thus a second procedure is often required.

(4) Breast MRI is expensive and insurance coverage cannot always be obtained.

(5) There are no formal practice standards for breast MRI as there are for mammography. Identifying an experienced reader is critical.

An unanticipated consequence of increased breast MRI imaging at time of breast cancer diagnosis is an observed increase in mastectomy rate. Presumably, this is due to the increased sensitivity of MRI in identifying multifocal disease that may not be apparent with mammography and ultrasound. The clinical significance of such occult disease is unclear. It is possible that even if undetected and therefore not surgically resected radiation therapy and systemic drug therapy would treat this disease resulting in no impact on recurrence or survival.
In summary, the role of MRI in the diagnosis and management of breast cancer continues to evolve. Its use is increasing but remains limited to specific populations and clinical settings.