

Quality Assurance Assessment of Breast MRI

The Problem

The Mammography Quality Standards Act (MQSA) of 1992 established a precedent in the practice of mammography by creating federal quality standards for all parts of the mammography system. However, MQSA has not been formally mandated for breast MRI examinations as the technology developed well after the act was passed. MQSA can be used to compare programs and analyze whether a specific program meets certain industry standards. To date, there is no such program in breast MRI and no such known standards.

Aim/Goal

- To design a method to analyze a large volume of examinations and begin development of a quality assurance assessment method.
- Factors analyzed included, but not limited to, (1) MR exam characterization in terms of study indication, diagnostic quality and BIRADS assignment and (2) Assessment of biopsy results of abnormal MR exam to calculate cancer detection rate.

The Team

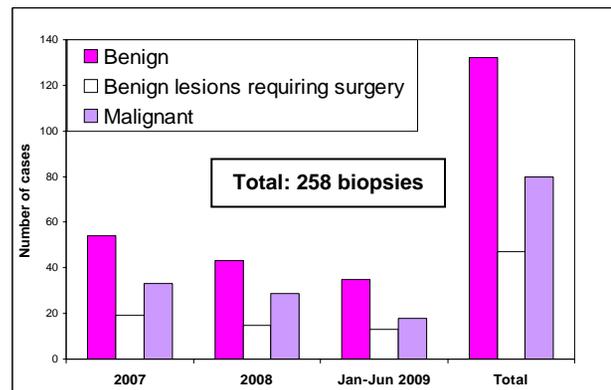
Diana M. Ferris, M.D., Ph.D., PGY5, 4th year radiology resident
Valerie Fein-Zachary, M.D., Radiology, Breast imaging staff
Priscilla Slanetz M.D., M.Ph., Radiology, Breast imaging staff
Tejas Mehta, M.D., M.Ph., Radiology, Breast imaging staff
Shambhavi Venkatarman, M.D., Radiology, Breast imaging staff

The Interventions

- 2057 MRI examinations were reviewed from 1/2007 through 6/2009.
- Data were collected in Excel and data analysis performed to meet the aims and goals of the project.
- Problems regarding a breast MR biopsy device were identified and a new device was purchased for breast biopsies in late 2008.

The Results/Progress to Date

Breast biopsies were categorized as benign, malignant, or benign lesions requiring surgery as per pathologic established standards.



- The positive predictive value of radiology biopsies averaged 31% over 2.5 years, corresponding to a detection rate of 49.5 cancers per 1000 patients with the inclusion of surgical excision data.
- Over the 2.5 yrs, there were 10 cases upgraded to malignancy at surgery.
- Half of these may have been secondary to lesions missed at biopsy.
- Four, or 80% of cases occurred before our device change from a repeated insertion device with internal vacuum to a stationary biopsy device with external vacuum, versus a single missed case after the device change.

Lessons Learned

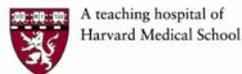
- Our cancer detection rate of 49.5 per 1000 patients is substantially higher compared to our screening (4 per 1000) and diagnostic (25 per 1000) programs.
- A simple change in clinical practice, such as changing to a biopsy device with a different design substantially improved the missed lesion rate.

Next Steps/What Should Happen Next

- This work forms the basis of a method to assess quality measures in a breast MRI program and could be applied at other academic centers, community hospitals and private practices.
- Further work could be done to assess malignancy rates per initial BIRADS study designation, for example.
- The main challenge in this work remains the significant time required to collect the data to perform this type of analysis. A database system that could be automatically populated from issued radiology reports based on key words would aid substantially in overall data efficiency.



Beth Israel Deaconess
Medical Center



THE SILVERMAN INSTITUTE
For Healthcare Quality and Safety

For More Information Contact
Diana M. Ferris, MD, PhD, Radiology Resident
dferris@bidmc.harvard.edu