

Perforated appendicitis among rural and urban patients: Implications of access to care

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INTRODUCTION: Appendiceal perforation is associated with increased morbidity, length of hospital stay, and health care costs. Higher rates of perforation are believed to be associated with poor access to surgical care. We hypothesized that because of geographic barriers to access and surgical workforce disparities, patients from rural areas with acute appendicitis would be more likely to present with perforation compared with urban patients.

METHODS: Retrospective cohort study of 122,990 patients with acute appendicitis from the Nationwide Inpatient Sample from 2003–2004. ICD-9 codes were used to determine appendiceal perforation. Urban influence codes from the USDA were used to determine rural vs urban status. Univariate and multivariate analyses were used to determine factors associated with perforation.

RESULTS: Overall, 32.07% of patients presented with perforation. Rural patients were more likely than urban patients to present with perforation (35.76% vs 31.48%). Other factors associated with perforation were age > 40, male gender, transfer from another hospital, black race, poorest 25th percentile, and Charlson score greater than 3. In multivariate analysis, rural residence remained a significant predictor of perforation (odds ratio, 1.11; 95% confidence interval, 1.02–1.22). 30% of rural patients were admitted to urban hospitals and had slightly higher perforation rates compared with those admitted to rural hospitals, but this difference was not statistically significant (37.60% vs. 34.97%; $p = 0.251$).

CONCLUSIONS: Patients from rural areas have higher rates of perforation with acute appendicitis compared with urban patients. This difference persists when accounting for other factors associated with perforation. This difference in perforation rates suggests a disparity in access to timely surgical care.

Trends and perioperative outcomes of antireflux surgery in the United States, 1993–2006

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INTRODUCTION: Antireflux surgery is an effective treatment for GERD, but side effects and durability particularly in morbidly obese patients may be problematic. We aimed to determine whether the use of antireflux surgery in the United States has decreased in recent years and to assess the changes in perioperative outcomes.

METHODS: Using the Nationwide Inpatient Sample, we identified all adult patients undergoing antireflux surgery in 1993, 1996, and 2006 and compared the trend and perioperative outcomes of antireflux surgery with those of gastric bypass surgery. In addition to length of stay and in-hospital death, perioperative outcomes included laceration, splenectomy, esophageal dilation, transfusion, total parenteral nutrition, and infection. Statistical methods included the Student t test, chi-square test, and multivariate regressions.

RESULTS: Antireflux surgery increased from 10,385 in 1993 to 33,815 in 1999 but decreased to 22,118 in 2006. Gastric bypass surgery continued to increase after 1999. Compared with 1999, patients undergoing antireflux surgery in 2006 were older (mean age: 50.3 vs 55.8 years), had a longer length of stay (mean: 3.8 vs 4.4 days), and more perioperative complications (5.8% vs 7.8%) (all $p < 0.001$). In 2006, the operative mortality for antireflux surgery was higher than that for gastric bypass surgery (0.73% vs 0.19%; $p < 0.001$).

CONCLUSIONS: Antireflux surgery was done less frequently in the United States in recent years, while gastric bypass surgery surged. Increased morbidity, length of stay, and age suggest an increase in redo antireflux surgery in 2006. Gastric bypass surgery may be safer than antireflux surgery in the morbidly obese patient with GERD.

Preoperative risk factors for severe adverse outcomes in ventral hernia repair

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INTRODUCTION: Ventral hernia repair (VHR) has been identified as 1 of 10 general surgery procedures responsible for over half of the complications and extended hospitalizations. We sought to identify preoperative risk factors for severe adverse outcomes (SAR) to allow appropriate counseling for risk factor modification or nonoperative management.

METHODS: Using the ACS NSQIP data set from years 2005–2007, we identified patients who underwent VHR at over 121 hospitals. We compared 50 preoperative characteristics between patients with and without SAR at 30 days. Multivariable logistic regression was used to identify significant risk factors.

RESULTS: Of 16,226 VHR patients identified, 1,236 (7.6%) had SAR (5.5% death, 52% wound infection, 37% return to OR, 18.7% sepsis, 14.1% ventilator requirement >48 hours, 13.3% pneumonia, 12.4% unplanned intubation, 10.9% septic shock, 5.6% dehiscence, 3.4% acute renal failure, 2.6% cardiac arrest requiring CPR, 1.9% requirement of blood transfusion, 1.4% prosthesis failure, 0.2% myocardial infarction). In multivariable analysis, significant factors associated with SAR were open wounds or ongoing wound infections, poor functional status, BMI > 35, recent prior operation, dyspnea, smoking, > 10% recent weight loss and recurrent hernia (Figure, next page). The c-statistic for the final model was 0.78.

CONCLUSIONS: Patients who smoke, have a BMI greater than 35, >10% recent weight loss, dyspnea, and nonindependent functional status are at greatest risk for SAR. These patients should be targeted for preoperative optimization to prevent SAR. Older patients or those with recurrent hernia, ongoing wound infections, recent surgery, or who require emergency procedures should be counseled appropriately.