

HYBRID LOW-COST SYNTHETIC HERNIA MESH FOR ABDOMINAL WALL RECONSTRUCTION

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Introduction:

The 2009 European Guidelines concluded that all adults over the age of 30 with a symptomatic abdominal wall hernia should be operated on using a mesh-based technique. Sorensen and Rosenberg [2] reviewed different studies involving implantation of mosquito nets in humans and found that, overall, the rate of short-term complications was similar to that associated with commercial meshes and the cost was much lower. This study aims to characterize the mechanical properties and ultrastructure of a low-cost synthetic meshes.

Methods:

Micrographs of the meshes (Mountain Warehouse, UK) were taken with the Scanning Electron Microscope (SEM) (FEI XL30, UK). Mechanical properties of the nylon fabrics were tested with a uniaxial tensile system (BT1-FR5.0TN, Germany) where the samples (N=8) were held to a 0.5 kN loading cell in position controlled mode.

Results:

Figure 1 represents micrographs of the large and small pores meshes with a pore size of 2.52 ± 0.048 mm and 1.160 ± 0.069 mm respectively, considering the longest distance between two opposite angles of a pore. Figure 2 (left) shows the average break stress between large and small pore meshes, 13.78 ± 1.09 MPa and 17.22 ± 2.19 MPa respectively. Average break strain (Figure 2, right) for the large pores mesh was 130.49 ± 16.56 %, demonstrating greater extensibility than the small pores mesh at 110.26 ± 8.87 %.

Discussion & Conclusion:

The large pores mosquito net mesh can offer alternate for abdominal wall repair in low cost settings since it has mechanical properties, in particular break stress, closer to that of the rectus sheath. Future works will involve biocompatibility tests of the mesh with human dermal fibroblasts.

References:

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Disclosures: None

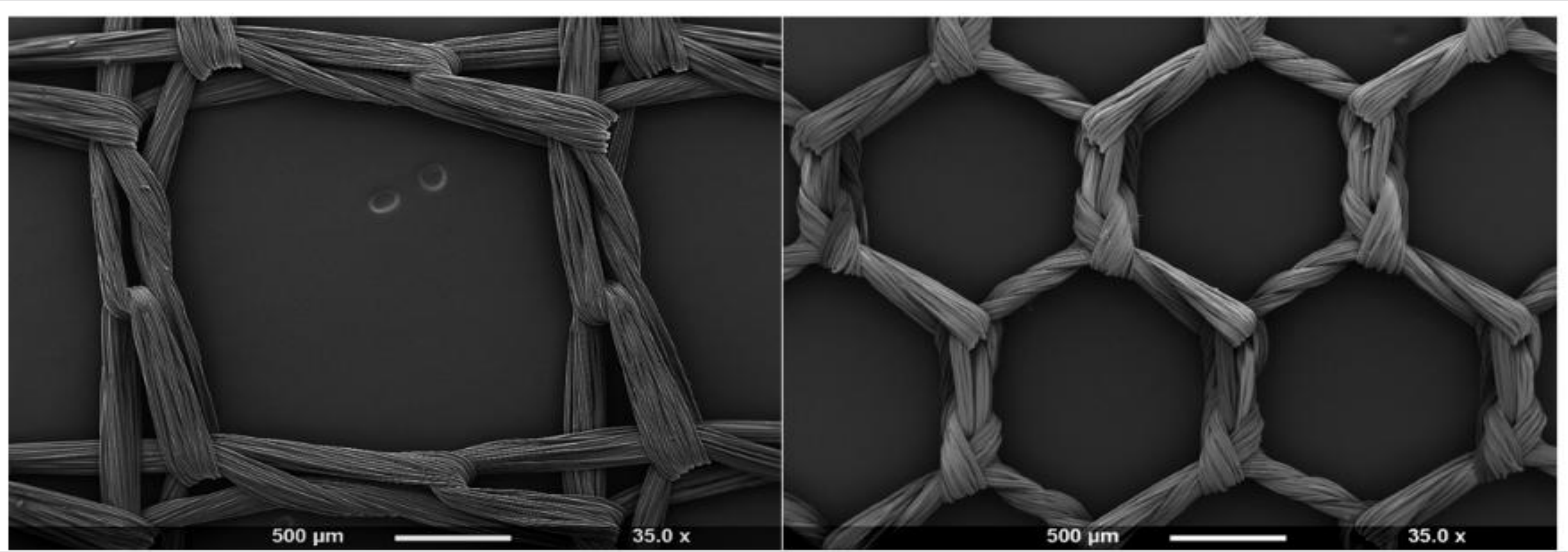


Figure 1 . Micrographs of large pores (left) and small pores (right) meshes (35x).

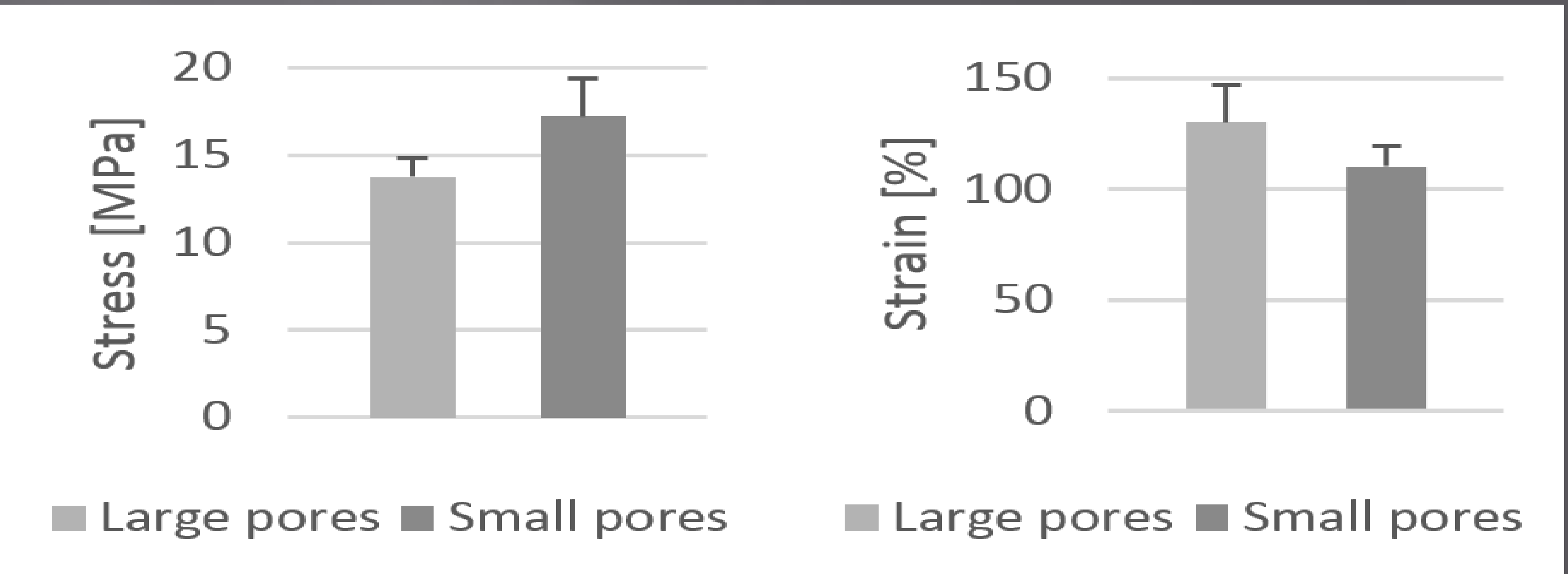


Figure 2. Average break stress (left) and strain (right) of large and small pores nylon meshes.