

## **Breast tissue expanders and MRI: Defining surgeons' opinions, clinical outcomes, and optimal parameters for safety**

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**INTRODUCTION:** Manufacturers' claims that internal (ferromagnetic) port-containing breast tissue expanders (FPCBTE) are contraindicated in magnetic resonance imaging (MRI) surprisingly lack direct experimental basis, and may unwittingly negatively impact patient care. This study sought to define surgeons' opinions on the compatibility of MRI and FPCBTE, determine if they can be safely combined, and identify modifiable variables that can maximize safety.

**MATERIALS AND METHODS:** First, ASPS members were given a validated, web-based survey of their opinions on the compatibility of FPCBTE and MRI. Second, a review of patients with FPCBTE who had undergone 1.5 Tesla (T) MRI has been performed. Finally, *ex-vivo* study of FPCBTE from each FDA-approved manufacturer (Natlrelle, Sientra, and Mentor) was undertaken in different MRI settings (3T, shielded 1.5T, and unshielded 1.5T), measuring both torque and deflection angle.

**RESULTS:** In the survey, 48% of survey respondents believe FPCBTE is an absolute contraindication to MRI, and a full 28% reported that they would only offer delayed reconstruction if the possibility of requiring an MRI existed. Finally, 75% would recommend non-MRI imaging or an additional anesthetic episode if a patient with FPCBTE required MRI. In the clinical series, there were no complications (pain, heat, migration, skin changes, or capsule changes) among 71 women with FPCBTE who underwent 1.5T MRI. In the *ex-vivo* study, Natrelle devices had the least torque and smallest deflection angles in all 3 environments, and that unshielded 1.5T MRI exerted the least ferromagnetic effect in devices from each of the 3 manufacturers.

**CONCLUSIONS:** Our study confirms that the compatibility of FPCBTE and MRI is largely misunderstood, it is possible for MRI to be safely performed with FPCBTE in place, and, in an experimental setting, Natrelle devices in unshielded 1.5T MRI were least affected by the magnetic force. This study defines a widespread misunderstanding that has implications for a generation of women, and works towards a better understanding of the modifiable variables that can allow women to undergo the safest, highest quality breast reconstruction.