Acute Aortic Intramural Hematoma

An Analysis From the International Registry of Acute Aortic Dissection

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Background—Acute aortic intramural hematoma (IMH) is an important subgroup of aortic dissection, and controversy surrounds appropriate management.

Methods and Results—Patients with acute aortic syndromes in the International Registry of Acute Aortic Dissection (1996–2011) were evaluated to examine differences between patients (based on the initial imaging test) with IMH or classic dissection (AD). Of 2830 patients, 178 had IMH (64 type A [42%], 90 type B [58%], and 24 arch). Patients with IMH were older and presented with similar symptoms, such as severe pain. Patients with type A IMH were less likely to present with aortic regurgitation or pulse deficits and were more likely to have periaortic hematoma and pericardial effusion. Although type A IMH and AD were managed medically infrequently, type B IMH were more frequently treated medically. Overall in-hospital mortality was not statistically different for type A IMH compared to AD (26.6% versus 26.5%; P=0.998); type A IMH managed medically had significant mortality (40.0%), although less than classic AD (61.8%; P=0.195). Patients with type B IMH had a hospital mortality that was less but did not differ significantly (4.4% versus 11.1%; P=0.062) from classic AD. One-year mortality was not significantly different between AD and IMH.

Conclusions—Acute IMH has similar presentation to classic AD but is more frequently complicated with pericardial effusions and periaortic hematoma. Patients with IMH have a mortality that does not differ statistically from those with classic AD. A small subgroup of type A IMH patients are managed medically and have a significant in-hospital mortality. (Circulation. 2012;126[suppl 1]:S91–S96.)

Key Words: aortic dissection ■ diagnosis ■ imaging ■ aortic surgery ■ aortic intramural hematoma

Aortic intramural hematoma (IMH) is an important acute aortic syndrome that presents with symptoms similar to those of classic (typical) aortic dissection (AD). Although classic dissection is characterized by an intimal flap with 2 lumens, IMH is typically recognized by preoperative imaging techniques by crescentic or, in some cases, circumferential thickening of the aortic wall without imaging evidence of an entry point. In early reports, a high morbidity and mortality similar to AD were noted.1–4 More recent series, primarily from Japan and Korea, have suggested a higher incidence of IMH compared with AD (>20% in some series) and good results with medical therapy alone.5,6 Most series have been relatively small, based on individual hospitals or small collections of hospitals.7 The International Registry of Acute Aortic Dissection (IRAD) represents a multinational group of investigators that have collected >3200 cases of acute aortic syndrome, allowing an opportunity to relook at the presentation, management, and outcome of patients with IMH compared with those with classic AD.8

Methods

IRAD Registry

The IRAD registry represents an investigational collaboration that has collected information on unselected consecutive cases of acute aortic syndrome occurring at 30 aortic referral centers in 10 countries since January 1, 1996.5 Its inception and structure have been described previously.3 Institutional review board approval was obtained at each site. A preliminary report of 58 cases from IRAD regarding IMH was published previously in 2005, but, given the intervening time frame, we took this opportunity to relook at the IRAD IMH patients.9
Table 1. Demographics and Patient History

<table>
<thead>
<tr>
<th>Category</th>
<th>Type A (n=1808)</th>
<th>Type B (n=741)</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dissection type</td>
<td>IMH</td>
<td>Classic AoD</td>
<td>P Value</td>
</tr>
<tr>
<td>Type A</td>
<td>64 (41.6%)</td>
<td>1744 (72.8%)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Type B</td>
<td>90 (58.4%)</td>
<td>651 (27.2%)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Age (mean±SD)</td>
<td>69.6±9.6</td>
<td>61.4±14.6</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Gender-male</td>
<td>37 (57.8%)</td>
<td>1180 (67.7%)</td>
<td>0.099</td>
</tr>
<tr>
<td>Time presentation to diagnosis (hrs) median (Q1-Q3)</td>
<td>4.2 (1.5 to 21.5)</td>
<td>3.9 (1.5 to 19.2)</td>
<td>1.000</td>
</tr>
<tr>
<td>Race–non-white</td>
<td>2 (3.4%)</td>
<td>170 (10.4%)</td>
<td>0.079</td>
</tr>
<tr>
<td>Identified at NA site</td>
<td>25 (39.1%)</td>
<td>880 (52.1%)</td>
<td>0.044</td>
</tr>
<tr>
<td>Identified at European site</td>
<td>39 (60.9%)</td>
<td>768 (45.5%)</td>
<td>0.002</td>
</tr>
<tr>
<td>Identified at Japanese site</td>
<td>0 (0.0%)</td>
<td>40 (2.4%)</td>
<td></td>
</tr>
<tr>
<td>Patient history</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hypertension</td>
<td>52 (81.3%)</td>
<td>1204 (71.2%)</td>
<td>0.079</td>
</tr>
<tr>
<td>Marfan syndrome</td>
<td>0 (0.0%)</td>
<td>77 (4.6%)</td>
<td>0.112</td>
</tr>
<tr>
<td>Known aortic aneurysm</td>
<td>14 (21.9%)</td>
<td>200 (12.0%)</td>
<td>0.018</td>
</tr>
<tr>
<td>Prior AoD</td>
<td>2 (3.1%)</td>
<td>56 (3.4%)</td>
<td>1.000</td>
</tr>
</tbody>
</table>

IMH indicates intramural hematoma; AoD, aortic dissection; and NA, North American.

Data Collection and Measures

Comprehensive clinical information was collected using a 338-item data collection form at presentation or via physician review of records. A separate follow-up 131-item form is filled out at 6 months and annually by participating centers.

Patients with acute aortic syndrome enrolled in IRAD from January 1, 1996, to February 25, 2011, were included in this analysis (n=2830). Type A dissection represents any dissection involving the ascending aorta. For purposes of this analysis, those patients with the most proximal extent of dissection in the arch were analyzed separately from those classified as type A or type B.

Patients were classified as either classic AD or IMH based on the initial imaging study. If there was concomitant mention of both IMH and an intimal flap or double lumen, they were included in the AD group. If patients evolved to classic AD on subsequent imaging, they were maintained in the IMH group. Patients with IMH were then contrasted with those with AD with regards to demographics, presenting symptoms and signs, management, and outcomes.

Statistical Analysis

Categorical variables were compared using χ² tests (or Fisher exact tests where appropriate). Continuous variables were compared using Student t test for normally distributed data or nonparametric test of medians for data with skewed distributions. SPSS version 19.0 was used for all of the analyses. Analyses were performed separately for type A and type B.

Results

During the study interval, IMH was identified in 178 cases (6.3%), and classic dissection was identified in 2652. IMH and AD occurred in 64 (3.5%) and 1744 (96.5%) of the type A patients and 90 (12.1%) and 651 (87.9%) of type B cases and the arch in 24 (8.5%) and 257 (91.5%). Thus, in contrast to classic AD, which principally involves the ascending aorta (73% type A and 27% type B), IMH involves the descending aorta preferentially (42% type A and 58% type B; P<0.001). The incidence of IMH among IRAD sites varied between 0% and 25% of cases of acute aortic syndromes. IMH was more likely to be diagnosed in Europe compared with the United States (type A IMH, Europe 4.8% versus 2.8%, P=0.044; type B IMH, 17.3% versus 9.0%; P=0.002). Of IMH patients, 60.2% were identified at an IRAD center (rather than a community referring hospital) versus 39.7% of AD patients diagnosed at the IRAD site (P<0.001).

As shown in Table 1, patients with IMH were similar to those with AD with regard to demographic and historical variables. However, those with IMH were older, and those with type A IMH were more likely to have a known aortic aneurysm. The majority of patients with both IMH and AD had symptoms of chest pain, frequently severe and abrupt in onset (Table 2). Those patients with type A IMH were less likely than those with AD to present with aortic regurgitation, and patients with IMH overall were less likely to present with pulse deficits.

The EKG was more frequently normal in type A IMH than in AD (Table 3). Patients with IMH and AD had similar time from presentation to diagnosis. In a small subset of patients undergoing MRI, patients were more likely to have IMH of the ascending established than AD. Aortic size was similar between IMH and AD. Patients with both type A and B IMH were more likely to have periaortic hematoma than those with AD. Sixty percent of those with type A IMH had pericardial effusions, a finding seen less frequently with AD.

Patients with type A IMH were managed medically 15.6% of the time; and although more frequent than patients with AD, the difference did not reach statistical significance (Table 4). In those patients going to surgery, the time to surgery was similar for both IMH and classic AD. Patients with type B IMH also were more likely than those with AD to be managed medically than with surgical or endovascular techniques. Overall hospital mortality for patients with type A IMH was not statistically different from those with AD and held true for those treated medically and those treated surgically.

Although mortality for type B IMH was less than of type B AD, the difference did not reach statistical significance.
The type A IMH group was older (68.7 versus 60.2 years of age; P<0.001) and had more frequent pericardial effusions (67% versus 43%; P<0.001) and periaortic hematoma (46% versus 21%; P<0.001). Mortality for type B IMH was similar to that of type B AoD. In patients in whom 1-year follow-up data were available, mortality was not significantly different.

Ten patients with type A IMH were treated medically (median age, 74.8 years [range, 61.7–80.7 years]; Table 6). Of type A IMH patients being managed medically, the mortality was 40%, which was (not significantly) less than that for AD treated medically (62%) but was still substantial. Pericardial effusion (30%) and periaortic hematoma (50%) were present in this group, and hospital deaths occurred in patients with and without these features. Of patients dying (1 because of progression to typical dissection and mesenteric ischemia and 3 with rupture), death occurred at a median and interquartile range of 1.4 days (0.4–4.9 days) from presentation. Thus, 6 medically managed type A IMH patients survived to discharge with a median hospital stay of 12.2 days.

### Table 2. Presenting Symptoms/Signs of Aortic Dissection

<table>
<thead>
<tr>
<th>Category</th>
<th>Type A (n=1808)</th>
<th>Type B (n=741)</th>
</tr>
</thead>
<tbody>
<tr>
<td>IMH</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chest pain</td>
<td>64</td>
<td>60 (1808)</td>
</tr>
<tr>
<td>Back pain</td>
<td>25</td>
<td>70 (741)</td>
</tr>
<tr>
<td>Abdominal pain</td>
<td>8</td>
<td>32 (741)</td>
</tr>
<tr>
<td>Pain severity–severe or worst ever</td>
<td>52 (98.1%)</td>
<td>72 (94.7%)</td>
</tr>
<tr>
<td>Radiating pain</td>
<td>28 (45.9%)</td>
<td>30 (35.3%)</td>
</tr>
<tr>
<td>Abrupt onset of pain</td>
<td>52 (86.7%)</td>
<td>71 (82.6%)</td>
</tr>
<tr>
<td>Presenting hypertensive</td>
<td>19 (32.2%)</td>
<td>51 (58.6%)</td>
</tr>
<tr>
<td>Presenting hypotensive</td>
<td>7 (11.9%)</td>
<td>2 (3.3%)</td>
</tr>
<tr>
<td>Presented with aortic regurgitation</td>
<td>19 (35.2%)</td>
<td>8 (10.3%)</td>
</tr>
<tr>
<td>Presented with pulse deficits</td>
<td>8 (15.1%)</td>
<td>6 (7.6%)</td>
</tr>
</tbody>
</table>

IMH indicates intramural hematoma; and AoD, aortic dissection.

### Table 3. Imaging

<table>
<thead>
<tr>
<th>Category</th>
<th>Type A (n=1808)</th>
<th>Type B (n=741)</th>
</tr>
</thead>
<tbody>
<tr>
<td>IMH</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CXR done</td>
<td>50 (78.1%)</td>
<td>83 (92.2%)</td>
</tr>
<tr>
<td>CXR normal</td>
<td>7 (14.0%)</td>
<td>24 (28.9%)</td>
</tr>
<tr>
<td>ECG done</td>
<td>63 (98.4%)</td>
<td>85 (94.4%)</td>
</tr>
<tr>
<td>ECG normal</td>
<td>30 (47.6%)</td>
<td>30 (35.3%)</td>
</tr>
<tr>
<td>TEE done</td>
<td>46 (71.9%)</td>
<td>47 (52.2%)</td>
</tr>
<tr>
<td>TEE normal</td>
<td>1 (2.2%)</td>
<td>3 (6.4%)</td>
</tr>
<tr>
<td>CT done</td>
<td>55 (85.9%)</td>
<td>84 (93.3%)</td>
</tr>
<tr>
<td>CT normal</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
</tr>
<tr>
<td>AG done</td>
<td>2 (3.1%)</td>
<td>5 (5.6%)</td>
</tr>
<tr>
<td>MRI done</td>
<td>9 (14.1%)</td>
<td>16 (17.8%)</td>
</tr>
<tr>
<td>MRI normal</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
</tr>
<tr>
<td>No. of imaging studies performed (median (Q1–Q3))</td>
<td>2 (1–2)</td>
<td>2 (1–2)</td>
</tr>
<tr>
<td>IMH identified at referring hospital</td>
<td>19 (40.4%)</td>
<td>26 (39.4%)</td>
</tr>
<tr>
<td>IMH identified at tertiary hospital</td>
<td>28 (59.6%)</td>
<td>40 (60.6%)</td>
</tr>
<tr>
<td>Peri-aortic hematoma identified on any imaging study</td>
<td>26 (46.4%)</td>
<td>20 (26.0%)</td>
</tr>
<tr>
<td>Pericardial effusion identified on any imaging study</td>
<td>38 (61.3%)</td>
<td>6 (7.6%)</td>
</tr>
<tr>
<td>Aortic root (median (Q1–Q3))</td>
<td>4.0 (3.3 to 4.8)</td>
<td>3.4 (3.1 to 4.0)</td>
</tr>
<tr>
<td>Ascending aorta (median (Q1–Q3))</td>
<td>4.9 (4.3 to 5.5)</td>
<td>3.8 (3.4 to 4.5)</td>
</tr>
<tr>
<td>Descending aorta (median (Q1–Q3))</td>
<td>3.4 (3.0 to 4.0)</td>
<td>4.0 (3.4 to 4.8)</td>
</tr>
</tbody>
</table>

IMH indicates intramural hematoma; AoD, aortic dissection; CXR, chest x-ray; ECG, electrocardiogram; TEE, transesophageal echo; CT, computed tomography; AG, Aortogram; and MRI, magnetic resonance imaging.
In patients surviving to 1 year, 1 of 6 crossed over to surgery. Thus, of the medically managed group, 4 remained free of surgery or death at intermediate to long-term follow-up.

Twenty-four patients had the most proximal extension of IMH in the arch. Of the 24 patients with arch as the site of most proximal extension of IMH, 16 were medically managed, 4 were surgically managed, 2 were managed with endovascular therapy, and 2 had hybrid management. There were 3 deaths (12.5%) in the population.

### Discussion

This study of 178 patients with IMH, one of the largest studies of IMH to date, allows a contemporary profile of the current presentation, management, and outcomes. The multinational nature of IRAD allows a broad overview of a condition that, to date, has been documented only in small single institution or regional series. In this analysis, aortic IMH represents 6.3% of patients in the IRAD registry, and several facets of the clinical presentation, as well as the hospital and 1-year outcome of patients with IMH does not differ statistically from those of classic AD.

In this study, as shown previously, patients with IMH are older,<sup>9,10</sup> but present with a nearly indistinguishable clinical, demographic, and historical variables and symptoms compared with patients with AD. Patients with IMH are less likely to develop aortic regurgitation, pulse deficits, or coronary involvement (as evident by EKG normality). Given the proximity of the IMH to the adventitia, these patients are more likely to develop periaortic hematoma and pericardial effusion and may be prone to rupture.<sup>4,10,11</sup> Periaortic hematoma may be a marker of increased risk of rupture.<sup>11</sup> Indeed, in our series, 3 of the deaths with medically managed type A IMH patients were related to rupture. Although not a first-line test for dissection, MRI may be particularly suitable for the diagnosis (and follow-up of IMH),<sup>12</sup> thus the higher incidence of MRI being performed for diagnosis in this group as compared with those with AD.

Some series describe IMH as representing 10% to 30% of their acute aortic cases,<sup>5–7,10,13</sup> and thus the incidence of 6.3% seen here is lower than anticipated. The variability between IRAD centers and between the US and Europe cohorts of IRAD may highlight that, even internally within IRAD, there may be differences in the recognition of IMH. The IRAD

<table>
<thead>
<tr>
<th>Table 4. Management</th>
</tr>
</thead>
<tbody>
<tr>
<td>Category</td>
</tr>
<tr>
<td>Medical management</td>
</tr>
<tr>
<td>Surgical management</td>
</tr>
<tr>
<td>Time from diagnosis to surgery (median hours (Q1-Q3))</td>
</tr>
<tr>
<td>Time for diagnosis to surgery &gt;48 hours</td>
</tr>
<tr>
<td>Ascending aortic replacement</td>
</tr>
<tr>
<td>Aortic root replacement</td>
</tr>
<tr>
<td>Descending aortic replacement</td>
</tr>
<tr>
<td>Endovascular management</td>
</tr>
<tr>
<td>Hybrid management</td>
</tr>
</tbody>
</table>

IMH indicates intramural hematoma; and AoD, aortic dissection.

<table>
<thead>
<tr>
<th>Table 5. Outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Category</td>
</tr>
<tr>
<td>In-hospital mortality</td>
</tr>
<tr>
<td>Medical management</td>
</tr>
<tr>
<td>Surgical management</td>
</tr>
<tr>
<td>Surgery within 24 hours of presentation</td>
</tr>
<tr>
<td>Surgery after 48 hours</td>
</tr>
<tr>
<td>Post-procedural complications*</td>
</tr>
<tr>
<td>1-y follow-up</td>
</tr>
<tr>
<td>Mortality</td>
</tr>
<tr>
<td>Medical management–mortality</td>
</tr>
<tr>
<td>Aortic enlargement found on imaging</td>
</tr>
</tbody>
</table>

IMH indicates intramural hematoma; and AoD, aortic dissection.

*Post-procedural complications include cerebrovascular accident, coma, spinal chord ischemia, mesenteric ischemia, tamponade and renal failure.
definition of IMH is quite strict, and we suspect in some centers that IMH cases would be characterized as dissections with thrombosed false lumen or typical dissections. Certainly one reason for the low incidence is the tertiary nature of IRAD centers, because patients arriving at the tertiary centers may have developed typical AD by the time of arrival.9,14 It is possible that IMH, especially those patients with more subtle wall thickening, may go unrecognized at community hospitals referring to IRAD centers. This is supported by the more frequent detection of IMH at the tertiary IRAD centers. It is not unexpected that many of the single-center studies reported previously have a special interest in this condition, and recognition at these sites may be higher than in the worldwide community. In this regard, the IRAD findings may best demonstrate the real world variability in recognition of this condition and reflect real world experience.

Since the very initial small series,1–4 debate has arisen as to the optimal management of type A IMH. Although previous meta-analyses have shown superiority of surgical management of type A IMH,7,12 a strategy of initial medical management has more recently been advocated by some, especially from Asian sites.5,6,13 Most of these Asian studies showed a much higher frequency of IMH as a percentage of acute aortic syndromes and used a more common strategy of initial medical management.5–7 Based on these data, this strategy of initial medical management has not been adopted by IRAD sites. Although small in total number of medically managed patients, the risk of pericardial effusion, periaortic hematoma, and the 40% inpatient mortality would suggest this may reduce overall mortality in this condition. Many predictors of complications of IMH, such as aortic diameter, wall thickness, and absence of ß-blockade, have been proposed as a way of predicting progression toward untoward complications.5,11,14,15 Although wall thickness is not measured in the IRAD database, the remaining predictors, as demonstrated here and previously, are not perfect in identifying patients at risk for rapid demise.

The surgical mortality of type A IMH did not differ significantly from AD and, thus, is higher than anticipated and may be related to a selection bias leading to a higher-risk cohort. Thus, in comparison with AD, where surgery was the treatment of choice, in IMH, surgery was indicated more frequently in complicated cases, including periaortic hematoma and pericardial effusion.

In contrast to type A IMH, type B IMH appears to have a slightly more benign prognosis than type B AD.3 These patients generally respond to initial medical therapy and successfully avoid surgical and endovascular repair. Indeed, type B IMH patients compose the group in which regression is most often seen.11 The number of arch IMH cases observed has not been described previously and remains unexplained. This group does have a slightly higher mortality and procedural rate than type B IMH.

The data shown here highlight the significant risk associated with IMH and would support treatment algorithms for this condition identical to that of typical AD (surgery for type A surgical candidates and close monitoring of type B IMH unless traditional surgical indications are present). It is hoped that increasing recognition of IMH by clinicians and those

### Table 6. Medically Managed Type A Intramural Hematoma

<table>
<thead>
<tr>
<th>Patient</th>
<th>Most Proximal Extension IMH</th>
<th>Age</th>
<th>Race</th>
<th>Ascending Aorta Diameter</th>
<th>Beta-Blocker Listed With Initial Meds</th>
<th>Pericardial Effusion (y/n)</th>
<th>Per-Aortic Hematoma (y/n)</th>
<th>Progression to Dissection Seen on Imaging Study?</th>
<th>In-Hospital Outcome</th>
<th>Longest Term Follow-Up</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Root</td>
<td>68.5</td>
<td>White</td>
<td>5 cm</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>Mortality (rupture)</td>
<td>n/a</td>
</tr>
<tr>
<td>2</td>
<td>Sinotubular junction</td>
<td>81.0</td>
<td>White</td>
<td>4.5 cm</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>Mortality (rupture)</td>
<td>n/a</td>
</tr>
<tr>
<td>3</td>
<td>Sinotubular junction</td>
<td>81.7</td>
<td>White</td>
<td>6.5 cm</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>Discharged</td>
<td>6 mo, new dissection noted at 6 mo, alive at 2.75 y</td>
</tr>
<tr>
<td>4</td>
<td>Ascending</td>
<td>74.8</td>
<td>White</td>
<td>9 cm</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>Mortality (rupture)</td>
<td>n/a</td>
</tr>
<tr>
<td>5</td>
<td>Ascending</td>
<td>76.9</td>
<td>n/a</td>
<td>n/a</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Mortality (mesenteric infarction)</td>
<td>n/a</td>
</tr>
<tr>
<td>6</td>
<td>Ascending</td>
<td>76.9</td>
<td>White</td>
<td>5.6 cm</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>Discharged</td>
<td>2 y (death related to dissection extension)</td>
</tr>
<tr>
<td>7</td>
<td>Ascending</td>
<td>69.5</td>
<td>White</td>
<td>4.2 cm</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>Discharged</td>
<td>Alive, 2.5 y</td>
</tr>
<tr>
<td>8</td>
<td>Ascending</td>
<td>72.3</td>
<td>n/a</td>
<td>5.1 cm</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>Discharged</td>
<td>Conversion to surgery at 1 y, alive at 4 y</td>
</tr>
<tr>
<td>9</td>
<td>Ascending</td>
<td>81.4</td>
<td>White</td>
<td>5.0 cm</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>Discharged</td>
<td>5 y, increased aortic diameter noted</td>
</tr>
<tr>
<td>10</td>
<td>Ascending</td>
<td>78.8</td>
<td>White</td>
<td>4.8 cm</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>Discharged</td>
<td>5 y</td>
</tr>
<tr>
<td>Summary</td>
<td>Ascending=7</td>
<td>Median: 74.8</td>
<td>White=8</td>
<td>5.5±1.5</td>
<td>Yes=7</td>
<td>Yes=3</td>
<td>Yes=5</td>
<td>Yes=3</td>
<td>Mortality=4</td>
<td></td>
</tr>
<tr>
<td></td>
<td>STJ=2</td>
<td>IQR: (61.7 to 80.7)</td>
<td>n/a=1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

IMH indicates intramural hematoma; STJ, sinotubular junction; and IQR, interquartile range.
interpreting imaging studies would emphasize the potential lethality of the condition. Continued study into management strategies of type A IMH may allow for better prediction of outcomes for certain subsets.

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References
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