

**Objectives:** Open surgical repair for thoracoabdominal aortic aneurysm extent IV (TAAA IV) patients was thought to be low risk for morbidity and mortality, especially when compared with more extensive disease found in other variations (ie, extent II). The purpose of this report is to identify patient comorbidities that adversely affect survival in open repair for TAAA IV and to identify candidates suitable for alternative management.

**Methods:** We completed a retrospective analysis of a prospectively collected institutional database of TAAA repairs completed between 1991 and 2010. During this period, our standard protocol for repair evolved to include the spinal protective adjuncts of distal aortic perfusion, passive moderate hypothermia, and perioperative cerebrospinal fluid drainage. Univariate and multivariate analysis were used to determine the effect of adjuncts and patient comorbidities on perioperative neurologic deficits and death.

**Results:** We repaired 1528 TAAA during the study period, including 241 TAAA IV (67% male; mean age, 70 years). Three of 241 patients (1.2%) suffered neurologic deficits such as paraplegia or paraparesis. In 91 of 241 patients, spinal protective adjuncts were not used and did not significantly affect the rate of neurologic deficits. Overall mortality in patients with preserved preoperative renal function (glomerular filtration rate [GFR] >60 mL/min/1.73m<sup>2</sup>) was 10 of 241 (8.3%). However, the 60 patients in the lowest quartile of renal function (GFR <44 mL/min/1.73m<sup>2</sup>) had a mortality of 38.3% (odds ratio [OR], 6.96; 95% confidence interval [CI], 2.43-19.95, *P* < .0001).

**Conclusions:** Poor preoperative renal function is a statistically significant factor that dramatically influences mortality after open TAAA IV repair. Unlike open repair of other TAAA extents, spinal protective adjuncts did not affect the rate of neurologic deficits. TAAA IV patients with poor renal function may be suitable candidates for less invasive options (Table).

Table. Univariate analysis

Variable	Total (%)	Deaths (%)	OR	95% CI	P
GFR $\geq$ 43	60 (24.9)	23 (38.3)	6.96	2.43-19.95	.0001
GFR 44-60	60 (24.9)	7 (11.7)	1.48	0.44-4.95	.74
GFR 61-81	60 (24.9)	5 (8.3)	1.02	0.22-4.69	.98
GFR $\geq$ 82	61 (25.3)	5 (8.2)	1		

#### Intramural Hematoma of the Descending Aorta: Differences and Similarities With Acute B Dissection

Jip L. Tolenaar,<sup>1</sup> Kevin M. Harris,<sup>2</sup> Gilbert R. Upchurch, Jr,<sup>3</sup> Vincenzo Rampoldi,<sup>1</sup> Arturo Evangelista,<sup>4</sup> Frans L. Moll,<sup>5</sup> James B. Froehlich,<sup>6</sup> Marco di Eusanio,<sup>7</sup> Kim Eagle,<sup>6</sup> Santi Trimarchi.<sup>1</sup> <sup>1</sup>Policlinico San Donato IRCCS, Milan, Italy; <sup>2</sup>Minneapolis, Minneapolis, Minn; <sup>3</sup>University of Virginia, Charlottesville, Va; <sup>4</sup>Universitari Vall d'Hebron, Barcelona, Spain; <sup>5</sup>University of Utrecht, Utrecht, Netherlands; <sup>6</sup>University of Michigan, Ann Arbor, Mich; <sup>7</sup>University of Bologna, Bologna, Italy

**Objectives:** Aortic intramural hematoma type B (IMHB) is a relatively rare acute aortic syndrome that presents with symptoms similar to type B aortic dissection (ABAD). Although the natural history of IMHB seems associated with a less malignant course and better results after medical treatment, such observation is not still totally explored. The purpose of this study was to better characterize IMHB, comparing its clinical characteristics and in-hospital and long-term outcome with patients presenting with classic ABAD.

**Methods:** We analyzed 107 IMHB and 790 ABAD patients enrolled in the International Registry of Acute Aortic Dissection (IRAD) between 1996 and 2012. We investigated the differences in presentation, diagnostic, therapy, and outcome between these two cohorts.

**Results:** IMH patients presented at an older age (69.0 vs 62.6 years; *P* < .001) and predominantly in males (61.7%). These patients presented more frequently with chest pain (80.0% vs 68.9%; *P* = .020) and periaortic hematoma (22.1% vs 13.2%; *P* = .020). IMHB patients were more often treated medically (87.9%) than ABAD patients (62.2%; *P* < .001), while endovascular or open surgical management, usually reserved for complicated patients, were more adopted in ABAD (respectively, endovascular, 22.9% vs 6.5%; *P* < .001; open surgical, 14.2% vs 4.7%; *P* = .005). Overall in-hospital mortality was 10.1% (89 patients; IMHB 6.5% vs ABAD 10.6%; *P* = .118) of which six IMHB died during medical treatment, two due to aortic rupture. During follow-up, mortality in IMHB patients was 8.9% and no adverse events were observed.

**Conclusions:** Intramural hematoma of the descending aorta is a serious but rare disease with a relative stable although unpredictable course. Our study confirms that its course is slightly more favorable than classic ABAD in the acute setting. In the absence of suitable predictors for high-risk patients, a complication-specific approach should be adopted. Medical treatment combined with adequate follow-up should be administered in all patients, reserving endovascular or surgical intervention for complicated patients (Table).

Table.

Category	Type B		P value
	True IMH N=107	Classic AoD N=790	
<b>Demographics</b>			
Age (mean $\pm$ SD)	69.0 $\pm$ 12.3	62.6 $\pm$ 14.1	<.001
Gender - male	66 (61.7%)	528 (66.8%)	.290
Race - non-white	10 (9.6%)	127 (16.9%)	.058
<b>Symptoms</b>			
Chest pain	84 (80.0%)	527 (68.9%)	.020
Back pain	84 (78.5%)	527 (69.8%)	.064
Abdominal pain	36 (35.0%)	325 (43.6%)	.097
Radiating pain	36 (35.3%)	332 (44.9%)	.068
Abrupt onset of pain	84 (81.6%)	653 (87.4%)	.100
<b>Complications</b>			
Periaortic hematoma	23 (22.1%)	104 (13.2%)	.020
Shock	0 (0%)	9 (1.2%)	.259
Mesenteric ischemia/infarction	0 (0%)	49 (6.6%)	.008
Spinal cord ischemia	0 (0%)	12 (1.7%)	.201
Acute renal failure	9 (9.0%)	115 (15.5%)	.086
Limb ischemia	0 (0%)	75 (10.1%)	.001
<b>Management</b>			
Medical management	94 (87.9%)	491 (62.2%)	<.001
Endovascular management	7 (6.5%)	181 (22.9%)	<.001
Surgical management	5 (4.7%)	112 (14.2%)	.005
Hybrid management	1 (0.9%)	6 (0.8%)	.590
<b>Outcome</b>			
In-hospital mortality	7 (6.5%)	84 (10.6%)	.188
Mortality after 1 year	4 (8.9%)	19 (6.9%)	.547

#### Outcomes of Open and Endovascular Repair for Ruptured and Non-ruptured Internal Iliac Artery Aneurysms

Muhammad A. Rana, MD, Manju Kalra, MD, Gustavo S. Oderich, MD, Peter Gloviczki, MD, Audra Duncan, MD, Mark D. Fleming, MD, Thomas C. Bower, MD. Mayo Clinic, Rochester, Minn

**Objectives:** This study evaluated outcomes of open and endovascular repair (EVAR) of internal iliac artery (ILA) aneurysms (IIAAs) with or without preservation of IIA flow.

**Methods:** We reviewed the clinical data of consecutive patients treated for IIAAs between 2001 and 2012. End points were morbidity, mortality, graft patency, and freedom from pelvic ischemic symptoms (hip claudication, ischemic colitis, and spinal cord injury).

**Results:** There were 64 patients (57 men, 7 women) with mean age of 73 years (range, 52-90 years). Seventy-eight IIAAs (36 unilateral and 28 bilateral) were treated. Fifty-five patients (86%) had elective repair (mean size, 3.0  $\pm$  1.2 cm) and nine (14%) required emergent repair (mean size, 6.7  $\pm$  2.4; range, 3.6-10 cm). Open repair in 48 patients (75%; 43 elective, 5 emergent) included IIA bypass in 38 or endoaneurysmorrhaphy in 10, combined with aortoiliac reconstruction in 40. EVAR in 16 patients (25%; 12 elective, 4 emergent) required IIA coil embolization in 11, iliac branch device in three, or IIA bypass in two, combined with bifurcated aortic stent grafts in eight. Early mortality was 1.8% for elective (1 of 43 open, 0 of 12 endovascular) and 11% for emergent repair (1 of 5 open, 0 of 4 endovascular; *P* = NS). Early morbidity and length of stay were significantly (*P* < .05) higher for open repair (39%, mean 9.7  $\pm$  4.3 days) than for EVAR (12%; mean 4  $\pm$  4.8 days). Pelvic ischemic complications occurred in 11 patients (17%), including hip claudication in eight, ischemic colitis in two, paraplegia in one. Pelvic ischemic complications occurred in 11 patients (25%) who had exclusion of at least one IIA, and in none of the patients with bilateral IIA preservation (*P* < .03). There was no difference in pelvic ischemic complications for elective (16%) vs emergent repair (22%) nor for open repair (13%) vs EVAR (24%). After a mean follow-up of 2.4 years, primary and secondary patency rates of IIAA bypasses were 95%. Freedom from pelvic ischemic complications at 2 years was 100% for patients with two patent IIAs and 75%  $\pm$  8% for those who had at least one IIA excluded (*P* = .05).

**Conclusions:** Endovascular repair of IIAAs is associated with fewer complications and shorter hospital stay than with open repair. Patency of IIA bypasses is excellent. Patients who had preservation of IIA flow with bypass or iliac branch device developed no pelvic ischemic symptoms.

#### Functional Outcome and Mortality After Open and Endovascular Secondary Intervention for Thoracic Endovascular Aortic Repair

Khayree Butler, MD, Salvatore T. Scali, MD, Adam W. Beck, MD, Robert J. Feezor, MD, Peter R. Nelson, MD, MPH, Scott A. Berceci, MD, PhD, Thomas S. Huber, MD, PhD, Catherine K. Chang, MD. University of Florida-Gainesville, Gainesville, Fla

**Objectives:** Results of thoracic endovascular aortic repair (TEVAR) have demonstrated improved morbidity and short-term mortality compared