

3D ANIMATED VISUALIZATION OF PVDF VISIBLE MESH IMPLANT AFTER SACROCOLPOPEXY

Hypothesis / aims of study

Standard polypropylene (PP) implants cannot be depicted with radiography. In times of mesh discussions and regulatory affairs in pelvic floor surgery we pursue a new concept with the polyvinylidenfluoride (PVDF) visible mesh. This mesh type features superior material characteristics in comparison to PP (1) and is loaded with iron particles that can be visualized on MRI. In 2013 Hansen et al. initially reported on PVDF hernia mesh loaded with superparamagnetic iron oxides in humans and visualization with MRI (2). For the first time we produced an animated 3D reconstruction of the implanted mesh after sacrocolpopexy with actual MRI data.

Study design, materials and methods

Since April 2013 we utilized the PVDF visible mesh implantat (DynaMesh® PR visible, FEG Textiltechnik, Aachen, Germany) for sacrocolpopexy in eight patients, six times with the complete extraperitoneal technique. In two cases a colposuspension was added due to stress urinary incontinence. Afterwards we conducted dynamic MRI studies and reproduced the mesh implant in the actual postoperative position with 3D graphical software.

Results

In all dynamic MRI sequences the mesh implants could be visualized well. With the transversal slices the visible mesh could be reconstructed and further animated in 3D. Thereby the postoperative shape and position of the mesh implants could be demonstrated. In a next step the structures of the pelvic bones and organs were added to the mesh animations and therefore the actual result of the pelvic floor repair could be visualized. These 3D reconstructions offer an isolated view of the postoperative behaviour of the mesh and also of the relation to the adjacent organs.

Interpretation of results

The utilization of the MRI visible mesh implant in pelvic floor surgery allows the visualization of the postoperative result and possible sequelae. Postoperative complaints can better be diagnosed and repeated surgery may be avoided. This innovative technique essentially contributes to the ongoing mesh discussion in terms of material characteristics as well as mesh positioning and fixation in the pelvis. Furthermore the 3D imaging technique with visible mesh offers excellent opportunities for future developments in pelvic floor surgery.

Concluding message

The visible mesh implant has demonstrable advantages in the visualization of postoperative results in pelvic floor surgery. This should initiate further observational studies that correlate these mesh illustrations with clinical findings.

References

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2. Hansen NL, Barabasch A, Distelmaier M, Ciritsis A, Kühnert N, Otto J, Conze J, Klinge U, Hilgers RD, Kuhl CK, Krämer NA. First in-human magnetic resonance visualization of surgical mesh implants for inguinal hernia treatment. *Invest Radiol.* 2013;48(11):770-778

Disclosures

Funding: None **Clinical Trial:** No **Subjects:** HUMAN **Ethics not Req'd:** retrospective non-invasive observation of postoperative findings that did not influence therapy decision making. Subject of the study is ex post imaging and software processing. **Helsinki:** Yes **Informed Consent:** Yes