Bariatric Surgery in an Aging Population: What is an Appropriate Preoperative Workup?

Abbreviations: ACC: American College of Cardiology; CAD: Coronary Artery Disease; AHA: American Heart Association; RCRI: Revised Cardiac Risk Index; EKG: Electrocardiogram

Editorial

According to the United States Census Bureau, 14.1% of the United States population is over the age of 65. Since the 1900's this population has grown from 3 million to 40 million in 2010. By 2030 this population is projected to almost double to 72 million and account for almost 20% of the population [1]. With an expanding population over the age of 65 there will be an increasing obese population within this subset. According to the U.S. Department of Health and Human Services, the rate of the obesity population over the age of 65 has increased from 22% in 1988-1994 to 38% in 2010-2011 [2]. With the positive outcomes of bariatric surgery, we should expect to see more patients over the age of 65 seeking bariatric surgery. There have been multiple studies [3-9] that have shown that bariatric surgery is safe above the age of 65 and even 70 years old. Our question is what is the appropriate work up for an aging population to ensure the best outcomes in this population?

Age alone has never been found to be an absolute contraindication to surgery, especially bariatric surgery [6,7]. Bariatric surgery is an elective procedure that should be performed with the surgeon's expertise and judgment to have the final say over who can undergo surgery [10]. From a cardiac risk standpoint, age alone has also not been found to be an independent predictor of morbidity or mortality [11,12].

Mortality from non-cardiac surgery has been well studied in the current medical literature. In a study from Jin et al. [13] the overall mortality rate among the general population for all non-cardiac surgery was 1.2%. When looking at specific age ranges, this increases to 2.2% in patients 60-69 years old, 2.9% in patients 70-79 years old, 5.8-6.2% in patients >80 years old and 8.4% in patients >90 years old. This was further expanded to look at specifically patients with coronary artery disease (CAD). They found that there was a 4.1% incidence of perioperative MI and 5.5% rate of reinfarction the patient was over the age of 65. This was compared to the general population less than 65 years old at 3.5-4.2% for reinfarction [13]. The American College of Cardiology (ACC) and American Heart Association (AHA) classify intraperitoneal surgery as intermediate risk with a cardiac risk of surgery alone of >1% but <5% [14].

Kheterpal et al. [15] in 2009 found that age was an independent risk factor for a cardiac adverse event after non-cardiac surgery. They found a 1.1% risk for a cardiac adverse event for all non-cardiac operations performed within a 30 day post operative period. Nine independent risk factors were identified including age >68 years old, BMI >30, emergent surgery, previous coronary intervention or cardiac surgery, active congestive heart failure, cerebrovascular disease, hypertension, operation >3.8 hours and the administration of 1 or more units of packed red blood cells intraoperatively.

The original Goldman cardiac risk score included age >70 as a risk factor with a value of 5 points. Intraperitoneal surgery is given a score of 3 points [16]. Just those two factors alone on this scale would place a patient with no other risk factors with a score of 8 and a risk of major cardiac event at 9%. This has since been updated by Lee et al. [17] to the Revised Cardiac Risk Index (RCRI). This scale was validated in patients over the age of 50 years old, but age is not included as a specific risk factor. If only looking at the risk of the surgical procedure of 1 point on the scale, this places bariatric surgery as an RCRI class II and a 1% overall risk for a cardiac event. One limit of the RCRI is the fact that it better predicts cardiac events in patients <55 years old [18]. This limits the ability to extrapolate the overall risk factors and appropriate work up outlined by the RCRI and the need to create an independent risk stratification that can be utilized in the elderly population.

Lee et al. [17] recommended a preoperative EKG and chest x-ray for RCRI class II [18]. Intermediate risk per RCRI would then include lipid lowering agents, tight blood pressure control and no clear recommendation for the addition of noninvasive stress testing. High risk RSRI or signs and symptoms of coronary artery disease should include diagnostic catheterization with revascularization if needed. Special attention should be made to the diabetic population. More aggressive testing should be carried out including electrocardiogram (EKG), noninvasive stress test and close monitoring of creatinine level [19].

There have been several studies looking at overall complications among the bariatric population, but not specifically at cardiac complications and what preoperative work up would be appropriate to predict a worse outcome after surgery. There are two studies that document male patients and higher weight at time of surgery were independent risk factors to overall complications after surgery. Livingston et al. [20] also found in their study that morbidity rate was the same within their young and older population, but those patients greater
than 55 years old had a threefold increase in mortality rate relative to the younger patients.

Obesity has been documented as a major modifiable risk factor for coronary heart disease, ventricular dysfunction, left ventricular hypertrophy, poor left ventricular systolic function and impairment of left ventricular diastolic function, congestive heart failure, stroke and cardiac arrhythmia by the AHA. It is believed that physical exam and EKG alone can underestimate the presence and extent of cardiac disease in the obese patient [10,21-24]. Subtle EKG changes that are nonspecific can be found within the obese population due to body habitus changes of the diaphragm include may lead to an extensive cardiac workup. Echocardiogram can also lead to both false positive and false negative exams with an obese body habitus. Overall, nuclear perfusion scans have been shown effective in the obese population [25-27].

Our biggest challenge as bariatric surgeons before surgery is to identify the severely obese patient who is at higher perioperative cardiovascular risk [28]. The physical examination solo underestimates cardiac dysfunction most of the time in this patient population. The obtainment of a12-lead ECG and a chest radiograph is reasonable in all elderly severely obese patients under consideration for surgery, but sometimes not enough. It is our recommendation, based on our practice experience, to add a dobutamine stress test to those that have history of metabolic syndrome, strong cardiac family history and those who present with abnormal base line testing (EKG, Chest X ray, etc). Abnormal results should be address by the cardiologist for potential indication of coronary catheterization and treatment.

Cardiac symptoms such as exertional dyspnea and lower-extremity edema are nonspecific in obesity. The severely obese patient with poor functional capacity should receive careful clinical evaluation. We should also remember that patients with BMI of 40 or more correlate with higher incidence of cardiomyopathy. In the end in Bariatric Surgery, it is all about safety.

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