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LETTER TO THE EDITOR

The need for standardised animal models and scoring systems in assessing mesh biocompatibility

Re: Hernia repair: the search for ideal meshes, S. Bringman et al. (2010) Hernia 14:81–87

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Dear Editor,

We read with great interest the congress report on today's unmet needs for hernia repair by Bringman et al. [1], summarising a roundtable discussion during the 30th International Congress of the European Hernia Society. The report constitutes an extensive overview of current evidence and beliefs regarding the—yet to find—ideal meshes.

The authors state that the intended function of a mesh is to repair a hernia without giving rise to recurrences, pain, infection, foreign body sensation, stiffness or delayed return to normal activity. This description actually addresses the term 'biocompatibility,' which includes both a device's ability to perform its intended function, as well as the absence of any undesirable local or systemic effect in the host [2]. In addition, biocompatibility is a contextual term implying that the specific situation (i.e. placement technique, location of the mesh, patient factors) is of great importance too. Thus, the term biocompatibility is all-embracing, characterising the net result of mesh implantation. In order to improve the understanding and uniformity of this concept, it should, therefore, be used accordingly and not to indicate only a part of the many factors involved in mesh biocompatibility [3].

Bringman et al. identify pore size as a major contributor to the biocompatibility of current prosthetic meshes. Considering two meshes of the same material, the amount of material varies inversely with larger pore size. This influences greatly the extent to which material characteristics such as surface variables and degradation products can act on the surrounding tissue. However, pore size also relates to the strength of the mesh itself and the number of anchorage points available for incorporation and force distribution, which are important in recurrence prevention. Yet, classifying meshes solely on their pore size seems inappropriate, as the materials of which the mesh is constituted are of influence as well. Especially towards a future with new materials and coatings, possibly enriched with bioactive substances (e.g. chemokines, antibiotics), the pore size alone will not tell the full story.

The best way for testing biocompatibility is in performing clinical studies. Nevertheless, considering the limitations associated with clinical studies, preclinical animal studies are advisable. Unfortunately, current animal models vary widely, as do the scoring systems in both animal and clinical studies. This illustrates that defining standards has to be a top priority in order to improve clinical relevance, efficiency and comparability among different study results. Furthermore, comparing meshes that are identical in all but one characteristic can greatly improve our understandings of relevant characteristics. Yet, it also demands a commitment from industry, as commercially available meshes typically vary in more than one characteristic and the required custom-made meshes can be out of scope for many research centres.

We want to congratulate the authors with their efforts for bringing together such a large quantity of data. It is clear that there is still a lot of research to be conducted. We believe that setting standards for research models and scoring systems in hernia research has to be a joint effort with top priority.

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