

Symptomatic Aneurysms: How do These Patients Do in the Long Term?

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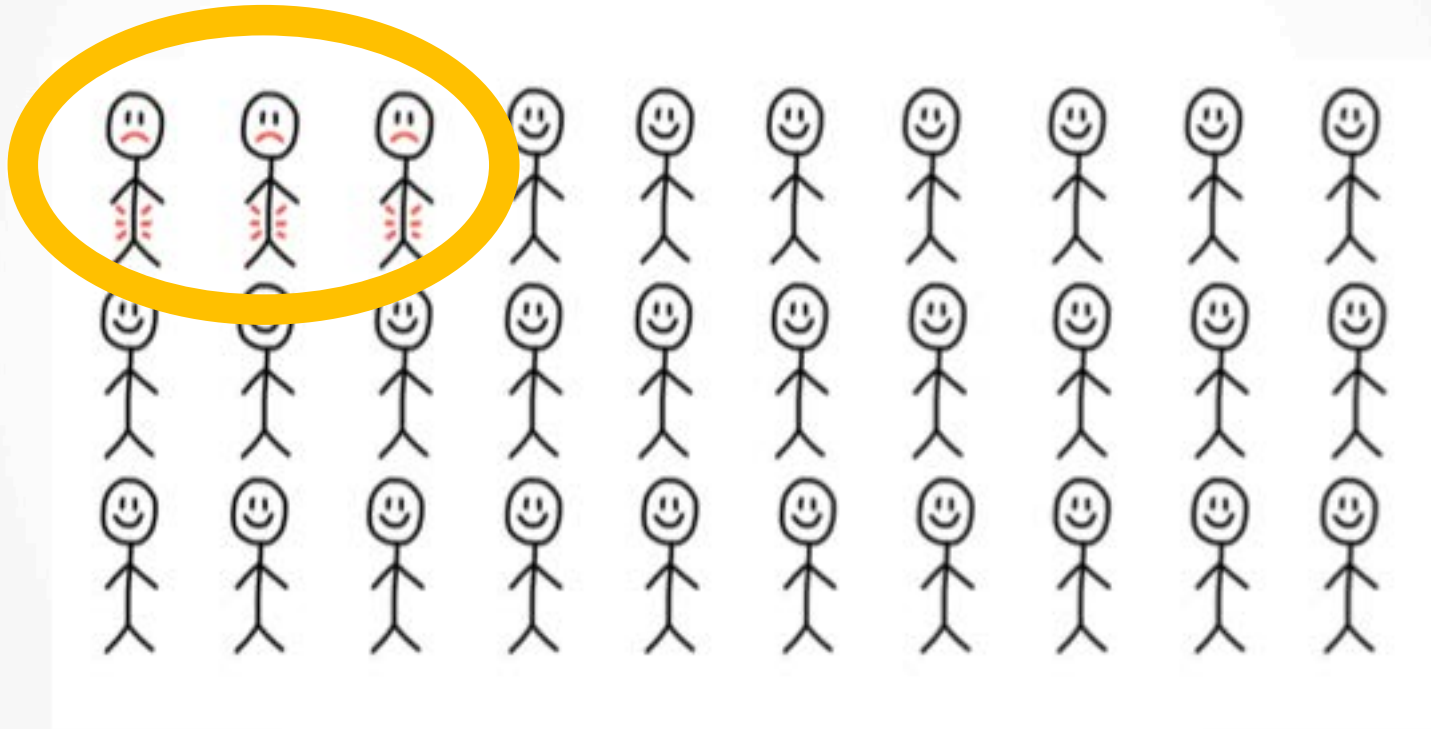
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DISCLOSURE

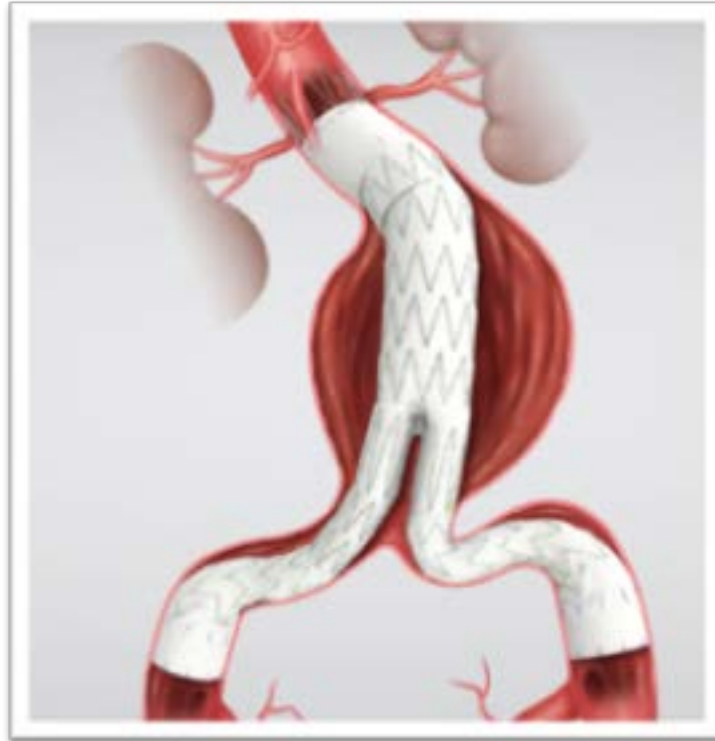
Venita Chandra, MD

- No relevant financial relationship reported

Symptomatic AAAs



Symptomatic AAAs



What do we know about SxAAA's?

Symptomatic, Nonruptured Abdominal Aortic Aneurysms: Are Emergent Operations Necessary?

Robert A. Cambria, MD, Peter Glevitzki, MD, Anthony W. Stanson, MD, Kenneth J. Cherry, Jr., MD, John W. Hallett, Jr., MD, Thomas C. Bower, MD, and Peter C. Patel, MD, Rochester, Minnesota

To evaluate current morbidity and mortality and to define the best strategy of management, we retrospectively reviewed the clinical histories of 36 patients (24 males and 12 females) who underwent repair of symptomatic, nonruptured abdominal aortic aneurysms (AAA) between April 1, 1987, and April 30, 1992, at the Mayo Clinic (3.2% of 1111 patients with AAA). Ages ranged from 54 to 94 years (mean, 75 years).

- 36 patients with abdominal/back pain vs 72 elective matched controls

Clinical management of the symptomatic but unruptured abdominal aortic aneurysm

Cornelius A. Sullivan, MD, Michael J. Rohrer, MD, and Bruce S. Cutler, MD, Worcester, Mass.

Pain or tenderness of an abdominal aortic aneurysm is a symptom of expansion and imminent rupture. In a retrospective study of 19 patients with a symptomatic but unruptured AAA compared with 117 patients undergoing elective repair and 69 patients having operation for a ruptured AAA, morbidity was high in the patient group with a symptomatic AAA, including a 21% incidence of myocardial infarction, a 31% incidence of ventilatory failure, and a 31% incidence of mortality.

- 19 patients with acutely expanding AAAs vs. 117 elective

- Older
- More female
- Higher morbidity
- Higher mortality



What do we know about SxAAA's?

From the New England Society for Vascular Surgery

Outcomes of symptomatic abdominal aneurysm repair

Randall R. De Martino, MD,^a Brian W. N. ...
Catherine K. Chang, MD,^a Andres Schan...
Jack L. Cronenwett, MD,^a for the Vascu...
Worcester, Mas; Bangor, Me; and Burlingto

Objective: Operative mortality of patients under...
reported at 6% to 30% during the past 25 years...
outcomes of patients undergoing repair of Sx-...
Methods: All patients undergoing infrarenal AAA...
New England (VSGNNE) between 2003 and...
accompanied by abdominal or back pain or tend...
mortality. Secondary end points included in-ho-



From the Society for Clinical Vascular Surgery

Outcomes for symptomatic abdominal aortic aneurysms in the American College of Surgeons National Surgical Quality Improvement Program

Peter A. Soden, MD,^a Sa...
Dominique B. Buck, MD...
Marc L. Schermerhorn, M...

Background: Historically, symptomatic AAA repair was compared with asymptomatic AAA repair. However, a recent study suggested that mortality was higher for asymptomatic AAA repair. The purpose of this study was to evaluate the mortality and morbidity of symptomatic AAA repair in a large contemporary population.

Methods: All patients undergoing infrarenal AAA repair in the 2011 to 2012 American College of Surgeons National Surgical Quality Improvement Program were included in this study.

- Mixed perioperative mortality results
- No longer term follow-up beyond 5 years

- VSGNE
- 156 sxAAAs
- No Difference in in-hospital mortality
- Decreased survival at 1 and 4 years

- NSQIP
- 455 sxAAAs
- Increased 30-day mortality



Long-term outcomes after repair of symptomatic abdominal aortic aneurysms

Venita Chandra, MD,^a Karen Trang,^b Whitt Virgin-Downey,^b Ronald L. Dalman, MD,^a and Matthew W. Mell, MD, MS,^a *Stanford, Calif*

ABSTRACT

Objectives: Previous studies have reported increased perioperative mortality of nonruptured symptomatic abdominal aortic aneurysms (Sx-AAA) compared with asymptomatic elective AAA (E-AAA) repair, but no long-term outcomes have been reported. We sought to compare long-term outcomes of Sx-AAA and E-AAA after repair at a single academic institution.

Methods: Patients receiving AAA repair for Sx-AAA and E-AAA from 1995 through 2015 were included. Ruptured AAA and suprarenal or thoracoabdominal AAA were excluded. Demographics, comorbidities, and operative approach were collected. Long-term mortality was the primary outcome, determined by chart review or link to Social Security Death Index. Additionally, long-term mortality and reinterventions were compared after groups were matched with nearest neighbor propensity to reduce bias.

Results: AAA repair was performed for 1054 E-AAA (585 open repair [56%], 471 endovascular aneurysm repair [EVAR] [44%]), and 139 symptomatic aneurysms (60 open repair [43%], 79 EVAR [57%]). Age (73 years vs 74 years, $P = .1$) and aneurysm diameter were similar between Sx-AAA and E-AAA (6.0 cm vs 5.8 cm, $P = .5$). The proportion of women was higher for Sx-AAA (26% vs 16%, $P = .003$), as was the proportion of non-Caucasians (40% vs 29%, $P = .006$). After propensity matching, there were no differences between groups for patient characteristics, AAA diameter, treatment modality, or comorbidities, including hypertension, coronary artery disease, congestive heart failure, diabetes, hyperlipidemia, lung disease, diabetes, renal disease, and smoking history. Women were treated for Sx-AAA at significantly smaller aortic diameters, however, compared with men (5.1 cm vs 6.3 cm, $P < .001$). Perioperative mortality was 5.0% for Sx-AAA and 2.3% for E-AAA ($P = .055$). By life-table analysis, Sx-AAA had lower 5-year (62% vs 71%) and 10-year (39% vs 51%) survivals ($P = .01$) compared with E-AAA for the entire cohort. Similar trends were observed for 5-year and 10-year mortality after propensity matching (63% and 40% vs 71% and 52%, $P = .05$). When stratified by repair type, 5-year and 10-year survivals trended lower after open surgery (68% and 42% Sx-AAA vs 84% and 59% E-AAA, $P = .08$) but not EVAR (59% and 40% Sx-AAA vs 61% and 49% E-AAA, $P = .4$). Aneurysm-related reinterventions were similar for Sx-AAA and E-AAA (15% vs 14%, $P = .8$). Reinterventions were more common after EVAR compared with open repair (22% vs 7%, Sx-AAA $P = .015$; 20% vs 4% E-AAA, $P = .007$).

Conclusions: Patients with Sx-AAA had lower long-term survival and similar aneurysm-related reinterventions compared with patients with E-AAA undergoing repair. Women also underwent repair for Sx-AAA at a significantly smaller size when compared with men, which emphasizes the role of gender in AAA symptomatology. Differences in long-term survival may be only partially explained by measured patient, aneurysm, and operative factors, and may reflect unmeasured social factors or suggest inherent differences in pathophysiology of Sx-AAAs. (*J Vasc Surg* 2018;■:17)

SxAAA vs. EAAA
over 20 years

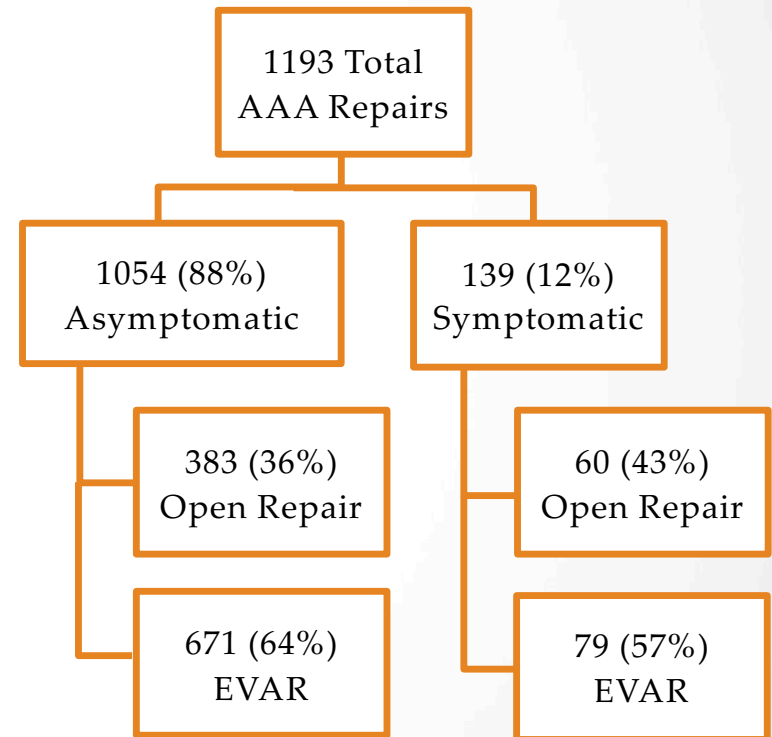


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Methods

- Retrospective chart review
- Nonruptured AAA repair between 1/1/1995 – 12/31/2014
- Cross-referenced to Social Security Death Index



What do we really mean by symptoms?

Back/Flank Pain

Abdominal/
Epigastric Pain

Thromboembolic
Complications

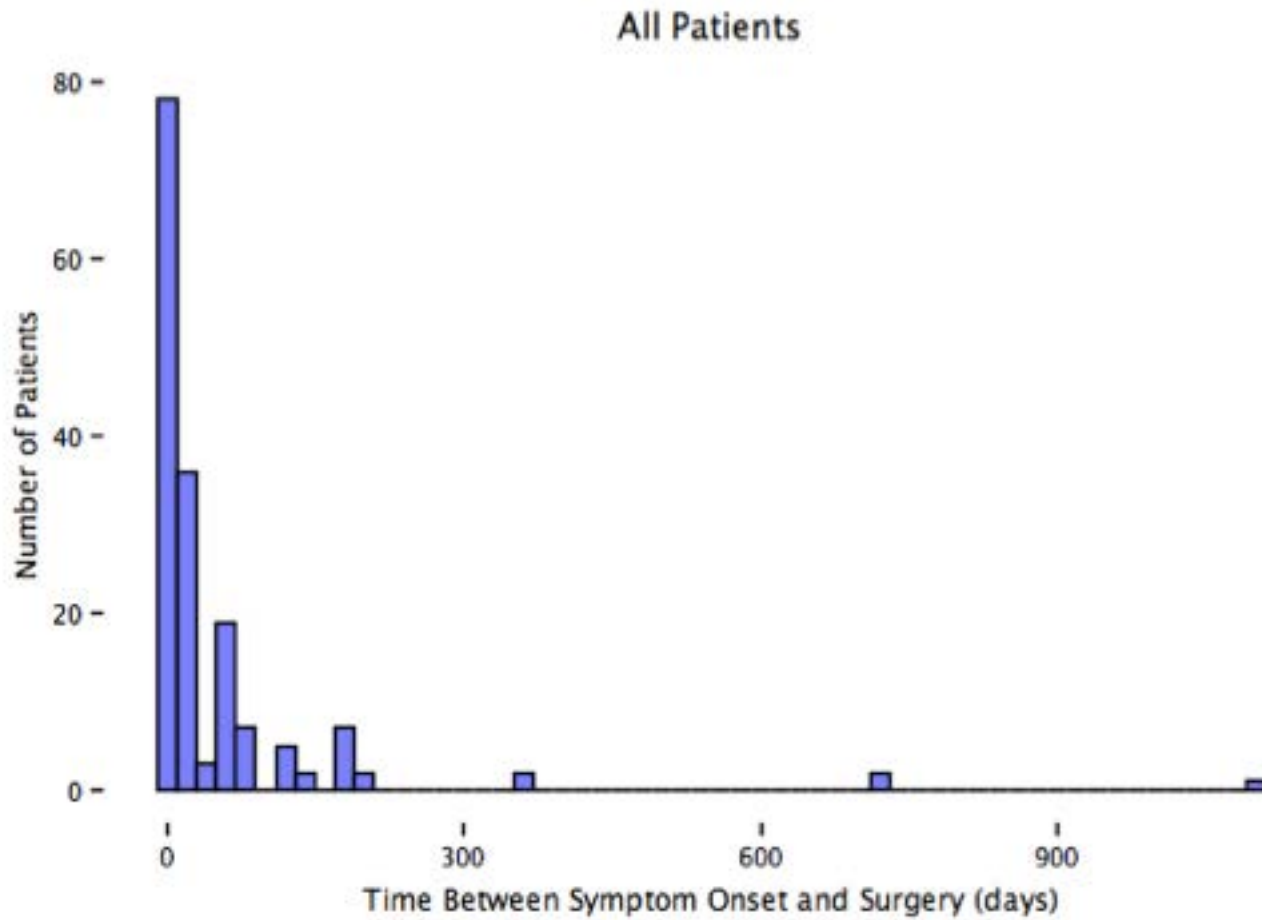
Tenderness over
aneurysm



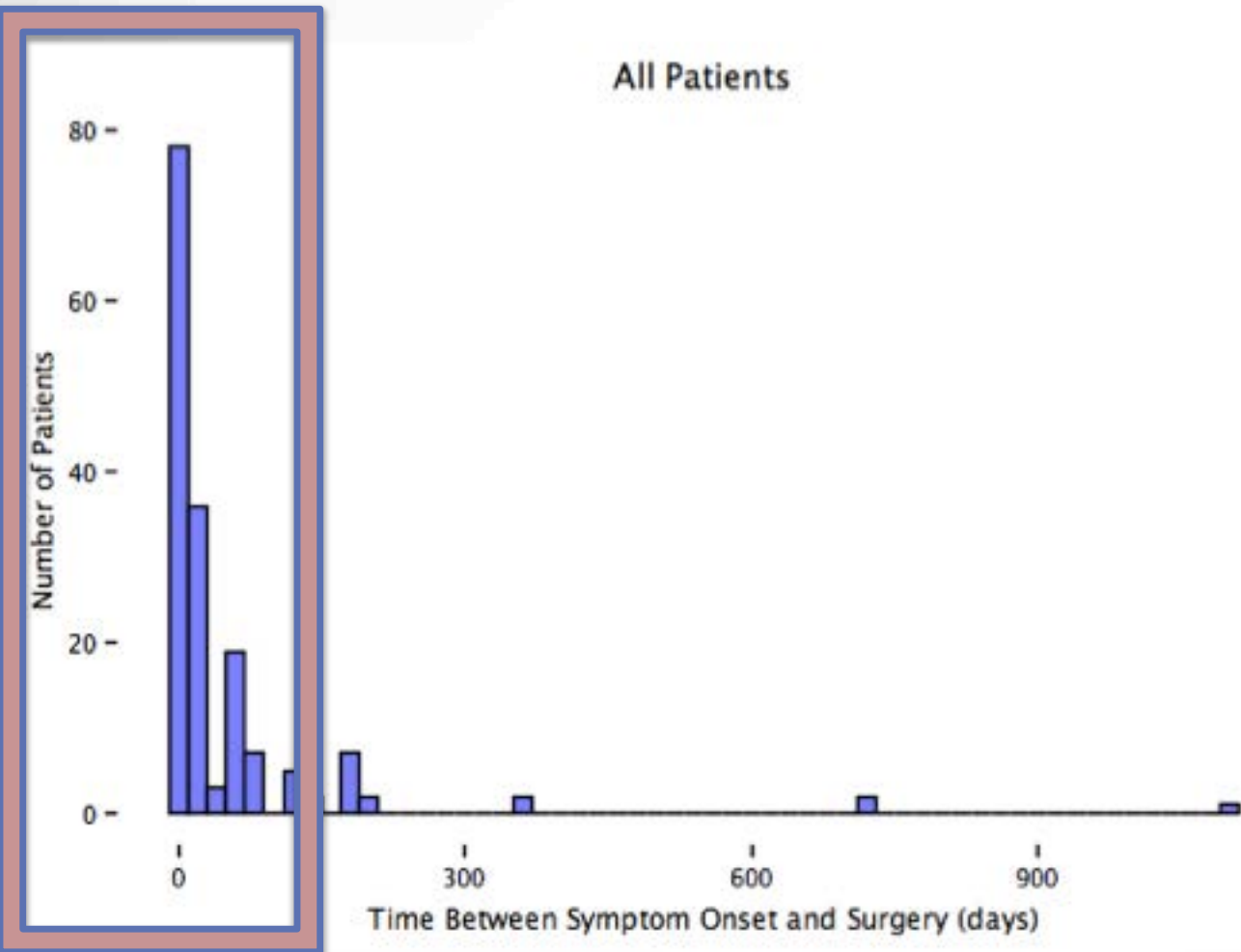
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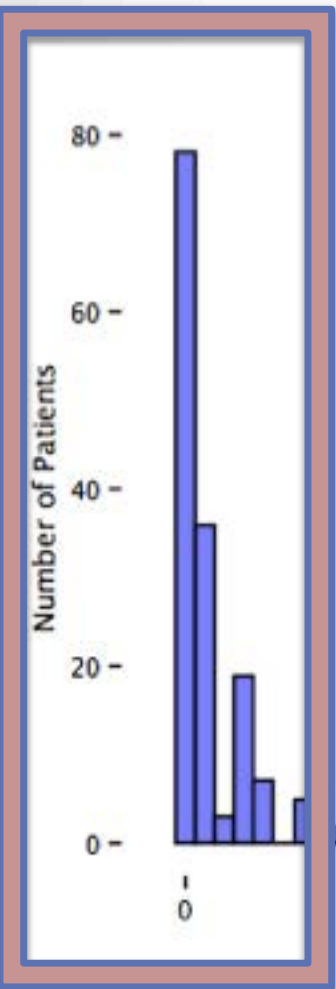
Defining Symptomatic



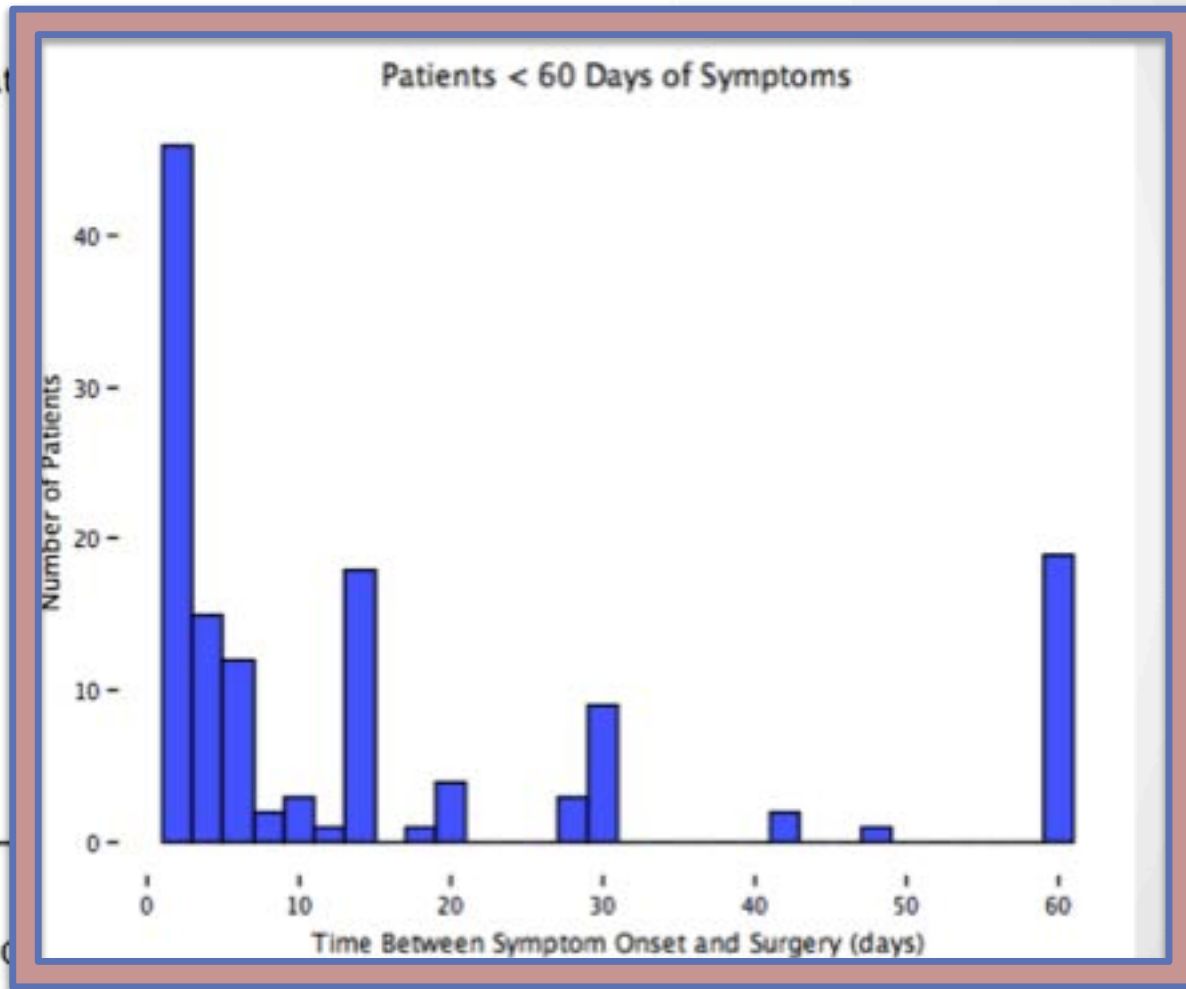
Defining Symptomatic



Defining Symptomatic



All Pat



Patients < 60 Days of Symptoms



What were their symptoms?

SxAAA	
Symptoms (%)	
Abdominal Pain	60
Back Pain	41
Tender Aneurysm	12.5
Embolic Event	8.7



Demographics – Entire Cohort

	Sx-AAA (n=139)	E-AAA (n=1054)	p-value
Age (yrs \pm s.d.)	73 \pm 10	74 \pm 8	0.13
Female	26%	16%	0.003
Non-Caucasian	40%	29%	0.009



Demographics – Entire Cohort

	Sx-AAA (n=139)	E-AAA (n=1054)	p-value
Age (yrs \pm s.d.)	73 \pm 10	74 \pm 8	0.13
Female	26%	16%	0.003
Non-Caucasian	40%	29%	0.009



Demographics – Propensity Matched

	Sx-AAA (n=136)	E-AAA (n=136)	p-value
Age (yrs ± s.d.)	73 ± 10	72 ± 9	.9
Female	26%	29%	.6
Non-Caucasian	40%	38%	.7
Smoker	69%	75%	.3
CAD	45%	51%	.4
CHF	12%	13%	.9
Hypertension	71%	71%	.9
Hyperlipidemia	47%	57%	.1
COPD	26%	29%	.5
Diabetes	10%	16%	.1
CKD	17%	13%	.3



Operative Characteristics

	Entire Cohort			Propensity-matched Cohort		
	Sx-AAA (n=139)	E-AAA (n=1054)	p-value	Sx-AAA (n=136)	E-AAA (n=136)	p-value
% EVAR	57%	64%	0.12	57%	63%	0.32
Aneurysm Diameter (cm ± s.d.)	6.0 ± 1.6	5.8 ± 1.2	0.18	6.0 ± 1.6	5.9 ± 1.2	0.55



Does Gender Matter?

	Entire Cohort		Propensity-matched Cohort	
	Sx-AAA (n=139)	E-AAA (n=1054)	Sx-AAA (n=136)	E-AAA (n=136)
Aneurysm Diameter Men	6.3+/- 1.6	5.8 +/- 1,2	6.3 +/- 1.6	6.0 +/- 1.3
Aneurysm Diameter Women	5.1 +/- 1.0	5.6+/- 1.0	5.1 +/- 1.0	5.6 +/- 1.0
P-value	<0.001	0.03	<0.001	0.04



Does Gender Matter?

	Entire Cohort		Propensity-matched Cohort	
	Sx-AAA (n=139)	E-AAA (n=136)	Sx-AAA (n=136)	E-AAA (n=136)
Aneurysm Diameter (mm)	5.6 +/- 1.0	6.0 +/- 1.3	5.1 +/- 1.0	5.6 +/- 1.0
P-value	<0.001	0.03	<0.001	0.04

Women have SxAAA more frequently and at SMALLER sizes



Matched Cohort Operative Details

	Sx-AAA (n=136)	E-AAA (n=136)	p-value
Open Repair			
Graft diameter (mm)	16 (16-18)	16 (16-18)	.8
Estimated Blood Loss (cc)	670 +/- 870	620 +/- 940	.2
EVAR			
Stent diameter (mm)	26 (24-30)	26 (25-30)	.8
Fluoroscopic time (min)	27 +/- 14	31 +/- 20	.3
Contrast volume (cc)	115 +/- 57	98 +/- 50	.1
Estimated Blood Loss (cc)	370 +/- 450	301 +/- 260	.3

Matched Cohort: Post-operative Complications

	Sx-AAA (n=136)	E-AAA (n=136)	p-value
MI	3.0%	0.8%	.4
Stroke	0%	1.5%	.2
Pulmonary	7.4%	6.1%	.8
Genitourinary	6.7%	3.8%	.4
Renal	3.7%	3.8%	.9
Gastrointestinal	0%	0.8%	.5
DVT	1.5%	3.8%	.3
Wound Infection	8.9%	13.7%	.2



Matched Cohort Length of Stay

	Sx-AAA (n=136)	E-AAA (n=136)	p-value
Overall	5 (3-7)	4 (2-7)	.06
Open Repair	7 (6-9)	7 (5-8)	.8
EVAR	2 (2-4)	3 (2-4)	.15



Perioperative Mortality

	Entire Cohort			Propensity-matched Cohort		
	Sx-AAA (n=139)	E-AAA (n=1054)	p-value	Sx-AAA (n=136)	E-AAA (n=136)	p-value
Overall	5.0%	2.3%	0.055	5.2%	2.2%	0.3
Open Repair	6.7%	4.2%	0.3	6.9%	2.0%	0.4
EVAR	3.8%	1.2%	0.1	3.9%	2.3%	0.7

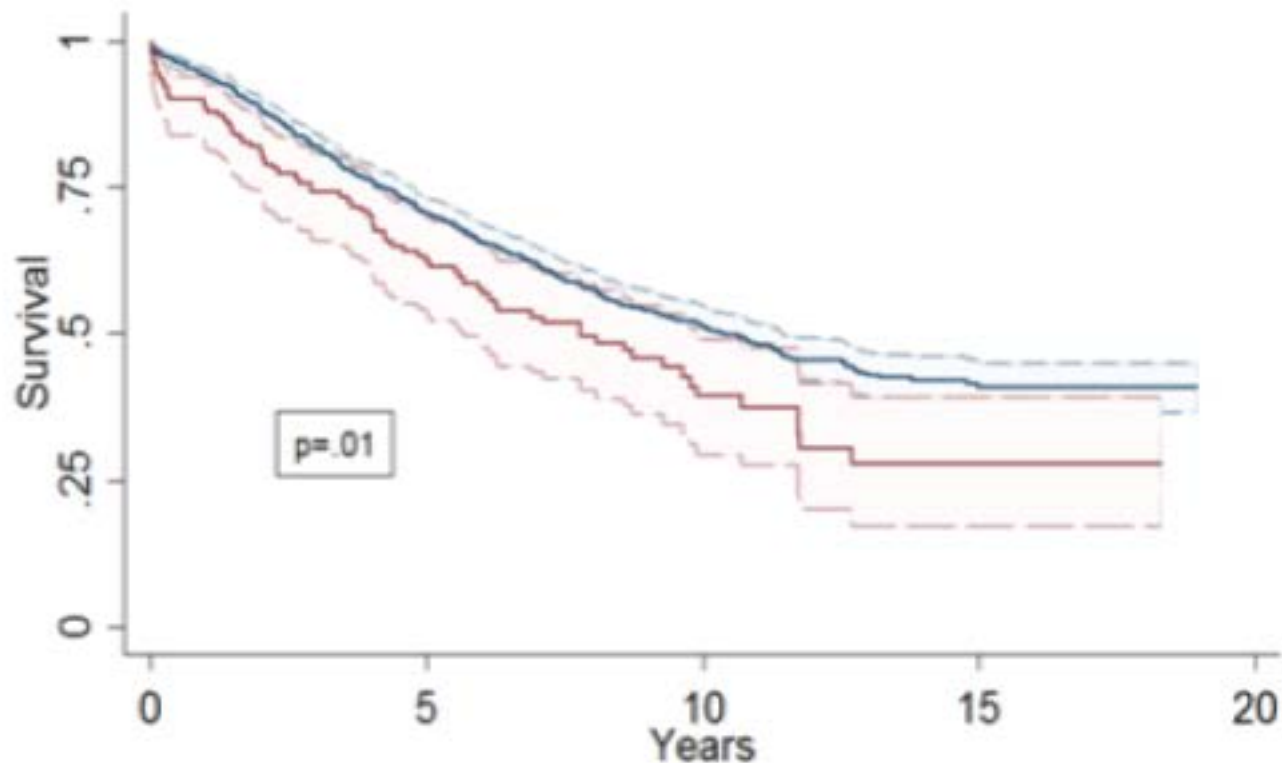


Perioperative Mortality

	Entire Cohort			Propensity-matched Cohort		
	Sx-AAA (n=139)	E-AAA (n=1054)	p-value	Sx-AAA (n=139)	E-AAA (n=136)	p-value
Overall	5.0%	2.3%	0.055	5.2%	2.2%	0.3
Open Repair	6.7%	4.2%	0.3	6.9%	2.0%	0.4
EVAR	3.8%	1.2%	0.1	3.9%	2.3%	0.7



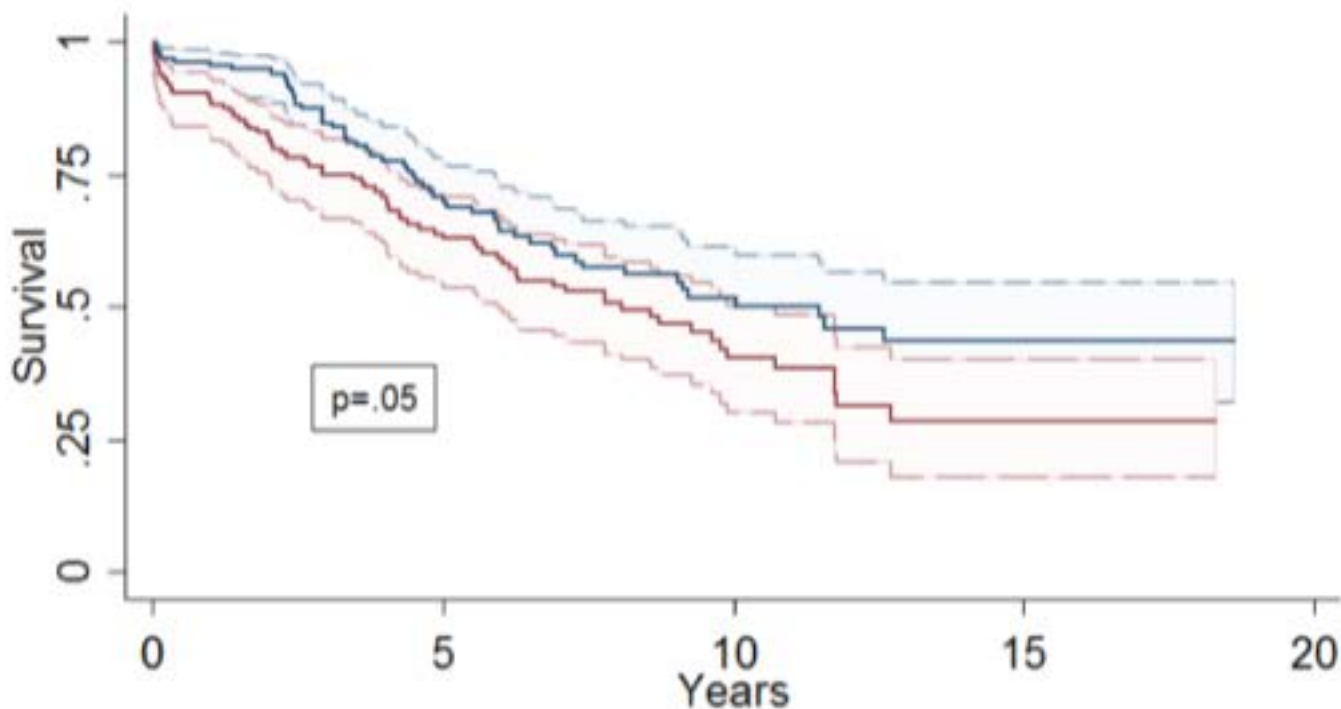
Long Term Survival



Number at risk						
Asymptomatic AAA	1049	603	287	61	0	
Symptomatic AAA	139	71	24	4	0	



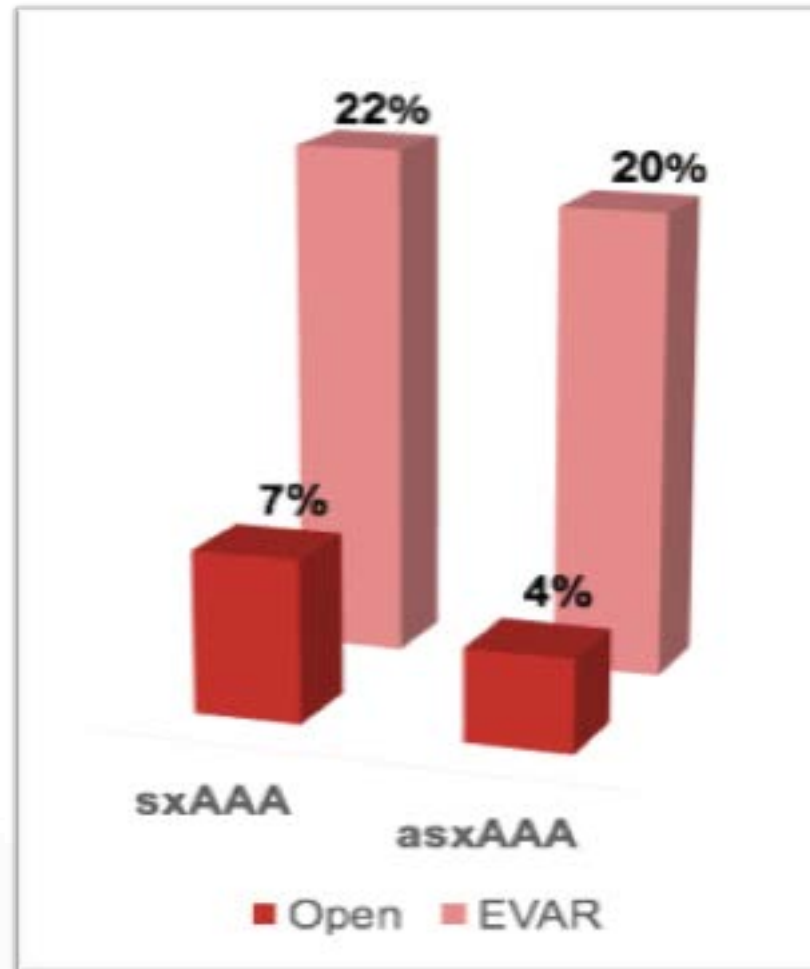
Long Term Survival



Number at risk		0	5	10	15	20
Asymptomatic AAA	135	71	32	10	0	0
Symptomatic AAA	136	70	24	4	0	0



Aneurysm-Related Re-Intervention



Conclusions

- Patients with SxAAs are more likely to be women, and women have SxAAs at smaller sizes
- SxAAs have decreased long-term survival as compared to elective repair
 - Perioperative morbidity is similar
- Underlying cause of these differences unknown:
 - Inherent differences in the pathophysiology of symptomatic aneurysms?
 - Differences in the medical care received by patients ?



Thank You!

