Peer Review File

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Review Comment

This is a retrospective study discussing a timeline between onset and surgery. The authors divided the timeline and evaluated the delays in detail. I have some comments and questions.

Comment 1: As the authors repeatedly described, the sample size was too small to make statistical significance in this theme because there might be various settings in aortic dissection. I think more detailed information should be focused in such small sample study.

Reply 1:

First and foremost I would like to thank the editorial board and the reviewer for taking a critical look at this paper.

Even though the data were collected over a period of 10 years, it only concerns 52 patients. Statistical analysis can be performed on these data, but it is clear that the results cannot outweigh a comparable study with almost 900 patients such as the one from the International Registry of Acute Aortic Dissection (IRAD) (2). Nevertheless, we try to learn from our own data, which was the purpose of the analysis. Fairly detailed information on the included cases is provided in Table 1.

Comment 2: For aortic dissection with cerebral malperfusion, the initial imaging studies for stroke as head CT/MRI or cerebral angiography may be the delays of diagnosis. Were there such cases in your study?

Reply 2:

There was 1 patient who presented with cerebral malperfusion and chest pain at the emergency department. This information is provided in Table 1. A head CT was ordered and showed a dissection of the aortic arch with complete occlusion of the right common carotid artery. CT angiography of the thoracic aorta was subsequently performed and led to the certainty diagnosis.

Comment 3: For the patients with shock/tamponade, the initial imaging studies might be bedside TTE, and the dissection flap in the ascending aorta could be detected in some cases of Stanford A dissection, but only one patient was diagnosed by TTE in this study. How many patients were performed bedside TTE before computed tomography?

Reply 3:

Indeed, only 1 patient was diagnosed by transthoracic echocardiography. This patient was known to have dilation of the ascending aorta and no further imaging studies were deemed necessary before transfer to the operating room. In addition, there was 1 other patient who got a bedside transthoracic echocardiography before CT angiography. The bedside TTE could not confirm the diagnosis and was followed by a chest CT which led to the certainty diagnosis.

Patients who presented with shock and / or tamponade (n=11, 8 with shock and tamponade, 2 with shock alone and 1 with tamponade alone, cfr. Table 1) were first given a chest CT in 7 cases. In 2 of these patients this was supplemented with TTE, in 1 patient with TEE. Two patients first received a transoesophageal echocardiography. This led to a certainty diagnosis in 1 patient (without additional

CT) and an additional chest CT was performed in the other patient. One patient was diagnosed by TTE only (which is the patient known with dilation of the ascending aorta described above) and the last patient was diagnosed by coronary angiography.

Comment 4: The authors stated more imaging studies made longer "onset-to-knife" time. However, chest x-ray, ECG, TTE, and CT (four studies) should be performed for patients with chest pain. As you described in Line 223, it is sure that CAG is time-consuming. However, are X-ray and ECG before CT scan really time-consuming for stable aortic dissection?

Reply 4:
Of course, it is often necessary to perform ECG, Chest X-Ray, TTE and CT in order to establish a correct diagnosis. Especially since an acute type A aortic dissection can present itself as another, sometimes life-threatening, condition such as pulmonary embolism, CVA, myocardial infarction, pericardial tamponade, etc. All the imaging studies can indeed be obtained in a short time interval. On the other hand, it is evident that the more examinations are required to arrive at a certainty diagnosis, the more time elapses between presentation and treatment. Ultimately, that is all we confirm without making any statements about the necessity or the order in which the diagnostic tests are to be performed.
Given that a type A aortic dissection has a mortality of 1% per hour, it seems important to us to arrive at a certainty diagnosis in the shortest possible time (and therefore with as few diagnostic tests as possible).

Comment 5: Line 162-164; How about the difference between "onset-to-knife" time at a referring hospital compared to your institution? I think the time should be shorter in the patient who directly transferred to your institution.

Reply 5:

Actually, the median "onset-to-knife" time for patients who were transferred from a referring hospital and the median "onset-to-knife" time for patients who presented at our centre are both 600 minutes. Although the time should be shorter in the patients who presented at our institution directly, this is not shown in our data for which we don't have a clear explanation.

Comment 6: Line 238-239 The authors should comment why female patients take a long "onset-to-knife" time.

Reply 6:

Our data shows a longer onset-to-knife time in women compared to men. This was also reported in the report of the IRAD (7).
We have no unequivocal explanation for this recurring finding. However, it is known that cardiovascular disease in women is more often under-treated, less well studied compared to men and that they have a worse outcome. In addition, they often present with atypical complaints, which means a broader diagnostic landscape and a longer timeframe to find the correct diagnosis.

(31) GARCIA, Mariana, et al. Cardiovascular disease in women: clinical perspectives. Circulation research, 2016, 118.8: 1273-1293.

Comment 7: Line 252-258 The authors stated computed tomography resulted in a tardy “onset-to-knife” time and TTE could save time. Did it mean CT before surgery would be omitted? I consider both CT and TTE are necessary for diagnosis and surgery of AAAD.

Reply 7:

In the answer to Comment 3, you can probably assume that the initial imaging study performed is primarily determined by the physician treating the patient. And it does not follow a pre-established protocol. This is also difficult in a rare condition, such as an acute type A aortic dissection, with a clinical presentation often mimicking other serious conditions.

Which examinations are absolutely necessary before transporting a patient to the operating theatre is up for discussion and depends on the opinion of the treating physician/heart surgeon . In this series of patients, most of them had a chest CT, but sometimes only a TTE or a TEE. Conversely, it may also be that the chest CT was found to be unnecessary or too time consuming in an (un)stable patient.

In our hospital we prefer a chest CT and we believe that a transthoracic echocardiography could be omitted as we perform standard TEE during the cardiac surgery.