

 SURGERY

Novel mesh materials tested

Many women require surgery for stress urinary incontinence (SUI) or pelvic organ prolapse (POP), and a substantial proportion of these women will require a repeat, or repair procedure owing to degradation of the implanted mesh material, which can also result in painful and debilitating adverse events. Now researchers have investigated the biomechanical properties of two novel electrospun mesh materials in order to determine their effectiveness as surgical implant materials.

Researchers selected a polyurethane mesh with superior resistance to mechanical strain compared with other clinically used materials, and a poly-lactic acid mesh that is designed to degrade over a 1-2 year period, to then be replaced by host-tissue growth, for further investigation. These two novel materials, in addition to the more widely used polypropylene or polyvinylidene fluoride were used to reinforce an experimentally induced abdominal wall defect in rabbits.

After an implantation period of 90 days, rabbits implanted with polyurethane or poly-lactic acid mesh materials had lower levels of sustained inflammation, as indicated by M1 macrophage levels, neovascularization and extracellular matrix production, compared with polypropylene or polyvinylidene implants. Rabbits implanted with poly-lactic acid mesh also had greater levels of constructive remodelling, as indicated by a greater M2 macrophage response.

These results suggest that use of novel electrospun materials as mesh implants might reduce the risk of complications in women undergoing SUI or POP surgery.

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ORIGINAL ARTICLE Roman S. *et al.* Evaluating alternative materials for the treatment of stress urinary incontinence and pelvic organ prolapse – a comparison of the *in vivo* response to meshes of polypropylene, polyvinylidene fluoride, poly-lactic acid and polyurethane implanted in rabbits for 3 months. *J. Urol.* <http://dx.doi.org/10.1016/j.juro.2016.02.067> (2016)