

Poster presentation

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The role of cardiac MRI for serial assessment of left ventricular ejection fraction in breast cancer patients

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Background

Breast cancer and cardiovascular disease are major public health concerns worldwide. The two diseases are intricately involved as treatment of one disease may lead to detrimental effects in the other. Although the current combination of surgical resection, radiotherapy, and chemotherapy may lead to remission in breast cancer patients, the administration of chemotherapeutic based agents, in particular Doxorubicin, are associated with an increased risk of cardiotoxicity. The introduction of novel monoclonal antibodies in breast cancer therapy, including Trastuzumab (Herceptin), which target growth factor receptors, further compounds this issue of drug induced cardiac dysfunction. Although serial multi gated acquisition scans (MUGA) are the conventional method for baseline and serial assessment of left ventricular ejection fraction (LVEF), little is known about the use of cardiac MRI (CMR) in this clinical setting.

Objective

The aim of the current study was to assess the accuracy of MUGA, 2D transthoracic echocardiography (TTE) and 3D TTE in comparison to CMR in a breast cancer population receiving doxorubicin and trastuzumab in the adjuvant setting.

Methods

Between 2007-2009 inclusive, 50 female patients with HER-2 positive breast cancer were identified to have

received adjuvant trastuzumab following doxorubicin at a single tertiary care centre. Serial MUGA, 2D TTE, 3D TTE and CMR were performed at baseline, 6 months and 12 months following the initiation of trastuzumab therapy in all 50 patients.

Results

A comparison of left ventricular end systolic (LVESV) and end diastolic volumes (LVEDV) demonstrated a modest correlation between 2D TTE and CMR ($r^2 = 0.78$ and $r^2 = 0.74$ respectively). A comparison of LVESV and LVEDV between 3D TTE and CMR demonstrated a stronger correlation ($r^2 = 0.97$ and $r^2 = 0.95$). Although 2D TTE demonstrated a weak correlation with CMR for LVEF assessment ($r^2 = 0.58$), both 3D TTE and MUGA showed a stronger correlation when compared to CMR ($r^2 = 0.95$) (Figures 1A and 1B).

Conclusion

As compared to conventional MUGA, CMR is a safe, accurate and reproducible alternate imaging modality for the serial monitoring of LVEF in breast cancer patients receiving chemotherapy.

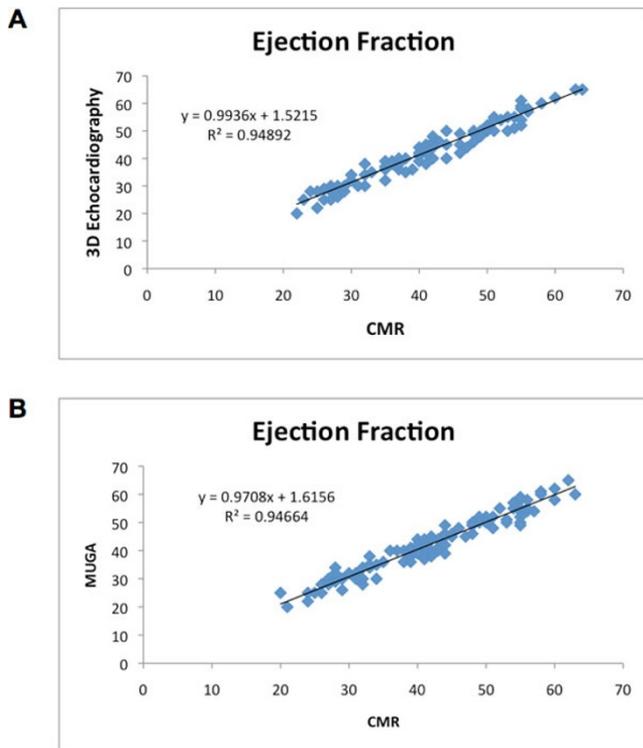


Figure 1

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