

Computed tomography findings associated with the risk for emergency ventral hernia repair



Krislynn M. Mueck, M.D., M.P.H.*, Julie L. Holihan, M.D.,
Jiandi Mo, M.S., Juan R. Flores-Gonzales, M.D., Tien C. Ko, M.D.,
Lillian S. Kao, M.D., M.S., Mike K. Liang, M.D.

Department of Surgery, University of Texas Health Science Center, Houston, TX, USA

KEYWORDS:

Ventral hernia;
CT scan;
Incisional hernia;
Umbilical hernia;
Emergent ventral
hernia repair

Abstract

BACKGROUND: Conventional wisdom teaches that small hernia defects are more likely to incarcerate. We aim to identify radiographic features of ventral hernias associated with increased risk of bowel incarceration.

METHODS: We assessed all patients who underwent emergent ventral hernia repair for bowel complications from 2009 to 2015. Cases were matched 1:3 with elective controls. Computed tomography scans were reviewed to determine hernia characteristics. Univariate and multivariable analyses were performed to identify variables associated with emergent surgery.

RESULTS: The cohort consisted of 88 patients and 264 controls. On univariate analysis, older age, higher ASA score, elevated BMI, ascites, larger hernias, small angle, and taller hernias were associated with emergent surgery. On multivariable analysis, morbid obesity, ascites, smaller angle, and taller hernias were independently associated with emergent surgery.

CONCLUSIONS: The teaching that large defects do not incarcerate is inaccurate; bowel compromise occurs with ventral hernias of all sizes. Instead, taller height and smaller angle are associated with the need for emergent repair. Early elective repair should be considered for patients with hernia features concerning for increased risk of bowel compromise.

© 2016 Elsevier Inc. All rights reserved.

Emergent ventral hernia repair is associated with increased morbidity and mortality when compared with elective ventral hernia repair.¹ Patients with ventral hernias

may present acutely due to increasing pain, increasing hernia size, incarceration of fat (eg, omentum or preperitoneal fat), incarceration of bowel, or skin erosion and necrosis.² The only absolute indication for emergent ventral hernia repair is in the setting of bowel compromise such as incarceration, strangulation, or obstruction.³ In all other settings, surgery can typically be approached in an elective or urgent manner.

Many factors are believed to be associated with acute presentation and the need for emergent repair. Possible reasons for acute presentation include bias in patient selection and access to care. For example, patients with comorbidities such as morbid obesity, smoking, or cirrhosis are often not scheduled for elective repair due to an increased risk of complications, and may instead present emergently. Patients with limited access to healthcare or of

There were no relevant financial relationships or any sources of support in the form of grants, equipment, or drugs.

The authors declare no conflicts of interest.

This project won the 1st place prize for a resident research presentation at the South Texas American College of Surgeons 2016 Regional Conference, and was presented as a quickshot presentation at the 2016 Southwestern Surgical Congress.

* Corresponding author. Tel.: +1-512-627-4907; fax: +1-713-500-7296.

E-mail address: Krislynn.M.Mueck@uth.tmc.edu

Manuscript received April 26, 2016; revised manuscript September 6, 2016



Figure 1 Hernia characteristics measured on CT scan. 1. Hernia width: greatest distance laterally between fascial edges on coronal cuts. 2. Hernia length: greatest cranio-caudal distance between fascial edges on sagittal cuts. 3. Hernia sac height: greatest distance from fascial defect plane to peripheral hernia sac border. 4. Hernia angle: most acute angle between the fascial plane and the hernia sac.

low socioeconomic status may be unable to obtain elective surgical consultation and may only present acutely. Other factors may be mechanical in nature. For example, obese patients and cirrhotics may be at increased risk of incarceration due to increased intra-abdominal pressure forcing contents into a hernia.^{4,5} In addition, conventional surgical wisdom teaches that hernias with small fascial defects are more likely to incarcerate and present acutely. However, there is no published evidence to support this teaching.

The purposes of this study are to determine (1) if there are radiographic features on preoperative CT scan that can identify ventral hernias at increased odds for acute presentation due to bowel compromise; and (2) to determine if, in line with the conventional wisdom, patients with small defects as compared with large defects are more likely to present acutely due to bowel compromise.

Methods

After institutional review board approval, a retrospective, single-center database of patients who had undergone ventral hernia repair was accessed. Emergent cases were identified. Inclusion criteria were (1) all cases performed out of concern for bowel compromise, namely incarceration, obstruction, or strangulation; and (2) a CT scan within one year before repair. Patients at risk for bowel compromise were determined by clinical suspicion as documented in the medical record, and/or presence of bowel incarcerated, obstructed, or strangulated in the hernia on imaging. These patients were then matched 1:3 with randomly selected elective controls using a random number generator.

Recorded patient variables included age, sex, race/ethnicity, American Society of Anesthesiologists (ASA) classification, body mass index (BMI), smoking status, and presence of cirrhosis or ascites. Hernia variables included primary vs incisional hernia, recurrent, and hernia location (eg, medial or lateral to the semilunar lines).⁶ Hernia characteristics on CT included hernia size (eg, width, length,

and area), hernia sac height, and hernia angle (Fig. 1). The width of the fascial defect was measured on transverse cuts as the greatest distance laterally between fascial edges, whereas length was measured on sagittal cuts as the greatest cranio-caudal distance between fascial edges. Fascial defect area was calculated from length and width, and in the case of swiss cheese type hernias with multiple defects, the largest of these was measured. Hernia sac height was defined as the linear distance from the plane of the fascial defect to the peripheral border of the hernia sac on transverse cuts, and hernia angle was defined as the most acute angle between the fascial plane and the hernia sac on transverse cuts at the level of the width measurement. Two surgeons (KMM and JRF) evaluated all CT scans and discussed the first 10 cases to identify and address any differences in measurements.

All statistical analyses were performed using STATA statistical software (StataCorp, College Station, TX). To compare variables for patients who presented emergently to their elective controls, univariate analyses were performed using chi-square for categorical variables and 2-tailed t-test or Mann Whitney U for continuous variables. Stepwise regression modeling was used to construct a multivariable logistic model. Clinical variables were selected a priori based on clinical judgment and previous publications, whereas all radiographic variables with a $P < .2$ were included. These variables included patient comorbidities (ie, BMI, ASA classification, smoking, and ascites), clinical hernia characteristics (ie, hernia type, location, and recurrent status), and radiographic hernia characteristics (ie, defect width, area, hernia angle, and hernia sac height). BMI was included in the multivariable logistic model as a categorical variable using the validated cutoff for morbid obesity of 40.0. Hernia angle was converted from a continuous (degrees) to a categorical variable by reviewing the range and frequency of angles in our study population, and setting cutoffs concordant with the data, which were angle less than 30°, angle between 30° and 70°, and angle greater than 70°. Collinear variables (ie, width and area) were tested

Download English Version:

<https://daneshyari.com/en/article/5731050>

Download Persian Version:

<https://daneshyari.com/article/5731050>

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