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**In Vitro Assessment of MRI Issues at 3-Tesla for a Breast Tissue Expander with a Remote Port.**

[Linnemeyer H](http://www.ncbi.nlm.nih.gov/pubmed?term=Linnemeyer%20H%5BAuthor%5D&cauthor=true&cauthor_uid=24418326)1, [Shellock FG](http://www.ncbi.nlm.nih.gov/pubmed?term=Shellock%20FG%5BAuthor%5D&cauthor=true&cauthor_uid=24418326)2, [Ahn CY](http://www.ncbi.nlm.nih.gov/pubmed?term=Ahn%20CY%5BAuthor%5D&cauthor=true&cauthor_uid=24418326)3.

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**Abstract**

**OBJECTIVES:**

A patient with a breast tissue expander may require a diagnostic assessment using magnetic resonance imaging (MRI). To ensure patient safety, this type of implant must undergo in vitro MRI testing using proper techniques. Therefore, this investigation evaluated MRI issues (i.e., magnetic field interactions, heating, and artifacts) at 3-Tesla for a breast tissue expander with a remote port.

**METHODS:**

A breast tissue expander with a remote port (Integra Breast Tissue Expander, Model 3612-06 with Standard Remote Port, PMT Corporation, Chanhassen, MN) underwent evaluation for magnetic field interactions (translational attraction and torque), MRI-related heating, and artifacts using standardized techniques. Heating was evaluated by placing the implant in a gelled-saline-filled phantom and MRI was performed using a transmit/receive RF body coil at an MR system reported, whole body averaged specific absorption rate of 2.9-W/kg. Artifacts were characterized using T1-weighted and GRE pulse sequences.

**RESULTS:**

Magnetic field interactions were not substantial and, thus, will not pose a hazard to a patient in a 3-Tesla or less MRI environment. The highest temperature rise was 1.7°C, which is physiologically inconsequential. Artifacts were large in relation to the remote port and metal connector of the implant but will only present problems if the MR imaging area of interest is where these components are located.

**CONCLUSIONS:**

A patient with this breast tissue expander with a remote port may safely undergo MRI at 3-Tesla or less under the conditions used for this investigation. These findings are the first reported at 3-Tesla for a tissue expander.

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**KEYWORDS:**

Breast reconstruction expanders, Diagnostic MRI, MRI, Tissue Expansion, safety

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