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BIOMECHANICAL PROPERTIES OF SILK PROTEIN–COATED POLYPROPYLENE MESH

Hypothesis / aims of study
To study Biomechanical properties of silk protein coated polypropylene mesh.

Study design, materials and methods
Twelve polypropylene meshes (size 30mm×30mm, 6 silk protein–coated mesh and 6 noncoated mesh) were surgically implanted in 6 abdominal hernia rabbit model. Each rabbit had six abdominal wall defects. Four abdominal wall defects were for silk protein coated and noncoated polypropylene mesh, other two defects without mesh as the controls. Every two animals were killed at 30 days, 60 days and 90 days after surgery respectively. 3.5cm×3.5cm full-thickness tissues of the rabbit's abdominal wall were divided into three strips, 3.5cm × 1cm for each .Took the middle one for tensile test, statistical analysis for the maximum tensile stress of broken, deformation of broken, tensile stress for fail and Young's elastic modulus.

Results
Tension parameter of all meshes were higher than the control group. Tensile stress for broken of noncoated meshes lower than coated meshes. Biomechanical properties improved over time (Fig 1 to Fig 3).

Interpretation of results
Silk protein-coated polypropylene mesh can increase the biocompatible of polypropylene mesh. So that the biomechanical properties of silk protein-coated polypropylene mesh was better than noncoated polypropylene mesh.

Concluding message
Silk protein-coated polypropylene mesh can improve the biomechanical properties of polypropylene meshes.

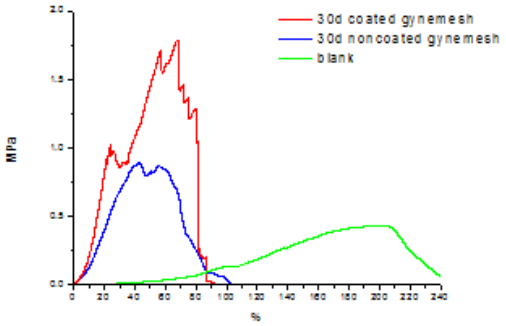


Fig1 The stress strain diagram after implant 30 days

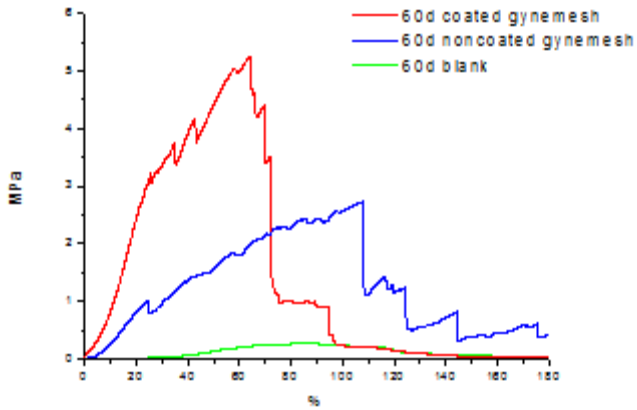


Fig2 The stress strain diagram after implant 60 days

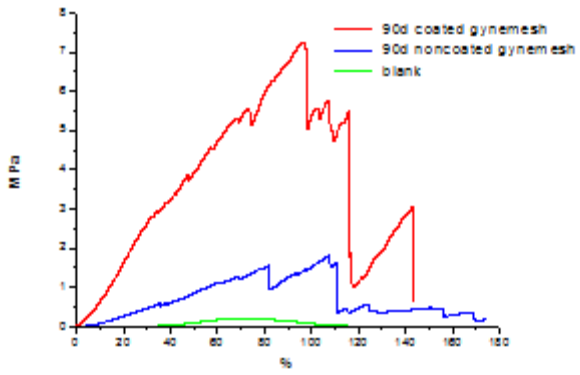
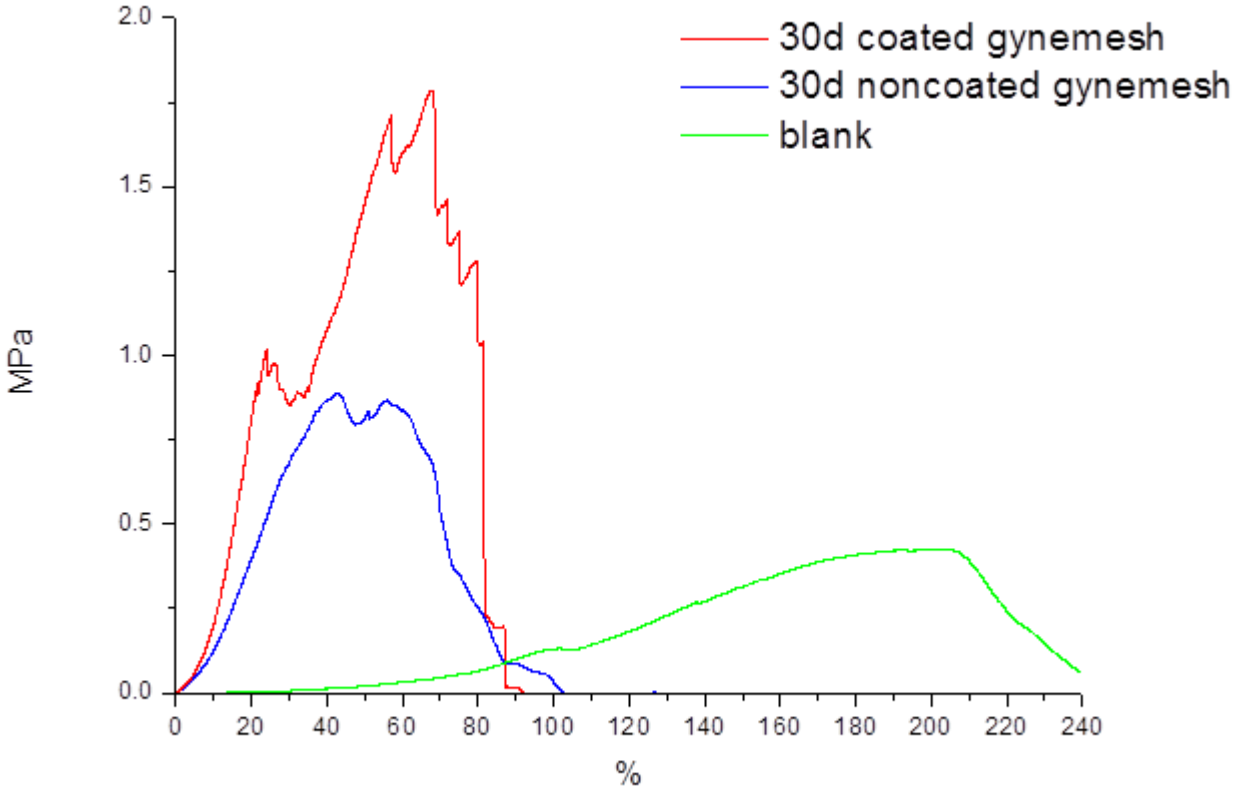


Fig3 The stress strain diagram after implant 90 days



Disclosures
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