Patient Perception of a Clinical Pathway for Laparoscopic Foregut Surgery

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Clinical pathways have been implemented for a number of surgical procedures, yet few data are available that explore the patients' perception of these changes in clinical practice. A clinical pathway was developed for laparoscopic fundoplication, Heller myotomy, and paraesophageal hernia repair. Data collected from a cohort of patients undergoing surgery with the pathway over a 12-month period was compared with a group of patients operated on in the 12 months prior to pathway implementation. A questionnaire examining patient-based outcomes and perceptions was completed 6 weeks after surgery. From November 2001 through November 2003, 49 patients underwent primary laparoscopic foregut surgery, 27 before and 22 after pathway implementation. There were no differences in age, gender, procedure, or ASA Class. Parenteral opioid use diminished significantly without compromising the patients' perceived pain control. The number of patients undergoing postoperative investigations diminished, as did length of stay. Of the 20 postpathway patients completing satisfaction questionnaires, 95% were satisfied or very satisfied with their care during admission. Pathway implementation resulted in a significant reduction in direct postoperative hospital costs. A clinical pathway for laparoscopic foregut surgery was successfully implemented in a single-payer system, resulting in decreased utilization of hospital resources while maintaining high patient satisfaction. (J GASTROINTEST SURG 2006;10:878–882)

KEY WORDS: Clinical pathway, laparoscopy, fundoplication, hiatal hernia, achalasia, myotomy, esophageal surgery

The prevalence of managed care in the United States and limited health care dollars in single-payer systems such as in Canada have provided incentive for identifying methods to reduce costs. Clinical pathways have been demonstrated as effective cost-containment measures for a variety of conditions and operative procedures.[1–4] However, few studies have examined the impact of clinical pathways in laparoscopic hiatal surgery or assessed the patient perception of these protocols. In addition, little data exist on the benefit of clinical pathways on health care resource utilization in a single-payer system.

Length of stay after laparoscopic hiatal surgery (Nissen fundoplication, Heller myotomy, paraesophageal hernia repair) ranges from 2 to 5 days depending on the specific procedure, the surgical practice and local norms, and the health care system.[5–10] Therefore, given this relatively short postoperative period, the opportunity for further reduction in length of stay in these cases is limited. Nonetheless, we believed that a standardized approach to the postoperative care for patients undergoing laparoscopic hiatal surgery could further improve these outcomes. We sought to determine the impact of a clinical pathway on laparoscopic surgery for achalasia, gastroesophageal reflux disease, and paraesophageal hernias from the patients' perspective.

METHODS

A clinical pathway was developed for all patients undergoing laparoscopic hiatal surgery including Heller myotomy, Nissen fundoplication, and paraesophageal repair. In its design, input was obtained from surgeons, nurses, dietitians, pharmacists, and anesthetists. The clinical pathway outlined

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all preoperative, immediate postoperative, and discharge care from a nursing, activity, medication, diet, and medical intervention perspective. Nursing instructions involved preoperative teaching and postoperative care. All postoperative investigations (e.g., chest or contrast radiography, laboratory investigations) were omitted unless the patient clinical status deviated significantly from the expected postoperative course. Analgesia was controlled primarily with acetaminophen and nonsteroidal anti-inflammatory agents (NSAIDs), with a significant reduction of opioids. Patients were allowed sips of water immediately postoperatively, and a liquid diet was started on the first postoperative day, after instructions on a posthiatal surgery diet provided by the ward nutritionist. Ambulation was required on the evening of surgery and most patients were expected to meet discharge criteria (absence of fever, control of pain with oral analgesics, and ability to tolerate liquid oral intake) by the afternoon of the first postoperative day. All members of the treating team were educated about the pathway at informal sessions on participating clinical units.

The pathway was implemented November 2000 and applied to all patients undergoing primary laparoscopic foregut surgery. Patients undergoing reoperative surgery were excluded. The cohort of patients operated over a 12-month period under the clinical pathway was compared with those who had undergone laparoscopic foregut surgery in the 12-month period immediately prior to clinical pathway implementation. Patient characteristics, postoperative course (complications, length of stay, opioid use), resource utilization (investigations, postoperative direct hospital cost), and quality of life (Short Form-12 Mental and Physical) were prospectively collected in the postimplementation group and compared with outcomes in the preimplementation group. Readmissions and reasons for deviation from the pathway were also documented. A questionnaire examining patient-based outcomes and perceptions (satisfaction, pain control, timing of discharge from hospital) was completed 6 weeks after surgery in the postimplementation group. Direct hospital costs were compiled for both study groups. Given that the primary goal of the clinical pathway is to impact the postoperative course, only direct costs in this period (nursing, investigation, and hotel costs) were analyzed. Data are presented as mean ± standard error of the mean, or median (range). The two groups were analyzed and compared using Student's *t*-test or χ^2 test. Differences with a *P*-value of ≤ 0.05 were considered to be significant.

RESULTS

From November 2001 to November 2003, a total of 55 patients underwent laparoscopic foregut surgery (Heller myotomy, Nissen fundoplication, or paraesophageal hernia repair). Of these, six had undergone prior open or laparoscopic foregut surgery and were not included in the study. Therefore, 49 patients were assessed, 27 before and 22 after implementation of the clinical pathway. Patient characteristics are displayed in Table 1. There was a slight trend for more advanced age and significantly more male patients in those being managed by the clinical pathway. Surgery for paraesophageal hernia repair represented 30% of cases in the prepathway group and 45% in the postpathway group (NS).

A significant reduction in length of stay (from 2.7 to 1.6 days) was achieved after implementation of the clinical pathway. Standardized postoperative orders also resulted in a substantial reduction in the use of parenteral opioids (from 36 to 7.5 mg morphine equivalents) (Table 2). One patient was readmitted in the prepathway group for severe dysphagia. No patients required readmission after introduction of the clinical pathway. Although more postoperative complications occurred in the prepathway cohort, the difference was not significant and the complications were generally minor (Clavien Classes I and II).

The majority (18 of 27) of the prepathway cohort had some postoperative investigation. These were mostly laboratory tests including complete blood count (14 of 27) and electrolytes/renal function tests (11 of 27), usually performed in the postanesthesia care unit and on the first postoperative day. Radiographic tests were performed in nine prepathway patients (four chest radiographs and five contrast studies). Conversely, only five (23%) of the postpathway patients had received postoperative investigations ($P < 0.05$). These included two chest radiographs and three blood tests (complete blood

Table 1. Characteristics of patients undergoing laparoscopic foregut surgery prior to and after clinical pathway implementation

	Prepathway	Postpathway	*P*-value
Number	27	22	
Age, median y (range)	53 (23–84)	58 (30–77)	0.56
Gender (% male)	11 (41%)	15 (68%)	0.06
ASA>2 (%)	6 (22%)	5 (23%)	0.92
Procedure			
Fundoplication	10	6	
Heller myotomy	9	6	
PEH repair	8	10	0.51