

A Systematic Review Examining the Experimental methodology behind in vivo testing of hiatus hernia and Diaphragmatic Hernia Mesh

Authors : Whitehead-Clarke T., Beynon V., Banks J., Karanjia R., Mudera V., Windsor A., Kureshi A.

Abstract : Introduction: Mesh implants are regularly used to help repair both hiatus hernias (HH) and diaphragmatic hernias (DH). In vivo studies are used to test not only mesh safety but increasingly comparative efficacy. Our work examines the field of in vivo mesh testing for HH and DH models to establish current practices and standards. Method: This systematic review was registered with PROSPERO. Medline and Embase databases were searched for relevant in vivo studies. 44 articles were identified and underwent abstract review, where 22 were excluded. 4 further studies were excluded after full text review - leaving 18 to undergo data extraction. Results: Of 18 studies identified, 9 used an in vivo HH model and 9 a DH model. 5 studies undertook mechanical testing on tissue samples - all uniaxial in nature. Testing strip widths ranged from 1-20mm (median 3mm). Testing speeds varied from 1.5-60mm/minute. Upon histology, the most commonly assessed structural and cellular factors were neovascularization and macrophages, respectively (n=9 each). Structural analysis was mostly qualitative, where cellular analysis was equally likely to be quantitative. 11 studies assessed adhesion formation, of which 8 used one of four scoring systems. 8 studies measured mesh shrinkage. Discussion: In vivo studies assessing mesh for HH and DH repair are uncommon. Within this relatively young field, we encourage surgical and materials testing institutions to discuss its standardisation.

Keywords : hiatus, diaphragmatic, hernia, mesh, materials testing, in vivo

Conference Title : ICBMMD 2022 : International Conference on Biomedical Materials and Medical Devices

Conference Location : Paris, France

Conference Dates : February 17-18, 2022