

## EXPERIMENTAL BIOCOMPATIBILITY AND BIOMECHANICAL EVALUATION OF SILK PROTEIN-COATED LOW-WEIGHT POLYPROPYLENE MESHES

### Hypothesis / aims of study

To determine the biocompatibility and biomechanical characteristic of silk protein coated polypropylene meshes in abdominal hernia rabbit model.

### Study design, materials and methods

12 Gynemesh® and 12 Aspide® polypropylene meshes (6 silk protein coated and 6 noncoated) were surgically implanted in 6 adult female New Zealand hernia rabbit model. Every two animals were killed at 30 days, 60 days and 90 days after transplant surgery respectively. Full-thickness sections of abdominal wall included transplant meshes were evaluated in inflammation, neovascularization, fibroblastic proliferation and collagen formation by transmission electron microscope (TEM), HE staining and Masson staining. These samples were tested biomechanical parameters in the same time.

### Results

No mesh erosion was observed. Silk protein-coated low-weight polypropylene meshes showed a mild inflammatory response with minimal fibrosis and good host tissue incorporation within the grafts. Few apoptotic and necrotizing cells were found in noncoated meshes. The deformation and Young's elastic modulus of silk protein coated mesh implantation are better than noncoated mesh. The biomechanical parameters were getting strong with time.

### Interpretation of results

Mesh erosion was a common phenomenon in modern pelvic floor reconstructive surgery. Modification of mesh will increase the biocompatibility and biomechanical characteristic of implanted material, and decrease the ratio of erosion.

### Concluding message

Silk protein coated meshes elicit a mild foreign body reaction, minimal fibrotic response and good host tissue incorporation within the grafts. The biomechanical parameters of silk protein coated meshes were better than noncoated mesh.

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<b><i>Is this a clinical trial?</i></b>	<b>No</b>
<b><i>What were the subjects in the study?</i></b>	<b>ANIMAL</b>
<b><i>Were guidelines for care and use of laboratory animals followed or ethical committee approval obtained?</i></b>	<b>Yes</b>
<b><i>Name of ethics committee</i></b>	<b>Independent Ethics Committee OF Hospital</b>