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Mesh implants: An overview of crucial mesh parameters

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Abstract

Hernia repair is one of the most frequently performed surgical interventions that use mesh implants. This article evaluates crucial mesh parameters to facilitate selection of the most appropriate mesh implant, considering raw materials, mesh composition, structure parameters and mechanical parameters. A literature review was performed using the PubMed database. The most important mesh parameters in the selection of a mesh implant are the raw material, structural parameters and mechanical parameters, which should match the physiological conditions. The structural parameters, especially the porosity, are the most important predictors of the biocompatibility performance of synthetic meshes. Meshes with large pores exhibit less inflammatory infiltrate, connective tissue and scar bridging, which allows increased soft tissue ingrowth. The raw material and combination of raw materials of the used mesh, including potential coatings and textile design, strongly impact the

inflammatory reaction to the mesh. Synthetic meshes made from innovative polymers combined with surface coating have been demonstrated to exhibit advantageous behavior in specialized fields. Monofilament, large-pore synthetic meshes exhibit advantages. The value of mesh classification based on mesh weight seems to be overestimated. Mechanical properties of meshes, such as anisotropy/isotropy, elasticity and tensile strength, are crucial parameters for predicting mesh performance after implantation.

Keywords: Hernia mesh; Hernia repair; Incontinence mesh implant; Mechanical parameters; Mesh properties; Mesh weight; Structure parameters; Synthetic mesh; Synthetic raw materials; Textile structure.

Figures

Figure 1 Crucial mesh parameters for selection…

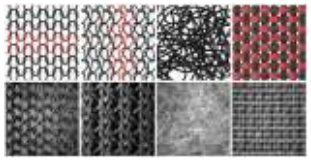

Figure 2 Textile structures from left to…

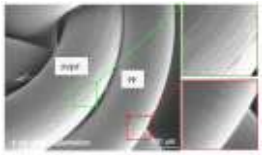

Figure 3 Comparison of the *in vivo* …

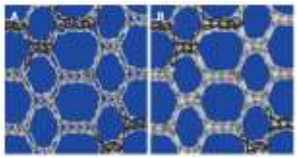

Figure 4 Comparison of the textile porosity…

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