

ORIGINAL ARTICLE

The significance of underlying cardiac comorbidity on major adverse cardiac events after major liver resection

Thuy B. Tran, David J. Worhunsky, David A. Spain, Monica M. Dua, Brendan C. Visser, Jeffrey A. Norton & George A. Poultsides

Department of Surgery, Division of Surgical Oncology, Stanford University, Stanford, CA, USA

Abstract

Background: The risk of postoperative adverse events in patients with underlying cardiac disease undergoing major hepatectomy remains poorly characterized.

Methods: The NSQIP database was used to identify patients undergoing hemihepatectomy and trisectionectomy. Patient characteristics and postoperative outcomes were evaluated.

Results: From 2005 to 2012, 5227 patients underwent major hepatectomy. Of those, 289 (5.5%) had prior major cardiac disease: 5.6% angina, 3.1% congestive heart failure, 1% myocardial infarction, 54% percutaneous coronary intervention, and 46% cardiac surgery. Thirty-day mortality was higher in patients with cardiac comorbidity (6.9% vs. 3.7%, $P = 0.008$), including the incidence of postoperative cardiac arrest requiring cardiopulmonary resuscitation (3.8% vs. 1.2%, $P = 0.001$) and myocardial infarction (1.7% vs. 0.4%, $P = 0.011$). Multivariate analysis revealed that functional impairment, older age, and malnutrition, but not cardiac comorbidity, were significant predictors of 30-day mortality. However, prior percutaneous coronary intervention was independently associated with postoperative cardiac arrest (OR 2.999, $P = 0.008$).

Conclusion: While cardiac comorbidity is not a predictor of mortality after major hepatectomy, prior percutaneous coronary intervention is independently associated with postoperative cardiac arrest. Careful patient selection and preoperative optimization is fundamental in patients with prior percutaneous coronary intervention being considered for major hepatectomy as restrictive fluid management and low central venous pressure anesthesia may not be tolerated well by all patients.

Received 7 May 2016; accepted 14 June 2016

Correspondence

George A. Poultsides, Department of Surgery, Stanford University, 300 Pasteur Drive, Suite H3680D, Stanford, CA 94305, USA. Tel: +1 (650) 723 4646. Fax: +1 (650) 736 1663. E-mail: gpoultsides@stanford.edu

Introduction

Postoperative cardiovascular complications remain a significant concern in surgical patients, accounting for one-third of postoperative deaths, prolonged hospitalization, and increased medical costs.¹ Preoperative cardiac disease is a well-known risk factor associated with poor surgical outcomes following vascular^{2,3} and colorectal surgery.^{4–6} The risk of mortality increases 5-fold in patients with prior ischemic heart disease undergoing non-cardiac surgery.⁷

While advancements in surgery and anesthesia have led to a dramatic improvement in post-hepatectomy mortality from 20% to nearly 0% over the last 3 decades,^{8–10} the morbidity associated with complex liver resections remains considerable. In an Italian study evaluating 1500 consecutive patients undergoing hepatectomy, the authors observed a morbidity of 22.5%.¹¹ Similarly, a study using the American College of Surgeon National Surgical Quality Improvement Program database reported a morbidity of 22.6% within 30 days following hepatectomy and found that previous cardiac disease and chronic obstructive pulmonary disease (COPD) were the only comorbidities associated with post-hepatectomy morbidity.¹² However, the aforementioned study included patients who underwent minor hepatectomy and

Long Podium Presentation at the International Hepato-Pancreato-Biliary Association World Congress in Sao Paulo, Brazil, April 20–23, 2016.

did not specifically examine postoperative cardiac complications as an endpoint. Thus, it remains unclear how major hepatectomy can be tolerated in patients with underlying cardiac comorbidity. Given the intraoperative considerations during major liver surgery, specifically related to the need to maintain a low central venous pressure through fluid restrictive strategies and occasionally through the use of vasopressors,¹³ we sought to investigate the role of underlying cardiac comorbidity on postoperative outcomes following major hepatectomy using a large multi-institutional database.

Methods

Data source

The American College of Surgeons (ACS) National Surgical Quality Improvement Program (NSQIP) is a nationally validated, outcomes based and risk-adjusted program used to assess the quality of surgical care in participating academic and community hospitals. The ACS NSQIP database assesses preoperative risk factors, operative data, and 30-day postoperative morbidity and mortality. The ACS NSQIP Participant User File was queried to identify patients who underwent major hepatectomy from January 1, 2005 to December 31, 2012. Current procedural terminology (CPT) codes were used to determine major liver resection, including CPT codes 47122 (trisectionectomy), 47125 (total left lobectomy), or 47130 (total right lobectomy). Only index procedures with CPT codes meeting the inclusion criteria were included.

Patients were stratified based on presence or absence of cardiac co-morbidity. Cardiac co-morbidities included newly diagnosed or acute exacerbation of congestive heart failure one month prior to surgery, myocardial infarction in the 6 month period prior to surgery, previous percutaneous coronary intervention, previous major cardiac procedure, and angina within one month before surgery. Previous cardiac surgery includes coronary artery bypass graft surgery, valve replacement or repair, repair of atrial or ventricular defects, greater thoracic vessel repair, cardiac transplant, left ventricular aneurysmectomy, and insertion of left ventricular assist device. Not included are pacemaker or automatic implantable cardioverter defibrillation (AICD) insertions.

Main outcome measures

Postoperative variables analyzed include rates of 30-day mortality, return to the operating room within 30 days of index procedure, length of stay, and complications within 30 days of index procedure. Complications collected in ACS NSQIP include surgical site infection, deep incisional surgical site infection, organ space infection (i.e. intra-abdominal abscess), wound dehiscence, pneumonia, unplanned intubation, pulmonary embolism, prolonged mechanical ventilation (>48 h), stroke, coma, cardiac arrest requiring cardiopulmonary resuscitation (CPR), acute myocardial infarction either intraoperatively or within 30

days of surgery, bleeding requiring blood transfusion, deep vein thrombosis, sepsis, and acute renal failure.

Statistical analysis

Categorical variables were presented as counts (percentages) and compared using chi-square or Fisher's exact tests. Continuous variables were presented as means (standard deviation) and compared using Student t-test or Mann–Whitney test, where applicable. Univariate and multivariate logistic regressions were performed to determine factors associated with postoperative 30-day mortality and cardiac arrest requiring CPR. All statistical analyses were performed using SPSS version 22.0 (IBM, Chicago, IL, USA) and STATA version 13.1 (StataCorp, College Station, TX, USA). Statistical significance was set at $p < 0.05$.

Results

From 2005 to 2012, 5227 patients underwent major hepatectomy. Of those, 289 (5.5%) had history of major cardiac disease: 16 (5.6%) angina, 9 (3.1%) congestive heart failure, 3 (1%) myocardial infarction within 6 months prior to surgery, 156 (54%) percutaneous coronary intervention (PCI), and 132 (46%) cardiac surgery. [Table 1](#) shows the frequencies of underlying cardiac co-morbidities in the entire cohort.

Patients were stratified into two groups based on presence or absence of cardiac co-morbidity. Differences in baseline patient characteristics between the two groups are detailed in [Table 2](#). Those with underlying cardiac comorbidity tended to be older in age (mean 69 vs. 57 years, $P < 0.001$) and male (76.1% vs. 49.1%, $P < 0.001$). Patients with underlying cardiac comorbidity also had co-existing co-morbidities including diabetes, COPD, peripheral vascular disease, and prior transient ischemia accident or cerebrovascular accident. There were no differences in body mass index, smoking status, functional status, alcohol use, impaired sensorium, and preoperative sepsis.

The incidence of postoperative complications based on underlying cardiac disease is shown in [Table 3](#). The 30-day mortality (6.9% vs. 3.7%, $P = 0.008$) was significantly higher in those with underlying cardiac co-morbidity. Overall postoperative

Table 1 Frequency of preoperative cardiac co-morbidities in patient undergoing major hepatectomy

	Frequency (n, %) N = 5227
CHF	9 (0.17)
MI (within 6 months prior to surgery)	3 (0.08)
Prior PCI	156 (3.96)
PCS	142 (3.6)
Angina	16 (0.41)

Abbreviation: CHF, congestive heart failure; MI, myocardial infarction; PCI, percutaneous coronary intervention; PCS, prior cardiac surgery.

Download English Version:

<https://daneshyari.com/en/article/3268426>

Download Persian Version:

<https://daneshyari.com/article/3268426>

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