When do Anastomotic Leaks Occur After Laparoscopic Total Colectomy and Ileo-rectal Anastomosis? A Case-Controlled Study in Patients with Familial Adenomatous Polyposis

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Aims: Prophylactic laparoscopic total colectomy with ileorectal anastomosis (IRA) is a means of managing appropriate Familial Adenomatous Polyposis (FAP) patients. Avoidance of an ileostomy is important for these patients, but reported anastomotic leak rates range from 5–23%. This study aims to determine which parameters best predict these leaks and determine their timing.

Methods: A prospectively collected database was used to identify FAP patients undergoing IRAs between 2006–2013. Each leak was matched with 2 non-leaks (consecutive patients before and after). Panel data was collected as repeated measures of continuous post-operative physiological, biochemical, and observational parameters over time. Data were organized into long format where each observation is an individual-time pair. Panel time-series regression was performed using a double subscript structure. A generalized least squares multivariate approach was applied in a random effects setting to calculate correlations for observations with the dependent outcome of anastomotic leak. Regression calculations were performed according to individual observations at each recorded time to identify outcome correlations at specific time points.

Results: From 117 patients, a total of 30 were included in this study (10 IRA leaks and 20 IRA controls). The mean age was 31.9 (+/−17.0) years with groups matched for age, sex, ASA grade, physiology, and operative score. Multivariate analysis showed a significant correlation between heart rate (day 1.5), respiratory rate (day 1), diastolic blood pressure (day 1.5), and urine output (day 1.25). Biochemical parameters (including white cell count, neutrophil count, platelets, albumin, and c-reactive protein) did not show correlation. The observational parameters, oral fluid intake (day 1.5) and vomiting (day 7.5) correlated with leaks but stool frequency or volume did not.

Conclusions: Physiological parameters most strongly correlated with anastomotic leaks within the first two post-operative days. This suggests they occurred early and were detected much later. Earlier re-intervention in these patients may salvage the anastomosis and reduce morbidity.