

Identifying Candidates for Early Discharge After Gastrectomy: “It’s Tough to Make Predictions, Especially About the Future”

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The duration of postoperative hospitalization has traditionally been much longer in Korea and Japan than in the West due to both cultural differences and health care systems in the East that allow patients to stay in the hospital longer with less financial impact. Indeed, the reported median hospital stay after gastrectomy for gastric cancer in most series from Korea and Japan is about 9–13 days, and this despite the fact that the majority of gastrectomies currently performed in the East are laparoscopic distal gastrectomies for early gastric cancer.

Recently, however, with the rising popularity of fast-track surgery and enhanced recovery pathways after surgery, both the East and the West are experiencing significant momentum to identify those patients who would be good candidates for early discharge after gastrectomy. On the one hand, shorter postoperative stays can lead to substantial cost savings and improved patient satisfaction. On the other hand, early discharge may put the patient at risk for delayed diagnosis and treatment of postdischarge complications as well as for readmission to the hospital.

The early postdischarge period is a vulnerable time for surgical patients, during which they are at substantial risk for complications and readmissions.¹ Moreover, it is known that most readmissions after surgery are associated with new postdischarge complications related to the procedure as opposed to exacerbation of a prior index hospitalization complication.² Even expert laparoscopic gastric cancer surgeons in Korea and Japan experience postoperative morbidity rates of about 15–25 %, and the

mean time to the development of a complication after discharge from the index hospitalization is 9.5 days.¹

Although readmission rates after gastrectomy for gastric cancer in the East tend to be low (~3–5 %), we recently reported a nearly 15 % rate of readmission after gastrectomy at our center in the United States after a median hospital stay of 9 days.³ There are legitimate concerns that shortening the stay during the index hospitalization may potentially lead to higher rates of readmission and greater severity of postdischarge complications. Thus, the decision to discharge a patient early after a gastrectomy, or after any surgical procedure for that matter, should ideally be based on as accurate an assessment of the patient’s risk for a postdischarge complication (and thus of potential readmission to the hospital) as possible. Furthermore, appropriate discharge plans including patient education, outpatient monitoring, and the provision of home health services should be in place to ensure a safe, early hospital discharge.

Previous investigators have examined various measures of systemic inflammation, such as C-reactive protein (CRP), procalcitonin, and the white blood cell count (WBC) as markers of postoperative infectious complications after colorectal and gastric surgery, to identify which patients are at low risk for an infectious complication and thus can be safely discharged.^{4–9} As a type of acute-phase protein with a short half-life (~19 h), CRP functions as an early defense against infection in innate immunity. Several groups have reported that high CRP levels on postoperative day (POD) 3 or 4 show superior diagnostic accuracy for the prediction of postoperative complications after gastrectomy.^{4, 8} Others have devised a CRP-based nomogram incorporating the CRP level on POD 3, patient comorbidities, Eastern Cooperative Oncology Group (ECOG) performance status, and operative time to predict a patient’s risk for a major complication after laparoscopic

gastrectomy.⁹ What these studies (and many similar studies) share in common is the use of either a single laboratory value or some combination of laboratory and clinical variables designed to predict a complicated postoperative course.

In this issue of the *Annals of Surgical Oncology*, Park and colleagues at Seoul National University Hospital take a slightly different tack in that they seek to determine those clinical and laboratory factors predicting an uncomplicated postoperative course in order to identify those patients who might be candidates for a successful, early hospital discharge.¹⁰ In a study cohort of 855 patients, they identified three clinical variables (age >68 years, open gastrectomy, and combined resection) and three laboratory variables (preoperative WBC ratio on POD 5, CRP level on POD 5, and maximum body temperature on POD 4) as independent predictors of any postoperative complication occurring within 30 days after surgery. Based on these six variables, they established an early discharge profile (EDP), which they subsequently validated with another 217 patients. Although their EDP has nearly a 95 % sensitivity for identifying patients who are unlikely to experience a postoperative complication (and thus would seem to be good candidates for discharge as early as POD 5), the specificity rate of approximately 25–30 % of this profile is extremely low. Moreover, the diagnostic accuracy of this profile for predicting complications as measured by the area under the curve (AUC) is only in the range of 60–70 %, which I consider modest at best. As a result of this profile's low specificity, more than 75 % of the patients said to have a negative EDP and thus deemed to be at high risk of a complication and presumably poor candidates for early discharge had perfectly uncomplicated postoperative courses and could easily have been discharged as soon as those who achieved a positive EDP. Of course, a trade-off always exists between the sensitivity and specificity of any diagnostic test, but for a profile as complicated as this one with six distinct variables, I would expect to see a much higher specificity rate together with the high sensitivity rate for optimization of its clinical utility.

In addition to the concerns about the accuracy (and thus the utility) of this profile, the question also could be raised whether developing a tool to assess the risk for a complicated or uncomplicated postoperative course is the best way to predict the safety of early discharge, especially because the timing of the postoperative complications was not defined in this study. For example, how is it that a simple wound or urinary tract infection, identified and appropriately treated on POD 3 in the hospital (or on POD 14 in the outpatient clinic), would preclude safe, early discharge? Furthermore, why

would a late complication, such as a stricture at the esophagojejunal anastomosis or an adhesive small bowel obstruction discovered on POD 28, preclude safe, early discharge? The risk of early discharge is not the simple fact that a patient experiences a complication at some point in the conventional 30-day postoperative period, most of which (103/180 patients, 57 %) have occurred before POD 5 in this study (i.e., while the subject was still an inpatient). Rather, it is the potential for a delay in the recognition of a potentially serious complication that occurs during the postdischarge period, understanding that most of these complications are new, previously unrecognized complications that occur at unpredictable intervals after discharge from the hospital and lead to the vast majority of readmissions to the hospital.

Although Park and colleagues are to be congratulated for their contribution to the literature, it is just a small step forward in the complicated science of prediction within the field of surgery. I encourage future investigators to develop a simpler, more clinically useful tool that predicts postdischarge complications prompting readmission to the hospital or resulting in serious morbidity. After all, these are the harmful, costly events that we want to predict and thus hopefully to prevent, understanding (just as the infamous Yogi Berra said) that “it's tough to make predictions, especially about the future.”

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