

Thrombosed Type A Acute Aortic Dissection Quick Overview of a Clinical Variant of Aortic Dissection

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Abstract

Thrombosed type A acute aortic dissection (TAAAD) is a subtype of aortic dissection. The computed tomography shows a crescent-shaped false lumen with neither entry nor blood flow in the false lumen. Clinical characteristics of TAAAD are sometimes different from those of the classical aortic dissection. The worst scenario is the progression to classical aortic dissection, which means recanalization of the false lumen, frank rupture, or aneurysmal formation is worse clinical manifestations. On the other hand, spontaneous regression of the false lumen leading to the disappearance of the aortic dissection is the best course. Optimal strategy for TAAAD still remains debatable. One of the reasons is the international differences in the outcomes of TAAAD. In the Western countries, the patients treated with emergent operation had lower mortality than those treated with medical therapy. On the other hand, in Asian countries, favorable outcomes have been demonstrated in the strategy of medical therapy alone for uncomplicated patients or medical therapy plus timed surgery for complicated patients. On Japanese guidelines for aortic dissection issued in 2011, the surgical treatment for TA AAD is indicated for the patients with cardiac tamponade, aortic regurgitation (AR), large ascending aorta (>50 mm) and thick thrombosed false lumen (>11 mm). The initial medical therapy is selected for patients who do not have the surgical criteria. Once selected, close inspection of the patient and repetitive radiographic follow-up are needed to detect the propagation of aortic dissection rapidly. We should rediscover the fact that thrombosed type A acute aortic dissection belongs to the "acute aortic syndrome" and is likely to progress to the overt aortic dissection or aortic rupture. The optimal selection of the initial treatment according to the risk stratification can improve the outcomes of this unique disease.

Thrombosed type A acute aortic dissection (TA AAD) is a particular type of aortic dissection. The incidence of TA AAD is not uncommon disease, and it ranges from 3 to 33 % in overall cases of type A AAD [1-6]. Recently, TA AAD has been detected more frequently by the aid of advanced imaging devices. The computed tomographic finding of this disease is a crescent-shaped false lumen without any entry sites and obvious blood flow in the false lumen. The pathogenesis of TA AAD remains unclear. Spontaneous rupture of the aortic vasa vasorum is one of the pathogenic mechanisms for so-called "aortic dissection without tear" or "intramural hematoma (IMH)", which was mainly proposed in the western countries [7]. Another mechanism is the false lumen thrombosis rapidly after the intimal tear develops probably due to lack of re-entry. Recently, Park and associates showed that a large proportion of IMH had intimal tear at ascending aorta or arch, which is the same pathogenesis as classical aortic dissection [8].

Clinical characteristics of TA AAD are sometimes different from those of the classical aortic dissection. The differences contribute to the status of the false lumen. The worst scenario of the TA AAD is the progressive course to overt aortic dissection (recanalization), or frank rupture, or aneurysmal formation. On the other hand, the best-case scenario is spontaneous regression of the false lumen leading to the disappearance of the aortic dissection (the disappearance rate of false lumen accounted for 40-71% [9-11]), which never seen in the classic dissection. On the basis of the worst scenario, TA AAD may be equally considered to be the potentially lethal aortic disease as the classical aortic dissection.

The classical type A AAD generally requires emergent graft replacement including entry resection to prevent catastrophic clinical events such as aortic rupture or organ ischemia. In contrast, the optimal strategy for TA AAD still remains debatable. One of the reasons is the significant international differences in the outcomes of TA AAD [12-14]. In Asian countries, particularly in Japan and Korea, favorable results have been reported in the strategy of medical therapy alone

for uncomplicated patients or medical therapy and timed surgical intervention for complicated patients. Kan and coworkers analysed a total of 328 cases in 12 studies of type A IMH, demonstrating that the early mortality rate was not statistically different between surgical treatment group and medical treatment group (10.1% vs14.4%, respectively, $p=0.37$) [13]. On the other hand, in the Western countries, the patients treated with emergent operation had better prognosis than those treated with medical therapy. The International Registry of Acute Aortic Dissection (IRAD) report showed the in-hospital mortality of patients with type A acute aortic IMH treated by medically (40%) was higher than those treated by surgically (24.1%) [6]. Attia et al. [14] reported the meta-analysis regarding the therapeutic strategy for acute aortic IMH, showing that the emergent surgical treatment resulted in lower 30-day mortality compared with medical management (14% vs. 36%, respectively, $p=0.02$). The treatment strategy is determined under the consideration of clinical presentations and radiographic findings. On Japanese guidelines for diagnosis and treatment of aortic aneurysm and aortic dissection issued by the Japanese Circulation Society in 2011, the surgical treatment for TA AAD is indicated for the patients with cardiac tamponade, aortic regurgitation (AR), large ascending aorta (>50 mm) and thick thrombosed false lumen (>11 mm) [15]. The initial

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medical managements, which include appropriate control of blood pressure and heart rate, complete bed rest within 48 hours from the onset, and frequent radiographic follow-up, seem to be applied for the hemodynamically stable patients who do not meet above mentioned criteria. However, strict observation of the patients' conditions and repetitive radiographic work-up should be performed, which is likely to be helpful in the early detection of propagation of the aortic dissection. The timely therapeutic conversion from the initial medical management to surgical intervention is very important in the case of recanalization of the false lumen, enlargement of the ascending aorta, and new development of an ulcer-like projection at the ascending aorta or aortic arch. In such cases, either semi-emergent or elective surgery is indicated according to the hemodynamic stability and the period from the onset. There are some advantages in elective aortic operation. The weak dissected aortic wall may stiffen, resulting in easy handling of the graft anastomosis. Moreover, satisfactory postoperative course could be obtained because there are some spare time to evaluate the patients' physical conditions such as brain, heart, liver and kidney. Kitai et al. [3] reported that there were no significant differences of the 30-day mortality rate between the patients with type A IMH treated by medical therapy and those by emergent surgery (4% vs. 6%, respectively).

In conclusion, we should keep in mind that thrombosed type A acute aortic dissection belongs to the "acute aortic syndrome" and is likely to progress to the overt aortic dissection or aortic rupture. The optimal selection of the initial treatment according to the risk stratification can improve the outcomes of this unique disease.

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