

Human Immune Response to Surgery: The Surrogate Prediction of Postoperative Outcomes

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Abstract : Immune responses following surgical trauma play a pivotal role in predicting postoperative outcomes from healing and recovery to postoperative complications. Postoperative complications, including infections and protracted recovery, occur in a significant number of about 300 million surgeries performed annually worldwide. Complications cause personal suffering along with a significant economic burden on the healthcare system in any community. The accurate prediction of postoperative complications and patient-targeted interventions for their prevention remain major clinical provocations. Recent Findings: Recent studies are focusing on immune dysregulation mechanisms that occur in response to surgical trauma as a key determinant of postoperative complications. Antecedent studies mainly were plunging into the detection of inflammatory plasma markers, which facilitate in providing important clues regarding their pathogenesis. However, recent Single-cell technologies, such as mass cytometry or single-cell RNA sequencing, have markedly enhanced our ability to understand the immunological basis of postoperative immunological trauma complications and to identify their prognostic biological signatures. Summary: The advent of proteomic technologies has significantly advanced our ability to predict the risk of postoperative complications. Multiomic modeling of patients' immune states holds promise for the discovery of preoperative predictive biomarkers and providing patients and surgeons with information to improve surgical outcomes. However, more studies are required to accurately predict the risk of postoperative complications in individual patients.

Keywords : immune dysregulation, postoperative complications, surgical trauma, flow cytometry

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