Impact of a Clinical Pathway and Standardization of Treatment for Acute Appendicitis

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Abstract

Purpose. Acute appendicitis is one of the most common surgical diseases. Simple and precise guidelines for treating acute appendicitis are necessary for improving the treatment outcome of this disease. The purpose of this study was to determine the impact of a clinical pathway and standardization of treatment for acute appendicitis at our hospital.

Methods. The clinical pathway and standardization of treatment for acute appendicitis were introduced to our hospital in January 2000. We compared the length of hospitalization, postoperative stay, hospital costs, and operation time during the years before and the years after their introduction.

Results. There was no significant difference in the clinical characteristics of the 73 patients in the control group and the 112 patients in the pathway group. There were 6 (8.2%) and 24 (21.4%) cases of perforated appendicitis in the respective groups. The mean length of hospitalization (P < 0.001), postoperative stay (P < 0.001), and hospital costs (P < 0.01) were significantly less in the patients in the pathway group who underwent surgery.

Conclusion. Our clinical pathway and standardization of treatment for acute appendicitis proved effective for treating patients with acute appendicitis and minimizing costs without compromising patient care.

Key words Acute appendicitis · Clinical pathway · Standardization · Treatment

Introduction

The clinical pathway is a financial management system that was developed in the United States under the Diagnosis Related Group (DRG) and the Prospective Payment Healthcare System (PPS). The clinical pathway originally aimed to shorten the hospital stay and reduce healthcare costs, which has become an increasingly important issue in medicine. In Japan, it is also used for the standardization of medical care and to increase patient satisfaction with medical treatment.

Generally speaking, the clinical pathway and standardizing the treatment protocol for acute appendicitis is thought to be difficult to adopt because this disease shows various clinical patterns according to the degree of inflammation. Its diagnosis is sometimes difficult even for an experienced doctor when, because of disease progression, the classical clinical picture is absent and surgical decision-making poses a challenge. Delay in diagnosis and timing of surgery may further complicate the course of the disease,1 which will result in a longer hospital stay and high hospital costs in some cases. However, acute appendicitis is one of most common surgical diseases and therefore, a simple and precise medical protocol with a clinical pathway are necessary to improve the treatment outcome and patient satisfaction.2 The purpose of this study was to determine the effect of the clinical pathway and standardization of treatment for acute appendicitis at our hospital.

Materials and Methods

Preoperative Assessment

Until recently, there was no standardized treatment protocol for acute appendicitis at our hospital. Doctors made independent decisions about ordering
ultrasonographic and radiological investigations, making the diagnosis of acute appendicitis, and deciding on the indications for surgery, timing of oral intake, and day of discharge.

We retrospectively reviewed the records of patients admitted to Kikkoman General Hospital with acute appendicitis between January 1998 and December 1999, just before the standardization of treatment with a clinical pathway for acute appendicitis was introduced to our hospital. Since January 2000, all patients admitted for acute appendicitis have been examined by at least two doctors and treated according to our treatment protocol.

All patients who met two or more of the following criteria were informed about the trial. The criteria were: a diagnosis of appendicitis confirmed by physical examination by at least two doctors; subjective symptoms, such as lower quadrant pain, pain moving from the epigastric region to the lower quadrant, or increased pain on walking; and an elevated white blood cell count, C-reactive protein level, or body temperature.

Abdominal ultrasound, computed tomography, and gynecologic examination were also done when it was difficult to rule out other diseases such as diverticulitis, enterocolitis, or ovarian tumor. All patients were fully informed and those who gave consent underwent surgery after a dose of intravenous antibiotics. As conservative therapy, patients were treated with intravenous antibiotics and fluids and fasted. They resumed oral intake after their clinical signs and laboratory findings improved. Patients who did not improve with conservative therapy underwent surgery after consent was obtained.

Postoperative Pathway

All patients were given two doses of intravenous antibiotics postoperatively followed by 3 days of oral antibiotics. Abdominal X-ray was done and oral intake was started on the day after the operation. Patients without drains were allowed to shower. Blood tests were done if the body temperature was higher than 37.5°C on the third postoperative day. Further examinations were done if necessary on a case-by-case basis. When the patient was free of fever and if there was no more pus-like discharge, closed drainage tubes were removed by 2 cm each day and the Penrose drain was removed at once.

Patients were discharged from hospital after meeting all of the following criteria: a body temperature lower than 37.5°C for 24 h; they had passed stools or flatus; they were tolerating clear liquids and a regular diet; there were no drains in situ; and there was no spinal anesthesia-associated headache. Patients who were treated by conservative therapy were discharged after meeting criteria 1–3.

Patients and Methods

The outcome after introducing this clinical pathway and standardized treatment protocol was investigated. Clinical data were prospectively recorded from patients who were admitted to Kikkoman General Hospital for acute appendicitis between January 2000 and December 2001. The results were compared with historical data of patients who were admitted to Kikkoman General Hospital for acute appendicitis between January 1998 and December 1999, and not cared for according to the pathway.

Patients in both periods were divided into a conservative group and an operation group. The operation group was divided into two subgroups: those with perforation or abscess and those without perforation or abscess. The total length of hospitalization, postoperative stay, hospital costs, and operation times were compared among the groups. Patients without perforation, but who were hospitalized for treatment, namely, the conservative group and the operation group without perforation, were compared to examine the validity of our clinical pathway and standardized treatment.

Statistics

Values are expressed as mean ± SD. Statistical analysis was performed using the unpaired Student’s t-test. A P value of less than 0.01 was considered to be significant.