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Penetrating Ulcers of the Abdominal Aorta and Iliac Arteries: Harbingers of Aortic Catastrophe or Benign?

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Objectives: Penetrating aortic ulcers can be a concerning finding on imaging. They are believed to be the predecessors for intramural hematomas, dissections, and aneurysm degeneration. It is hypothesized that penetrating ulcers of the abdominal aorta (PUAA) and iliac arteries (PUIA), like their thoracic counterparts, signal impending vascular catastrophe.

Methods: With the institution of electronic medical records at our health system in 2010, a search for the words "penetrating ulcer" in radiology reports became possible. Fifty-three patients were identified as having a penetrating ulcer of the abdominal aorta (PUAA) on computed tomography angiography during a 10-month period from October 2010 through August 2011, and 34 were identified as having a PUIA. The patients' clinical course was monitored through August 2014. No specific intervention for the ulcers was performed; however, if the patient had additional aortic pathology necessitating intervention, it was performed. Retrospective and prospective review of imaging was performed when possible. Student's *t*-test and χ^2 tests were performed for statistical analysis.

Table. Comparison of patients with penetrating ulcers of the abdominal aorta (*PUAA*) and iliac arteries (*PUIA*)

Variable	*PUAA (n = 53)*	*PUIA (n = 34)*	P
Age, years	76.7 ± 10.2	74.5 ± 10.0	.315
Males, No. (%)	35 (66)	28 (82)	.097
Length of follow-up, months	35.7 ± 29.9	34.7 ± 20.6	.613
Patients with serial imaging, No. (%)	30 (57)	19 (60)	.940
Length of time for serial imaging, months	20.6 ± 30.5	29.6 ± 19.7	.626
Concurrent aortic dissection or aneurysm, No. (%)	23 (46)	19 (56)	.255
Change in ulcer appearance or aortic diameter, No. (%)	13/30 (43)	1/19 (5)	*.004*
If change, worsening, No. (%)	8/30 (27)	1/19 (5)	.059
Died during follow-up, No. (%)	19 (36)	7 (21)	.129
Cause of death related to aortic pathology, No. (%)	5/19 (26)	1/7 (14)	.518

Results: The Table compares the two populations studied, PUAA and PUIA. Eight patients had both PUAA and PUIA. Of the five PUAA deaths related to aortic pathology, one died of complications related to type B dissection, three died of complications related to lower extremity thromboembolism, and one died of multisystem organ failure after attempted surgical repair of his iliac artery aneurysm. The one PUIA death related to aortic pathology died of complications related to lower extremity thromboembolism.

Conclusions: The patients identified with PUAA and PUIA were generally elderly with multiple comorbidities. A large percentage of patients had concurrent, separate, aortic pathology, most frequently aortic aneurysms, which were treated if size indicated. Small changes in the appearance of the PUAA were frequent, but did not equate with abdominal aortic catastrophe. Thromboembolic events occurred not infrequently in these patients. The mortality for these populations was high, but the change noted in the ulcers' appearance during follow-up did not suggest ulcer treatment would improve survival.

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Impact of Physician Specialty on Outcomes Following Thoracic Endovascular Aneurysm Repair

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Objectives: Thoracic endovascular aneurysm repair (TEVAR) is commonly performed by interventional radiologists, cardiologists, general surgeons, cardiothoracic surgeons, and vascular surgeons, with each specialty having differences in residency structure, operative experience, and subspecialty training. The aim of this study was to evaluate the impact of surgeon specialty on outcomes after TEVAR.

Methods: Patients who underwent TEVAR were identified from the 2007-2009 Nationwide Inpatient Sample (NIS). Physician identifiers in the NIS were used to determine surgical specialty and operative experience. Multivariate analysis adjusted for surgeon experience and mortality risk was used to compare differences in demographics, complications, outcomes, and hospital covariates.

Results: A total of 2531 TEVAR cases were completed during the study period, of which 73.8% were completed by vascular surgeons, 15.8%

Table I. Patient characteristics for those who underwent thoracic endovascular aneurysm repair (TEVAR) by specialty

Variable	*Interventional radiologist*	*Interventional cardiologist*[a]	*General surgeon*[a]	*Cardiothoracic surgeon*	*Vascular surgeon*
Demographics					
Total cases, No. (%)	203 (8.0)	40 (1.6)	20 (0.8)	400 (15.8)	1868 (73.8)
Age, years	62.4 ± 20.2	49.8 ± 23.4	38.8 ± 11.7[b]	66.3 ± 14.1	66.4 ± 15.7[b]
Female gender, %	39.6	49.6	25.7	37.5	42.5
Elective, %	77.8[b]	26.5	0.0[b]	47.2[c]	53.8
DRG mortality risk	3.5 ± 0.9	1.5 ± 0.5	+	3.4 ± 1.1	3.6 ± 1.0[d]
DRG severity of illness	2.4 ± 0.9	3.1 ± 1.1	+	2.6 ± 0.9	2.6 ± 1.0
Complications, %					
leeding	5.4	+	+	9.1	7.8
Stroke	7.6[b]	+	+	0.0[d]	1.1[d]
Cardiac	7.2[d]	+	+	6.1	3.6[c]
Respiratory	4.8[c]	+	+	1.2	1.9
Vascular	7.5[b]	+	+	2.4	2.6
SSI	2.8[c]	+	+	0.0	0.8
Other	0.0	+	+	0.0	0.2
Outcomes					
Length of stay, days	10.7 ± 14.1	15.1 ± 14.4	27.7 ± 16.0[b]	9.3 ± 10.3	10.1 ± 13.2
Costs	$52,156	$72,447	$52,742	$45,120	$46,450
Mortality, %	2.6	+	+	8.6[c]	5.5
Hospital covariates, %					
Urban location	100	100	100	100	96.3[c]
Teaching hospital	59.7[b]	100	100	87.5	84.3

DRG, Diagnosis-related group; *SSI*, surgical site infection.
[a]Insufficient sample size; data do not accurately represent population-level estimates.
[b]$P < .001$.
[c]$P < .01$.
[d]$P < .05$.