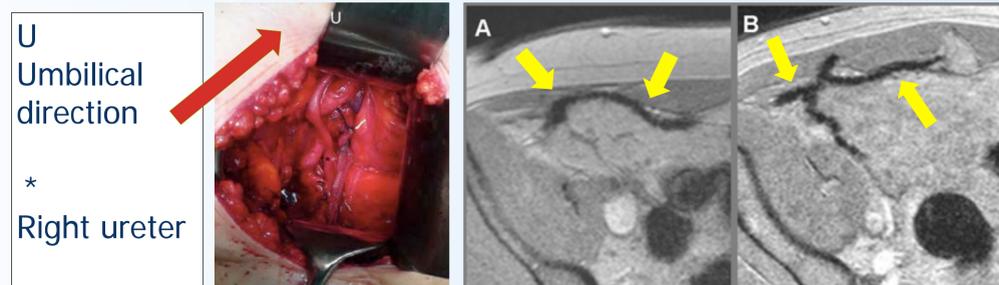


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Abstract
Introduction and Objective
Sacrococcolpopexy is a standard procedure for the treatment of genital prolapse in women. It connects two extraperitoneally located structures, the sacrum and the vaginal cuff. In contrast to the usual transperitoneal route (open or laparoscopic) it appears reasonable to proceed extraperitoneally from the beginning and leave the peritoneal cavity unharmed. This method with the use of a conventional polypropylene mesh was introduced by Onol et al. in 2011. The utilization of PVDF (Polyvinylidenfluoride) mesh loaded with iron particles for hernia repair in humans and the visualization on MRI was first reported by Hansen et al. in 2013. We present a novel technique with a combination of these two innovative methods.
Methods
From 06/2014 to 10/2017 15 patients had a completely extraperitoneal sacrococcolpopexy with PVDF visible mesh implant (DynaMesh® PR visible, FEG Textiltechnik, Aachen, Germany). Five patients had a concomitant burch colposuspension for stress urinary incontinence. In selected patients pre- and postoperative dynamic MRI studies were conducted for the evaluation of the pelvic floor defect and its correction together with the demonstration of the visible mesh implant.
Results
In all 15 cases a complete anatomic and functional correction of the prolapse was achieved. No complications occurred. The surgical technique is demonstrated step by step. The mesh implant could be visualized with the experience of the MRI settings for hernia meshes. Dynamic sequences could well demonstrate the correction of the pelvic floor defect. In addition, 3D images and animations of the meshes were created from the MRI data sets with further useful information of the postoperative position and shape of the meshes and their relation to the pelvic organs.
Conclusions
The extraperitoneal sacrococcolpopexy is an excellent procedure for the correction of genital prolapse in women and less harmful than the transperitoneal approach. The utilization of the PVDF visible mesh implants enables the visualization of the surgical result and possible sequelae. Further enhanced 3D animations of the mesh and pelvic organs offer new perspectives for scientific purposes.

Objectives



Yellow arrow: Iron oxide loaded mesh



Introduction of extraperitoneal Sacrococcolpopexy in 2011 by Onol et al. [1]

First report of Polyvinylidenfluoride (PVDF) mesh loaded with super-paramagnetic iron oxides in humans and visualization with MRI in 2013 by Hansen et al. [2]. MRI studies of mesh (A, B) with gradient echo sequence (GRE) after inguinal hernia repair with laparoscopic (TAPP) technique.

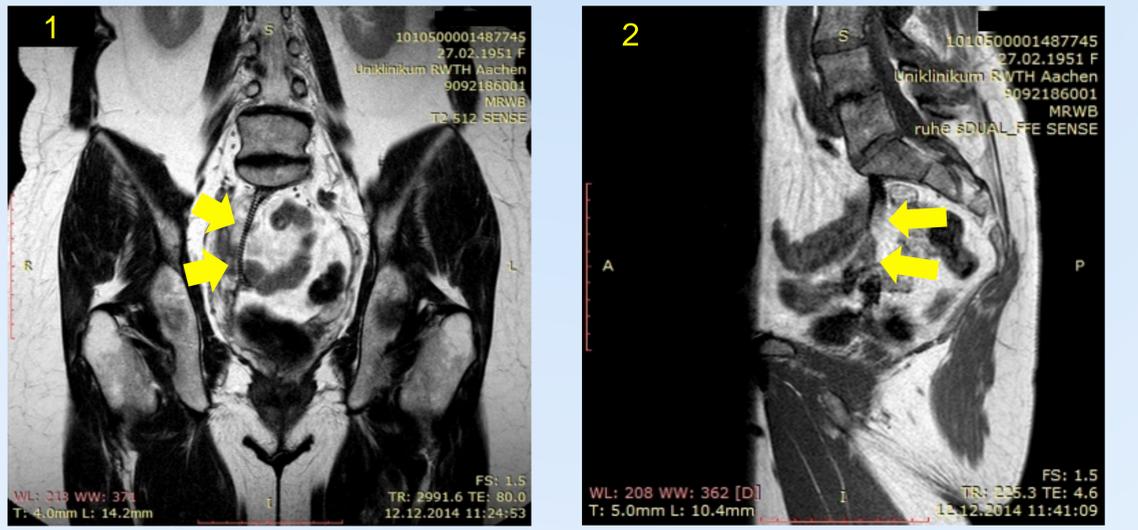
References

1. Onol FF, et al. Int Urogynecol J 2011;22:855-861
2. Hansen NL, et al. Invest Radiol. 2013;48:770-778

Methods

Technique of complete extraperitoneal sacrococcolpopexy

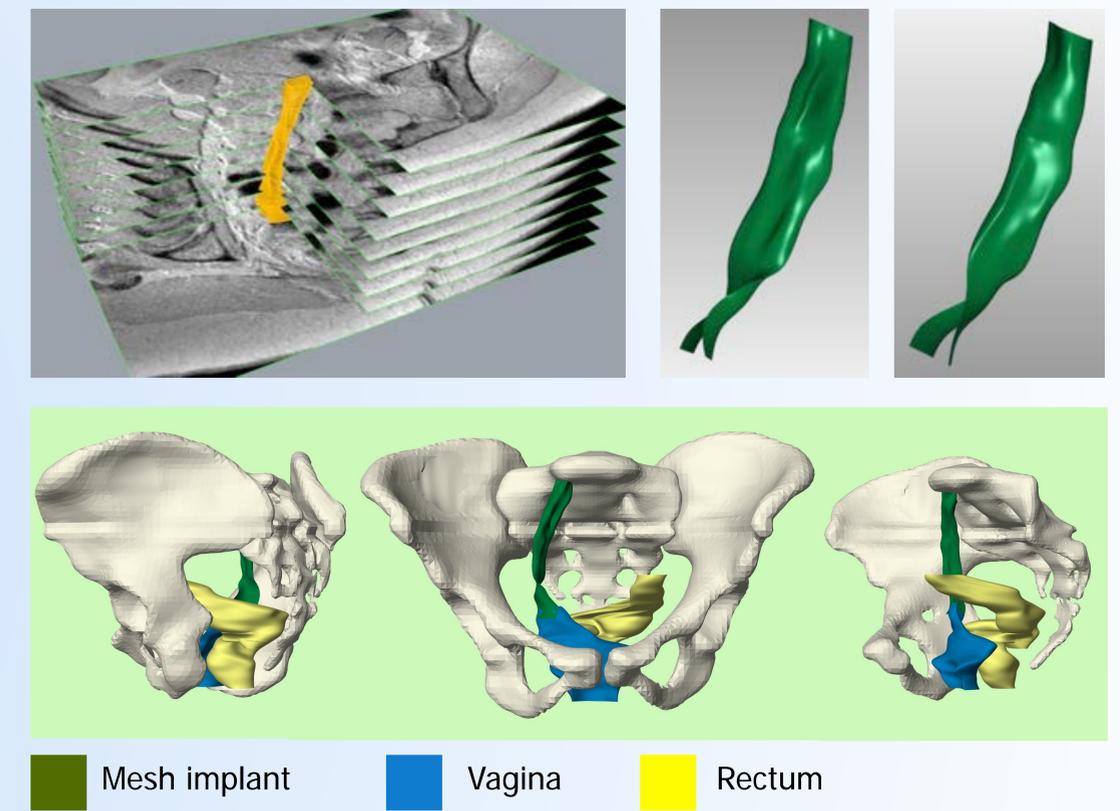
	10 cm Pfannenstiel incision and blunt exposure of the retroperitoneum on the right side		V-shape folding of mesh (DynaMesh® PR visible, FEG, Germany) Suturing of top end to longitudinal ligament
	Only the obliterated umbilical artery has to be divided		Retroperitoneal exposure of vaginal cuff with intravaginal retractor
	The peritoneal cavity is mobilized medially, exposure of the anterior longitudinal ligament		Posterior aspect of mesh is sutured (4 - 6 absorbable) to the vaginal cuff, then the anterior part
	3 non-absorbable sutures are placed transversely through the ligament		With no tension the mesh lies retroperitoneally. Usually no drainage is required



Coronary (1) and sagittal (2) T2wTSE (Turbospinecho) Sequences (→Mesh)

Results

Rendering of MRI sections to 3D figures of the visible mesh



Green: Mesh implant, Blue: Vagina, Yellow: Rectum

Conclusions

15 patients with completely extraperitoneal sacrococcolpopexy with PVDF visible mesh implant (DynaMesh® PR visible, FEG Textiltechnik, Aachen, Germany). Complete anatomical and functional correction of the prolapse. No complications occurred. Excellent and less harmful procedure than the transperitoneal approach. PVDF visible mesh enables the visualization of the surgical result. The combination of these methods is a reasonable alternative to the existing techniques and also offers new perspectives for scientific purposes.