91

Letouzey V[1], Huberlant S[1], Cornille A[1], Blanquer S[2], Garric X[2], de Tayrac R[1]
1. *University Hospital Caremeau,* ***2.*** *IBMM CRBA Montpellier University 1*

TOWARDS POLYPROPYLENE MESH VISUALIZATION ON MRI

Hypothesis / aims of study

When pelvic organ prolapse has been identified as symptomatic, an important part of its treatment is surgery. The main indication of synthetic mesh placement on pop repair is to prevent recurrence.

Synthetic meshes are on controversies about complications as pelvic pain, re intervention for vaginal erosion or *de novo* dyspareunia. Last facts have concluded to a common used of polypropylene mesh by vaginal route and possible by laparoscopy.

The better morphologic exam on pelvis seems to be MRI, the most reproducible. Pelvic ultrasonography is limited to bone inter position and to operator limits.

As a minimal invasive surgery, pop recurrence mechanisms are unknown. Pelvic pain is difficult to associate to mesh complication.

To understand, manage and optimize polypropylene mesh used on pop repair (vaginal or laparoscopic route), a good follow up visualization on pelvic MRI would be of great interest, but polypropylene meshes are not spontaneously visible on MRI.

To visualize synthetic mesh in case of surgical pelvic organ prolapse (POP) repair with polypropylene mesh placement. To associate to polypropylene mesh a contrast agent which should permit to identify mesh in the pelvis by MRI. Mesh must be seen at different time and on different clinical used MRI (1.5 Tesla (T), 3 Teslas).

Study design, materials and methods

Gadolinium was chosen as a contrast agent in the form complexed with diethylene triamine pentaacetic acid (DTPA). Two polymers have been grafted covalently: a resorbable (Poly Capro Lactone, PCL), the other non-absorbable (poly methyl acrylate, PMA). We conducted a coating polypropylene mesh with these grafted polymers.

The MRI evaluation was performed on a 7 Teslas research MRI, and on 1.5 Tesla and 3 Tesla clinical MRI.

Visualization and tolerance have been studied both *in vitro* and *in vivo* in Wistar rats in a model of double dorsal implantation intramuscular and subcutaneous.

Tolerance *in vivo* was performed by investigating gadolinium in various organs of the model and histological analysis of adjacent organs.

Results

We got a prosthetic display *in vitro* and *in vivo*, on the different MRI, with better visibility and a tolerance for non-absorbable polymer. (Figure 1). Figure 1 shows a wistar rat with 4 dorsal meshes implantation, 2 coated meshes at the left of the spina (2.5x0.5 cm intramuscular & 2.5x1cm subcutaneous) and 2 at the right no coated.

A = dorsal rat implantation 3D Abdominal pelvis reconstruction, on 1.5T MRI

B = Left side coated meshes and right side no coated meshes

C= 3D reconstruction of the both coated meshes

The clinical tolerance and the toxicology results of the coated meshes were satisfactory at 18 months follow up.

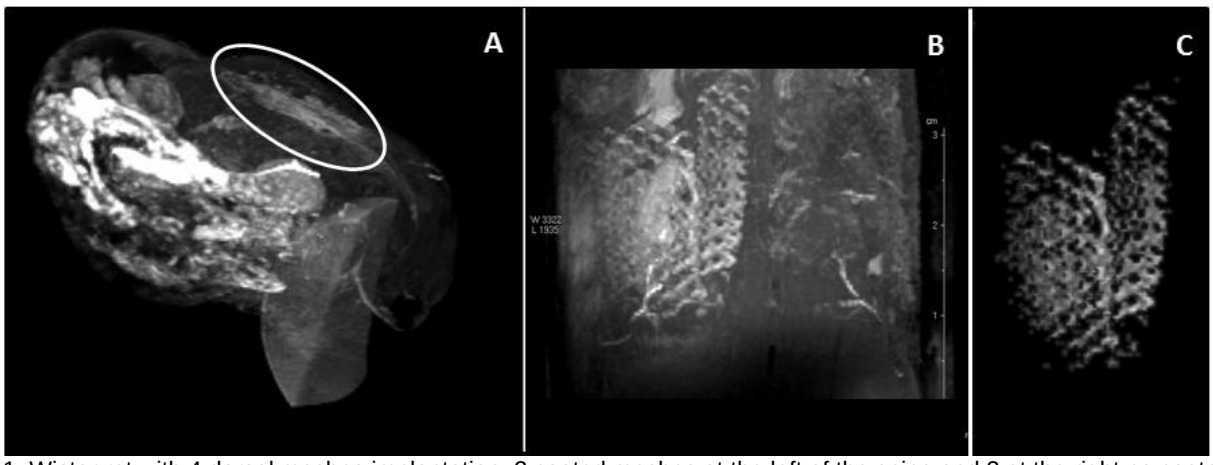

Figure 1. Wistar rat with 4 dorsal meshes implantation, 2 coated meshes at the left of the spina and 2 at the right no coated.

A = dorsal rat implantation 3D Abdominal pelvis reconstruction, on 1.5T MRI

B = Left side coated meshes and right side no coated meshes

C= 3D reconstruction of the both coated meshes

Interpretation of results

Concluding message

For the first time graft have been viewed both with a research engine (7T) and on a conventional clinical MRI (1.5 and 3 T), and this both *in vitro* and *in vivo*.

Disclosures

Funding: none **Clinical Trial:** No **Subjects:** ANIMAL **Species:** CEEA LR 1010 **Ethics Committee:** CEEA LR