



# Uncomplicated type A intramural hematoma: surgery or conservative approach? – conservative approach

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Submitted Apr 01, 2019. Accepted for publication Jun 20, 2019.

doi: 10.21037/acs.2019.06.10

View this article at: <http://dx.doi.org/10.21037/acs.2019.06.10>

In this article, “intramural hematoma (IMH)” is defined as the entity including both the original/pathological lesion of the aortic media without any primary entry (intimal tear) and the radio-/echo-graphical condition with the false lumen (FL) of aortic dissection (AD) completely thrombo-occluded (excluding partially thrombosed) with or without a clearly-demonstrated intimal tear on imaging. The treatment strategies for IMH depend on the location of the IMH, the degree/thickness of the IMH, and the presence of coexisting critical sequelae of acute type A AD, such as pericardial effusion (PE)/cardiac tamponade, rupture, significant aortic regurgitation, and organ malperfusion. The patient’s comorbidities and age also should be assessed when considering emergent/urgent open aortic repairs. The initial treatment strategies for type A IMH are discussed, focusing on the conventional approach for “uncomplicated” type A IMH.

The surgical indication for acute type A IMH remains controversial, because its natural history is more variable, compared with acute type B IMH. The ACCF/AHA guideline in 2010 and the ESC guidance in 2014 recommend emergency open aortic repair, particularly for “complicated” type A IMH with the above-described critical sequelae of acute type A AD (1,2). However, surgical indications for “uncomplicated” type A IMH remain unclear with no indications described in either guideline. In the literature, mortality rates of medically-treated patients in the European and American series are higher (3-5), compared with the Asian series (6-8). The reasons for this are not clear, however, they might be due to differences in the medical care systems and medical treatments offered between the American/European and Asian countries. In

Japan, there are over 580 cardiovascular surgical centers in the country, including 42 hospitals in the small and crowded area of Tokyo where emergency medical and surgical treatments for acute AD are feasible.

For patients not requiring urgent surgical treatments, the conservative “wait-and-watch strategy” is appropriate, this includes optimal medical therapy with blood pressure and pain control and with appropriate serial imaging. Optimal medical treatment is directed at decreasing aortic wall stress by controlling heart rate and blood pressure as followed; intravenous beta blockade or calcium channel-blocking agents are given and titrated to a target heart rate of 60 bpm or less. If the systolic blood pressures remains greater than 120 mmHg after adequate heart rate control, angiotensin-converting enzyme inhibitors and/or other vasodilators are administered intravenously. With this conservative wait-and-watch strategy, the FL hematoma may resolve in some instances. However, in other patients the IMH may convert to a classical (double-barrel) AD or the aorta may dilate with thickening of the FL, in particular, during the initial 24–48 h (3-5). An ulcer-like-projection (ULP) cause by a small intimal tear sometimes appears in the thrombo-occluded FL. Such a conversion or change of AD pattern would be associated with serious sequelae following acute type A AD.

Type A IMH tends to have a higher incidence of the above complications due to higher wall stress and tension on the ascending aorta compared with more stable type B IMH. The risk of conversion to classical type A AD despite optimal medical management is particularly high in patients with a dilated aorta to 48–50 mm or with an IMH thickness of 11 mm (6-8). In this settings, the initial

treatment should be emergent or urgent surgery for most patients without extremely-high surgical risks. Interestingly, Uchida *et al.* demonstrated higher incidences of PE/cardiac tamponade in type A IMH compared with a classical type A AD (9). Pathology of aortic specimens collected at surgery revealed that AD tended to occur in the media closer to the adventitia. In other words, the actual incidence of “uncomplicated” type A IMH without PE might be lower. In cases with more than a moderate amount of PE and without the above surgical criteria of over 50 mm in aortic diameter and 11 mm of IMH thickness, pericardial drainage would be a useful treatment option particularly for high-risk or inoperable patients to improve the hemodynamics and preventing cardiac tamponade, thus avoiding more invasive open repairs (10).

In the conservative, wait-and-watch approach the interval of imaging evaluation is also important. However, there have been no clear recommendations for the appropriate interval guidelines. We believe that initial surveillance imaging should be carried out within 24 hours of the initial investigation, because AD is unstable during the super-acute phase of the first 24–48 h. Fortunately, the IMH thickness is easily recognized even in non-enhanced CT-scans. However, during this phase, conversion from IMH to IMH with a ULP or to classical AD can potentially occur. In cases with enlarged ascending aorta or thickened IMH, if possible, contrast enhanced CT-scan is recommended to demonstrate all features clearly at the second assessment.

In cases with ‘uncomplicated’ type A IMH with the maximum aortic diameter less than 50 mm and the IMH thickness less than 11 mm, the first line treatment might be a wait-and-watch strategy as determined by a multidisciplinary aorta team including sufficient surgical support. However, during conservative treatment, the occurrence of critical sequelae such as PE/cardiac tamponade, rupture, significant aortic regurgitation, and organ malperfusion, or further dilatation of the aorta over 50 mm and/or extension of IMH over 11 mm, change of treatment strategy to urgent open aortic repair is recommended.

### Acknowledgments

None.

### Footnote

*Conflicts of Interest:* The author has no conflicts of interest to declare.

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**Cite this article as:** Ogino H. Uncomplicated type A intramural hematoma: surgery or conservative approach? — conservative approach. *Ann Cardiothorac Surg* 2019;8(5):558-560. doi: 10.21037/acs.2019.06.10