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A Prospective Pilot Safety Study for Performing MRI in Patients who have Breast Tissue Expanders

Introduction: Breast tissue expanders (BTEs) are implanted devices used following mastectomy to gradually stretch the overlying skin in preparation for a permanent implant. Saline is injected into the implant through a port over time, gradually expanding the chest wall and overlying skin. Presence of metal and/or a small magnet in the port has led manufacturers to designate BTE as “MR Unsafe,” which prevents patients with these medical devices from undergoing MRI. We conducted an IRB approved, prospective study to assess the safety of BTEs in MRI. We hypothesize that patients with BTEs can safely undergo an MRI examination under certain parameters.

Methods: Our study prospectively recruited 60 patients with BTE who needed standard of care MRI. Patients were scanned on a 1.5T scanner using standard of care sequences at our institution. The consent form was valid for 1 year, allowing patients to obtain multiple scans with BTE. Certain MRI examinations (i.e. cardiac and breast) were avoided if the region of interest would be affected by artifact from the BTE.

We examined how many scans were successfully completed, and how many were limited by BTE induced artifacts. Participants of the study were assessed for pain levels prior and after the MRI. Assessment was performed with questionnaires containing a validated Patient-Reported Outcomes Measurement Information System (PROMIS).

Results: The rate of successful MRI scans completed in patients with BTEs was 100%, with a total of 107 successfully completed MRI scans for 60 patients (107/107). Out of the 60 patients scanned, 57 were able to fill out the PROMIS questionnaires. There was no significant difference in pain scores obtained before and after the MRI ($p=0.62$)

Conclusion: Our results suggest that MRI can be safely performed for patients with BTEs, with most patients experiencing no pain nor adverse effect.