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PS38

The Incidence of Ischemic Colitis After Repair of Ruptured Abdominal Aortic Aneurysms is Decreasing in the Endovascular Era

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Objectives: Ischemic colitis (IC) is a well-described complication of ruptured abdominal aortic aneurysm (rAAA). The objective of this study was to compare the incidence of IC in patients with rAAA undergoing open or endovascular aneurysm repair (EVAR), comparing the preimplementation and postimplementation of a formal rupture AAA protocol with modern methods of resuscitation to include permissive hypotension.

Methods: Data on all patients presenting with rAAA to our institution between Jan 1, 2002, and Oct 31, 2013, were collected. Data analyzed included prehospital records, anesthesia reports, operative notes, preoperative and intraoperative imaging, and outcomes. A database with >37,000 variables was created and analyzed. The incidence of IC with open compared with endovascular repair was determined using Pearson χ^2 statistic with significance set at $P < .05$.

Results: During the study period, 303 patients presented with rAAA. Of these, 191 patients underwent open repair, and 89 underwent EVAR. Twenty-three patients died in the emergency department, en route to the operating room, or after choosing comfort care. The overall incidence of IC in this cohort was 16.4% (46 of 280). Of the patients undergoing open repair vs EVAR, the rate of IC was 44% (40 of 191) vs 6.7% (6 of 89; $P = .03$). During the study period, no statistical difference was noted in 30-day mortality for patients with IC between the open (55% [22 of 40]) and EVAR groups (33% [two of six]; $P = .32$). Rates of IC before and after implementation of our formal rupture protocol in 2007 were compared. Before July 2007, the rate of IC was 37.1% (36 of 97). With the protocol in place, the rate of IC decreased to 6.4% (10 of 157; $P = .000$).

Conclusions: With the emergence of EVAR for rAAA, the incidence of ischemic colitis has decreased significantly. However, ischemic colitis continues to portend a poor prognosis after any type of repair. We believe that modern methods of resuscitation to include permissive hypotension are related to this decreased rate of ischemic colitis.

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PS40

Region, Hospital Size, and Case Volume Influence Mortality From AAA Repair

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Objectives: The aim of this paper is to use a national inpatient database to identify variables that impact mortality after elective and ruptured abdominal aortic aneurysm (AAA) repair.

Methods: The National Inpatient Sample was used from 2000 to 2010, and ICD-9 codes for AAA repair used for elective and ruptured cases. Clinical covariates included type of repair, inhospital mortality, total charges converted to 2010 U.S. dollars. Hospital covariates included hospital ownership, size, location (rural vs urban), teaching status, and region.

Table. Demographics and outcomes for patients who underwent AAA repair in the NIS from 2000-2010

	Rupture	*EVAR*	*Inhospital Mortality*	*Emergency Admission*	*LOS*	*Total Charges*	*DRG Risk of Mortality*
			Hospital Control/Ownership				
Government, nonfederal hospital	353 (12.3%)*	1889 (65.9%)*	172 (6.0%)‡	860 (30.0%)	3	$79498	2.12*
Private, nonprofit hospital	2112 (9.7%)*	15196 (70.1%)*	1084 (5.0%)‡	4984 (23.0%)	3	$75535	2.04*
Private, for-profit hospital	277 (7.5%)*	2761 (75.0%)*	147 (4.0%)‡	1102 (30.0%)	3	$98416*	1.94*
			Hospital Bed Size				
Small	219 (9.3%)	1733 (73.5%)*	141 (5.0%)	542 (23.0%)	2	$68241*	1.98
Medium	502 (9.5%)	3866 (72.9%)*	265 (5.0%)	1217 (23.0%)	2	$76886*	1.99*
Large	2020 (9.8%)	14247 (69.3%)*	1028 (5.0%)	5140 (25%)‡	3	$80260*	2.05*
			Hospital Location				
Rural	190 (9.9%)	1315 (68.4%)	96 (5.0%)	519 (27.0%)‡	3	$62444*	1.99
Urban	2552 (9.7%)	18532 (70.4%)	1315 (5.0%)	6308 (24.0%)‡	3	$79838*	2.04
			Hospital Teaching Status				
Nonteaching	1051 (8.6%)*	8702 (71.4%)*	609 (5.0%)	3044 (25.0%)	3	$78,262	1.99*
Teaching	1689 (10.5%)*	11150 (69.5%)*	802 (5.0%)	3848 (24.0%)	3	$78,670	2.07*
			Hospital Region				
Northeast	537 (9.8%)	4058 (74.0%)*	274 (5.0%)	1259 (23.0%)	3	$73,385	2.03
Midwest	705 (9.6%)	4932 (67.1%)*	367 (5.0%)	1616 (22.0%)*	3	$72,280	2.05
South	975 (9.0%)	7771 (71.4%)*	435 (4.0%)‡	675 (27.0%)*	3	$78,646	1.99*
West	554 (11.5%)*	3312 (68.5%)*	290 (6.0%)‡	1209 (25.0%)*	3	$100,288*	2.11*

*$P < .001$.
‡$P < .05$

Results: Mortality from all AAA repair is up to 50% greater in Western states, with up to a 39% increase in total charges; this is associated with a 6% greater Diagnosis Related Group (DRG) mortality score and a higher proportion of ruptured aneurysms. Small hospitals (<100 beds) need to complete an average of five AAA repairs annually or see a 200% increase in mortality, whereas larger hospitals need to complete at least 10 AAA repairs before seeing the same benefit.

Conclusions: Western region, small hospital size, and completing fewer than five to 10 AAA repairs annually influence mortality after AAA repair. Some of the variation may be due to increased ruptured AAAs and more ill patients in the Western hospitals sampled. Overall mortality from ruptured AAA is greatest for hospitals in the Western United States and has increased 12% over the past 10 years.

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PS42

National Trends of Operative Approach and Mortality for Ruptured Abdominal Aortic Aneurysms from 2002 to 2011

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Objectives: We sought to determine if trends of declining rates of ruptured abdominal aortic aneurysm (rAAA) were sustained through the most recent available data. We also examined factors associated with use of endovascular aneurysm repair (EVAR) and survival after rAAA.

Methods: We analyzed fee-for-service Medicare claims for patients diagnosed with a rAAA from 2002 through 2011. Data included patient demographics, hospital characteristics, treatment type (EVAR or open surgical repair; OSR), and perioperative mortality (death upon discharge or ≤30 days of repair). Statistical analysis included χ^2 or nonparametric tests for trends, and multivariable logistic regression.

Results: The cohort of rAAA comprised 4996 patients. Repair for rAAA hospitalizations declined from 11.3/100,000 Medicare beneficiaries in 2002 to a nadir of 7.84 in 2007. From 2007 the rates have increased to a rate 8.84 in 2011 ($P < .001$ for trend). The use of EVAR increased for each subsequent year (7.84% in 2002 to 51.4% in 2011; $P < .001$). Mortality was lower for EVAR compared with OSR (30.0% vs 46.6%; $P < .001$). Improved mortality (52% in 2002 to 33% in 2011; $P < .001$) was observed for EVAR (44% in 2002 to 26% in 2011; $P = .014$) and OSR (53% in 2002 to 41% in 2011; $P = .001$). After adjusting for patient factors, EVAR was more commonly performed for men (odds ratio [OR], 1.68 95% confidence interval [CI], 1.60-1.77; $P < .001$), in metropolitan hospitals (OR, 1.15; 95% CI, 1.10-1.20; $P < .001$), and at high-volume hospitals (OR, 1.23; 95% CI, 1.17-1.30; $P < .001$). Improved operative mortality was independently associated with EVAR (OR, 0.26; 95% CI, 0.23-0.28; $P < .001$), male sex (OR, 0.69; 95% CI, 0.64-0.75; $P < .001$), and treatment in high-volume centers (OR, 0.73; 95% CI, 0.66-0.82; $P < .001$).

Conclusions: Repair for rAAA has increased since 2007. Although survival has increased for both OSR and EVAR, it has improved the most for those undergoing EVAR for rAAA. Systems that improve access to EVAR and expertise for rAAA may improve population-level outcomes.

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PS44

Functional Status as a Predictor of Mortality in Open and Endovascular Abdominal Aortic Aneurysm Repair in Octogenarians

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Objectives: The frequency at which patients aged >80 years are presenting for abdominal aortic aneurysm (AAA) repair is increasing. Here we examine the value of functional status in predicting outcomes in endovascular (EVAR) and open (OR) abdominal aortic aneurysm repair within this population.

Methods: All patients who underwent EVAR or OR from 2002 to 2010 in the Veterans Affairs National Surgical Quality Improvement Program (VASQIP) database were identified. Functional status (F), defined as an ordinal scale from 1-3 (1, independent; 2, partially dependent; 3, totally dependent), was examined using multivariate regression models, with 30-day mortality as the primary outcome; morbidity was examined as a secondary end point. Statistical analysis was performed using a Student *t*-test, or χ^2 test, where appropriate.

Results: In total, 9030 patients underwent AAA repair (4822 EVAR, 4208 OR); mortality was 2.8% (1.7% vs 4.2%, respectively; $P < .001$). Of these, 1340 patients were ≥80 (902 EVAR, 438 OR); mortality was 4.9% (2.9% vs 9.1%, respectively; $P < .001$). Functional status was abnormal (2 to 3) in 9.5% of all patients and in 5.1% of those ≥80 (see Table).

Conclusions: Functional status is an independent predictor of mortality for EVAR and OR, it is generally not associated with increased morbidity, however, does correlate to a longer length of stay. This trend is more pronounced among those ≥ 80 years.

Table.

	All AAA (n = 9030)				*≥80 years old (n = 1340)*			
	F = 1	*F = 2-3*	*OR*	P	*F = 1*	*F = 2-3*	*OR*	P
30-d mortality, %	2.5	8.0	3.3	<.001	3.9%	14.8	4.4	<.001
LOS, days	7.1	10.5		<.001	7.9	12.2		<.001
Neurologic, %	4.3	1.1	2.4	.068	0.5%	0.8	1.6	.505
Cardiac, %	1.4	1.9	1.4	.321	2.1%	3.9	1.9	.210
Pulmonary, %	5.7	10.3	1.9	<.001	6.5%	10.9	1.8	.068
Renal, %	1.7	2.5	1.5	.202	2.6%	3.9	1.5	.382

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