Colectomy: Procedures, Complications, and Nutritional Implications

Clifford Y. Ko, MD, MS, MSHS, FACS, FASCRS

Colectomies involve a surgical resection of the colon. Three aims are presented in this summary. First, to describe the anatomy, common colon operations, and indications for surgery; second, to discuss complications associated with colon operations; and third, to discuss the direct and indirect nutritional implications associated with colon surgery.

The intestine is sectioned into upper and lower tracts, with the lower tract identified as the lower gastrointestinal (GI) tract, or large intestine. The large intestine is divided into the colon, rectum, and anus. The border between the small and large intestine is the ileocecal valve, where the ileum (the most distal part of the small intestine) connects to the most proximal part of the large intestine, also known as the cecum. Parenthetically, the appendix is located as an appendage at the base of the cecum. After the cecum, the colon is commonly divided into the ascending colon, the hepatic flexure, the transverse colon, the splenic flexure, the descending colon, and sigmoid colon. The rectum and anus follow the sigmoid colon, with the endpoints of the large intestine serving as a conduit and reservoir, and area of defecation, respectively.

Many colon and rectal “resections” are performed in surgery, and often are described by the anatomic part of the large intestine that is being removed – eg, ileo-cecectomy involves resection of the distal portion of the ileum and the cecum with removal of the ileocecal valve. A sigmoid colectomy involves removal of the sigmoid colon. When a portion of the large intestine is removed, the most commonly performed “reconstruction” is to join the two pieces together to restore bowel continuity (ie, with an anastomosis). Depending on the location of the anastomosis and other factors (such as nutritional status), a proximal diversion may be performed, commonly known as an ostomy. Patients often refer to their ostomy as a “bag” or “stoma”. Depending on the site of the ostomy and if the ileocecal valve is removed, issues with hydration, nutrition, and other complications may exist.

The many reasons for resecting the large intestine are beyond the scope of this review. It should be recognized that the disease process, malignant or benign, influences the location and amount of resection. Within each of these distinctions, there are different stages usually aligning with the severity of the disease process. Finally, patient factors such as comorbidities (eg, diabetes) and nutritional status can also play a role in the location and amount of resection.

When we think of results or outcomes of a procedure, one primary focus is the outcome of the disease process. For example, the outcome of the disease process involves assessment for cancer cure, or relief of symptoms, eg, pain. Complications or occurrences are other outcomes of importance to the surgeon and healthcare organization. Occurrences can be categorized in numerous ways. Some of the more common occurrences include infection, dehydration, anatomic/mechanical complications, patient-reported outcomes/issues, increased resource use (eg, readmission, reoperation, length of stay), and nutritional issues.

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The American College of Surgeons (ACS) has one of the best and most accurate clinical data registries in surgery known as the National Surgical Quality Improvement Program (ACS NSQIP). The ACS NSQIP Risk Calculator was developed from data in this registry. This tool estimates a patient's risk for complications using information about the procedure and patient factors. The ACS NSQIP Risk Calculator is available on the American College of Surgeons website (www.facs.org).[1]

In the current healthcare environment, value is an increasingly important priority. In this regard for surgical operations, the outcome is one part of the value equation, with the other part being the economic impact. The economic part of the equation is measured in several ways, with "resource use" often measured. A common resource metric in surgical operations is length of stay – a longer length of stay increases resource use. A study published in 2009 found that hospitals performing colon operations have great variability in terms of length of stay, even when patient factors are accounted for.[2] Today the results from these analyses are unchanged – with variability in terms of length of stay for colectomy, and looking only at patients who have no complications.

What is interesting from these types of analyses for length of stay is that the median length of stay remains about 7 days for colectomy.[2] Of concern is that a patient will often remain without adequate nutrition support for 5-6 days or even longer. Food intake is often very limited following a colon operation, and through the early stages of recovery.

Several studies have examined nutritional issues in colon surgery. Montomoli et al[3] addressed the impact of preoperative serum albumin on 30-day mortality following colorectal cancer surgery. This population-based cohort study (Denmark) found that 12% of patients undergoing colorectal operations are hypoalbuminemic. The risk of hypoalbuminemia is higher if the operation is non-elective, or the cancer stage is advanced. 30-day mortality increased from 4.9% among patients with albumin level 36-40 g/L to 26.9% among patients with albumin $\leq$ 25 g/L, compared to 2% among patients with albumin above 40 g/L (Figure).

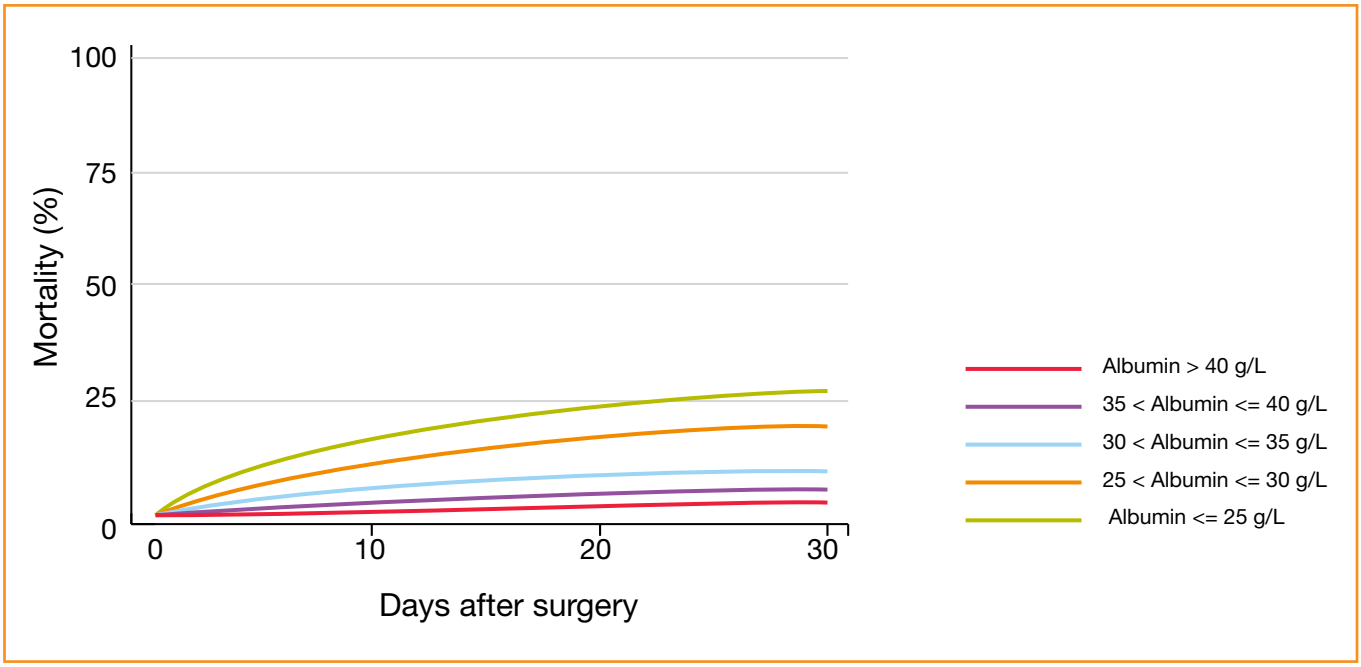

Figure. Crude 30-day mortality curves for patients undergoing surgery for colorectal cancer according to preoperative serum albumin concentration.[3]
Source: Montomoli J et al. Impact of preoperative serum albumin on 30-day mortality following surgery for colorectal cancer: a population-based cohort study. *BMJ Open Gastroenterol*. 2015; 2(1): e000047. doi: 10.1136/bmjgast-2015-000047.

Frasson et al[4] and Telem et al[5] identified the possible association of lower albumin levels and occurrences, including anastomotic leak and 30-day mortality. While these studies have some methodological limitations, there are trends and associations of low albumin and anastomotic leak and mortality. This is important because while disease processes may or may not be mutable, the issue of malnutrition can be addressed.

After a routine colorectal operation, most patients lose approximately 15 pounds of weight. This weight loss from nutritional and hydration deficits is often a potentially important issue given postoperative healing substantially occurs in this time period. This may be at least part of the reason why hypoalbuminemia has been found to be associated with unfavorable occurrences. Although imperfect, using albumin as a marker has shown trends and is still often used to assess risk.

There is little information in the peer-reviewed published literature on patient dietary intake and food-related symptoms following colorectal operations, especially in the period after hospital discharge. With social media and public patient blogs, it is enlightening to review the patient's perspective on food tolerances, dietary progression, and intestinal/ostomy issues in the care continuum following hospital discharge after a colorectal operation.

More information and evidence-based practice guidelines are needed to address the impact of preoperative and postoperative nutrition interventions on colorectal surgery outcomes.

References

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