

Clinical Science

Major abdominal surgery in octogenarians: should high age affect surgical decision-making?



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Octogenarians;
Elderly;
Postoperative complications

Abstract

BACKGROUND: Over the last decades longevity has increased significantly, with more octogenarians undergoing surgery. Here, we assess surgical outcomes after major abdominal surgery in octogenarians.

METHODS: Observational cohort of 874 patients undergoing major abdominal elective surgery between January 2009 and March 2014. Seventy-six octogenarians were propensity matched to 76 younger patients, corrected for sex, body mass index, American Society of Anesthesiologists classification, comorbidity, indication, and type of surgery.

RESULTS: Minor complications were more prevalent in octogenarians ($P = .01$) and consisted mainly of respiratory complications; progressing to respiratory insufficiency requiring intubation in 28.6%. Preoperative weight loss (odds ratio 3 [1.1 to 8.3]) and upper gastrointestinal surgery (odds ratio 11 [2 to 60]) were associated with minor complications.

CONCLUSIONS: Octogenarians are at increased risk of minor complications after major abdominal surgery. Major complication rates were similar, indicating the importance of preoperative assessment and standardized surgical techniques. Taking into account preoperative morbidities and type of surgery and techniques. Implementation of quality control algorithms may further improve outcomes in octogenarians. © 2016 Elsevier Inc. All rights reserved.

Over the last decades longevity has increased significantly. In hospitals, the patient population is changing rapidly with a growing elderly population. Where major surgery was seldom

performed in patients older than 80 years a few decades ago, today surgeons operate more and more patients who are older than 80 years, the octogenarians.¹ In the Netherlands, the rate of octogenarians is expected to grow up to 10% of the population by 2050.²

Although surgery has shown beneficial results in many octogenarians, previous studies have shown conflicting results regarding postoperative outcomes in general. Several studies reported low rates of 30-day complication and mortality rates,³⁻⁵ whereas, other studies have reported increased complication and mortality rates with increasing age.^{6,7}

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Regarding major abdominal surgery, elderly patients were found to have increased rates of postoperative morbidity and mortality.⁸ It was also found that these patients had increased rates of comorbidity; patients presented in later stage of disease and were more likely to have emergency surgery.⁶

Complications are associated with comorbid conditions and geriatric syndromes (ie, frailty and cognitive disorders) seen in this population, as well as the severity of illness. The higher rates of morbidity and mortality in the elderly may be explained by the comorbid conditions. In the relation between age and postoperative outcomes, effect-modification and confounding due to comorbidities should be taken into account.

The effect of age, independent of comorbidities, on major abdominal surgery has not yet been fully described.⁸ The objective of this study is; 1st, to assess the surgical outcomes after elective major abdominal surgery in octogenarians, stratified for comorbidities, and 2nd, to assess whether this should influence surgical decision-making.

Methods

An observational cohort study was conducted including all patients that underwent major abdominal elective surgery in the Vrije Universiteit Medical Center, Amsterdam, the Netherlands, between January 2009 and March 2014. Major abdominal surgery was defined as all digestive resections with reconstruction via anastomosis and/or stoma. Patients who underwent upper gastrointestinal (UGI), hepato-pancreatico-biliary (HPB), and colorectal (CR) resections were eligible for analysis. UGI surgery consisted of esophageal resections and gastric resections, HPB procedures consisted of pancreaticoduodenectomy, other pancreatic resection necessitating anastomosis and liver resections with (partial) resection of the biliary tree. CR procedures included all procedures with (partial) resection of the bowel and reconstruction via anastomosis and/or stoma. Both minimally invasive and open procedures were included and both benign and malignant diseases.

An anesthetist preoperatively screened all patients, to assess comorbidity, medication, and functional activity. All patients with an American Society of Anesthesiologist (ASA) classification score of 3 or higher were reviewed in a multidisciplinary setting to assess the indication for surgery, surgical techniques, and possibilities to optimize the patient preoperatively. Data were collected on patient characteristics, comorbidities, use of medication, indication for surgery, operative details, and postoperative outcomes.

All patients received preoperative prophylactic antibiotics intravenously (1 dose of Cefuroxim 1.5 g and Metronidazole 1g) and, during admittance thrombosis prophylaxis was administered according to local protocol. Postoperative complications were reported according to the Clavien-Dindo classification.

The classification was rearranged into 2 groups according to the Clavien-Dindo classification.⁹ Grade I and grade II complications are classified as 'minor complications'. Grade III, IV, and V, are classified as 'major complications,' requiring invasive treatments and possibly even leading up to death.

All patients older than 80 years were identified from the cohort. From the group of patients aged younger than 80, a comparative cohort was propensity matched to the group of octogenarians. Propensity matching was conducted to correct for possible selection bias. Using this technique, the patients were matched for sex, ASA classification, body mass index, comorbidity, indication for surgery (benign or malignant), organ group (UGI, HPB, or CR), and surgical techniques (ie, anastomosis and minimally invasive techniques).

The medical ethics committee of the VU University Medical Center has approved the protocol of this study. Informed consent was waived because of the observational nature of the study.

Statistics

Statistical analysis was conducted with SPSS, version 19.0 (SPSS Inc Chicago, IL). Quantitative data were expressed as means and standard deviations in normal distributions and/or median and interquartile ranges for non-normal distributions. Analysis was conducted with Student *t* test or Mann-Whitney U test as appropriate. Categorical data were expressed as percentages. Analysis was conducted with chi-square tests. To assess predictors of complications in the 2 separate age groups, binary logistic regression techniques were used.

Results

Between January 2009 and March 2014, a total of 874 patients underwent elective major abdominal surgery in the VU medical center in Amsterdam consisting of 202 (23%) UGI procedures, 113 (13%) hepato-pancreatico-biliary (HPB) procedures, and 559 (64%) CR procedures.

Seventy-six patients were aged older than 80 (8.7%) were identified consisting of 13 (17.1%) UGI procedures, 9 (11.8%) HPB procedures, and 54 (71.1%) CR procedures. These patients were propensity matched to 76 patients who were younger than 80, consisting of 18 (23.7%) UGI procedures, 7 (9.2%) HPB procedures, and 51 (67.1%) CR procedures. The cohort of patients younger than 80 was matched to the octogenarians for sex, ASA classification, body mass index, comorbidity, indication for surgery (benign or malignant), and organ group (UGI, HPB, or CR) and surgical techniques (ie, anastomosis and minimally invasive techniques). Baseline characteristics for the total cohort and the matched cohort are listed in [Table 1](#).

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