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Early prediction of anastomotic leakage after colorectal surgery by measuring peritoneal cytokines: Prospective study

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ABSTRACT

Background: Anastomotic leakage (AL) is a major cause of postoperative mortality and morbidity in colorectal surgery. We investigated the early prediction of peritoneal cytokine levels in developing AL after colorectal surgery.

Methods: Thirty-four patients with colorectal carcinoma, who underwent elective surgery, were included prospectively. Peritoneal samples were collected on the fifth postoperative day and interleukin (IL)-6, IL-10 and tumor necrosis factor- α were measured. Patients were divided into two groups: those with clinical evidence of AL (group 1) and those without any evidence of AL (group 2).

Results: Of the 34 patients undergoing anastomoses, clinically evident AL occurred in 4 patients (11.7%). There was a positive correlation between AL and peritoneal cytokine levels and blood loss and operation time and hospital stay. Peritoneal cytokine levels were significantly higher in group 1 as compared to group 2. The significant increase in patients with AL was observed between peritoneal cytokine levels and the postoperative days. However, a significant decrease in patients without AL was observed.

Conclusion: The peritoneal cytokine levels can be an additional diagnostic tool that can support the early prediction of AL in colorectal surgery.

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1. Introduction

Despite improvements in surgical technique and perioperative preparation, colorectal surgery is associated with a 5% mortality rate and a morbidity rate of 20–40%.^{1–7} Blood supply of the anastomotic edges, the level of the anastomosis, use of staples, adverse effect during operation, lack of bowel preparation and prophylactic antibiotic therapy, blood loss and blood transfusions during operation, and patient-related risk factors have been associated with a higher risk of anastomotic leaking.^{8–14}

Early relaparotomy and draining are the most important salvage therapies in the secondary peritonitis due to anastomotic complications¹⁵; however, the exact laboratory biomarkers of early prediction complications are unclear.

Several studies have demonstrated a significant systemic inflammatory host response in surgical patients with secondary peritonitis identified by the systemic release of proinflammatory cytokines^{16,19}; however, the local cytokine response in the colorectal surgery is unclear. Recent reports investigated the local release of peritoneal cytokines in patients after colorectal surgery during the

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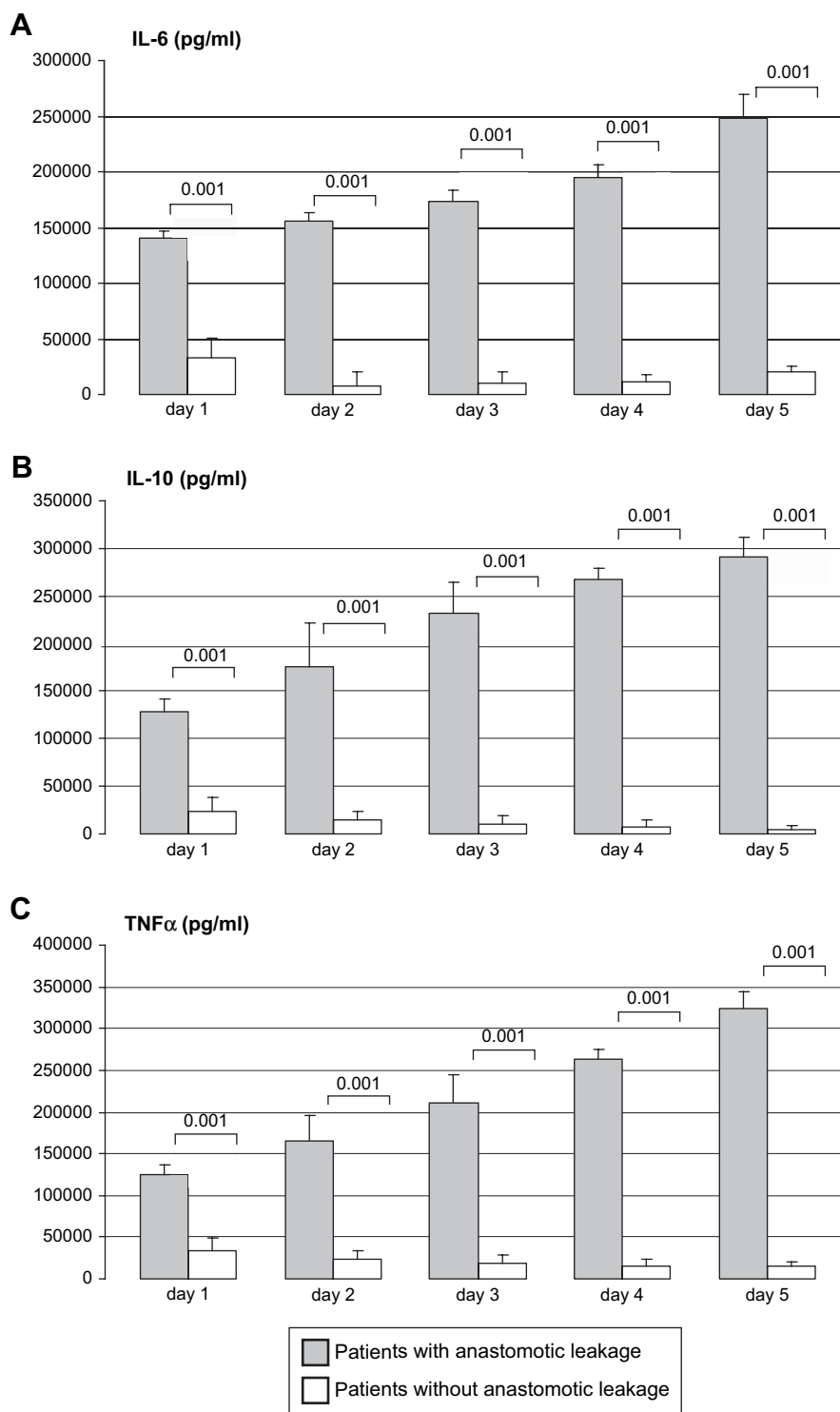


Fig. 1 – Comparison of peritoneal cytokines between groups 1 and 2.

early postoperative period to evaluate whether it may serve as an indicator of evolving anastomotic complications. The increase in peritoneal cytokines can predict anastomotic complications.^{20–26}

The purpose of this study was to prospectively investigate the correlation between levels of peritoneal cytokines and anastomotic leakage and early prediction of complications in patients undergoing colorectal surgery.

2. Materials and methods

2.1. Patients

In the Department of Surgery, Istanbul Faculty of Medicine, 34 patients with colorectal carcinoma, who underwent elective surgery from January 2005 to December 2005, were

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