



Available online at
ScienceDirect
www.sciencedirect.com

Elsevier Masson France
EM|consulte
www.em-consulte.com/en



ORIGINAL ARTICLE

Should CT scan be performed when CRP is elevated after colorectal surgery? Results from the inflammatory markers after colorectal surgery study



S. Holl^a, I. Fournel^b, D. Orry^c, O. Facy^{a,d},
N. Cheynet^a, P. Rat^{a,d}, P. Ortega-Deballon^{a,d,*}

^a Service de chirurgie générale, digestive, oncologique et d'urgences, CHU de Dijon, 21079 Dijon, France

^b Centre d'investigation clinique, CIC 1432, CHU de Dijon, Dijon, France

^c Service de chirurgie oncologique, centre de lutte contre le cancer « G.-F.-Leclerc », Dijon, France

^d Centre de recherche Inserm 866, UFR Sciences de Santé, université de Bourgogne-Franche-Comté, Dijon, France

Available online 15 November 2016

KEYWORDS

Anastomotic leak;
Intra-abdominal
infection;
C-reactive protein;
Surgical site
infection;
Abdominal
computerized
tomography;
CT

Summary

Introduction: Serum concentration of C-reactive protein (CRP) that exceeds a pre-defined threshold between the 3rd and 5th postoperative day is a reliable marker of infectious complications after colorectal surgery. However, the optimal strategy to follow when a high CRP is found has not been defined. The aim of this study was to analyze the usefulness of computed tomography (CT) scan in this situation in a prospective cohort of patients following colorectal surgery.

Methods: Between November 2011 and April 2015, patients at two surgical centers who had undergone elective colorectal resection with anastomosis and who had a CRP > 12.5 mg/dL on the 4th postoperative day (POD) were prospectively included in a database. Data were collected concerning all complications occurring during the 30 days following surgery, method of diagnosis, management and clinical course. The decision to perform a CT scan between POD 4 and POD 6 day was guided only by the elevation of CRP in the absence of any other clinical signs; results were analyzed to evaluate the diagnostic value of elevated CRP. Uni- and multivariable analyses were performed to identify risk factors for postoperative infection.

Results: The study included a total of 174 patients: 56 (32.1%) had a CT between POD 4 and 6, and this helped detect a postoperative complication in 55.4% of cases. Patients who did not undergo CT had lower CRP values (16.3 vs. 18.5, $P=0.02$). Among the 118 patients who did not undergo CT, 50.8% eventually developed an infectious complication. The sensitivity of CRP-guided CT was 76.7% with a negative predictive value of 78.8%.

* Corresponding author. Service de chirurgie digestive et oncologique, 14, rue Paul-Gaffarel, 21079 Dijon cedex, France. Tel.: +33 3 80 29 37 47; fax: +33 3 80 29 35 91.

E-mail address: pablo.ortega-deballon@chu-dijon.fr (P. Ortega-Deballon).

Conclusion: If an elevated CRP is found on POD 4, an abdominopelvic CT should be performed. A normal result does not formally eliminate the existence of intra-abdominal complication. A study protocol should be set up to evaluate whether systematic revisional surgery or repeat CT scan is the appropriate management if CRP in the next two days reveals persistent inflammation. © 2016 Elsevier Masson SAS. All rights reserved.

Introduction

Infectious complications occur following colorectal surgery in more than 20% of patients. Among them, intra-abdominal infection (often related to anastomotic leak [AL]) is the most common and dreaded. Its incidence following elective surgery ranges between 5 and 15% [1,2]. The occurrence of AL results in an overall morbidity of 35% and a mortality rate of 4% [2–4]. This morbidity weighs heavily on vital prognosis, functional results and oncologic results [1,5,6]. Duration and cost of hospitalization are increased. Diagnosis is typically made around POD 6–7 [7,8]. Clinical signs are inconstant and non-specific at an earlier stage. The ability to diagnose AL before the development of clinical signs would reduce morbidity and might permit conservation of the anastomosis. This is particularly important in the era of early rehabilitation after surgery (ERAS), allowing the patient to return home safely and with low risk of re-admission.

CRP has already proved its usefulness for the early detection of infection after colorectal surgery, especially for AL [9]. The CRP threshold favored by most authors is between 14 and 17 mg/dL on POD 3 and between 10 and 13 mg/dL on POD 4 [10–12]. However, management decisions based on elevated CRP levels alone are not codified. Management could range from close clinical monitoring to systematic revisional surgery, but most surgical teams would first order a CT scan, although its utility has never been confirmed in this context.

The aim of this study was to evaluate the utility of early-stage abdominopelvic CT scan when abnormally high levels of CRP after elective colorectal surgery raise the suspicion of intra-abdominal infection.

Patients and methods

Study characteristics

This is a retrospective study of prospectively collected data from the IMACORS (inflammatory markers after colorectal surgery) study involving a cohort of patients at the University Hospital and Cancer Center Georges-François-Leclerc in Dijon between November 2011 and April 2015. The IMACORS cohort was created to study the utility of inflammatory markers for the diagnosis of infectious complications following elective colorectal surgery [8]. In brief, this cohort included all patients who underwent elective colorectal surgery with anastomosis. CRP was measured daily in all patients between POD 1 and 4. Data regarding clinical monitoring of temperature, the resumption of transit, abdominal examination and production from drains when present was also recorded. All complications that occurred between surgery and POD 30 were recorded.

Inclusion criteria

For this study, only patients with CRP > 12.5 mg/dL on POD 4 and without clinical signs of intra-abdominal infection were selected. According to the IMACORS protocol, abdominopelvic CT was advised but not compulsory in such cases, and the decision was left to the surgeon's discretion.

Data collected

In addition to demographic data, the following patient-specific characteristics were recorded in order to study their relationship with the occurrence of postoperative infection: pathology indications for resection, type of resection, presence of a protective stoma, drain placement, postoperative clinical data, CRP value on POD 4 (only CRP \geq 12.5 mg/dL at POD 4 were retained), performance (or not) of CT scan between POD 4 and 6 (with or without water-soluble colonic opacification), CT results, and duration of hospitalization. All complications out to POD 30 were recorded, along with their date and method of diagnosis, and their management and clinical course.

Definitions

Characteristics of intra-abdominal infections (IAI), including AL and intra-abdominal abscess were defined according to the consensus classification of the Center for Disease Control (CDC), regardless of the patient's clinical condition and management: postoperative peritonitis, fecal drainage, presence of fluid collections or peri-anastomotic air on CT scan. Other infectious complications (surgical site infection [SSI], pneumonia, urinary tract infection, central venous catheter infection) were also recorded according to CDC definition [13].

Statistical analysis

Continuous variables were expressed as means \pm standard deviations (SD) or medians with interquartile range (IQR). Means were compared with the Student *t*-test or the Mann–Whitney test, according to whether the distribution was normal or not, respectively. Qualitative variables were expressed as percentages, and compared with the Chi² test or Fischer's exact test when the expected value was less than five. All variables associated with the use of CT with a *P* < 0.20 in bivariate analysis were entered into a logistic regression model, selected according to backward step-wise regression. The same procedure was used to identify variables associated with onset of intra-abdominal infection. For continuous variables, log-linear analysis used fractional polynomials. The threshold of statistical significance was set at *P* < 0.05 for all analyses. Sensitivity and specificity

Download English Version:

<https://daneshyari.com/en/article/5661011>

Download Persian Version:

<https://daneshyari.com/article/5661011>

[Daneshyari.com](https://daneshyari.com)