P042 CHARACTERIZATION OF INNATE AND ADAPTIVE IMMUNE CELLS INVOLVED IN THE FOREIGN BODY REACTION TO POLYPROPYLENE MESHES IN THE HUMAN ABDOMEN

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Aim: Polypropylene (PP) mesh is widely used to reinforce tissues. The foreign body reaction (FBR) to the implant is dominated by innate immune cells, especially macrophages. However, considerable numbers of adaptive immune cells have also been regularly observed, which appear to play a crucial role in the long-term host response. This study investigated the FBR to seven human PP meshes, which were removed from the abdomen for recurrence after a median of one year.

Material and Methods: Using immunofluorescence microscopy and distance maps, the FBR was spatially analyzed for various innate (e.g., CD68+ macrophages, CD56+ NK) and adaptive immune cells (CD3+ T, CD4+ T-helper, CD8+ cytotoxic, FoxP3+ T-regulatory, CD20+ B) as well as “conventional” immune cells (defined as cells expressing their specific immune cell marker without co-expressing CD68).

Results: T-helper cells (19%) and regulatory T-cells (25%) were present at comparable rates to macrophages, and clustered significantly toward the mesh fibers. For all cell types the lowest proportions of “conventional” cells (< 60%) were observed at the mesh-tissue interface, but increased considerably at about 50–100 μm, indicating reduced stimulation with rising distance to the mesh fibers.

Conclusions: Both innate and adaptive immune cells participate in the chronic FBR to PP meshes with T cells and macrophages being the predominant cell types, respectively. Furthermore, many cells present a “hybrid” pattern near the mesh fibers. The complexity of the local immune reaction may explain why approaches focusing on specific cell types have not been very successful in reducing the chronic FBR.