

# Splitting at the seams: Extensive Stanford Type A aortic dissection

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## INTRODUCTION

Aortic dissection is a relatively rare condition that causes significant morbidity and mortality. It is most often driven by chronic hypertension, a risk factor seen in 62 - 73% of patients.<sup>(1-2)</sup> However, a variety of other causes including connective tissue disease, vasculitis, trauma, illicit drugs, and previous aortic surgical interventions can also be important risk factors.<sup>(1-2)</sup> Aortic dissection typically arises from a tear between the intima and media / adventitia with potential propagation proximally or distally.<sup>(1-2)</sup> Potential complications that can arise from dissection include "intravascular volume loss, tissue ischaemia, or cardiac tamponade".<sup>(1-2)</sup>

Two classification systems exist for aortic dissection: DeBakey and Stanford; this case will focus on the Stanford classification system.<sup>(1-2)</sup> Stanford Type A involves the ascending aorta, which is treated with emergent surgery, whereas Stanford Type B does not involve the ascending aorta and is medically managed with antihypertensives.<sup>(1-2)</sup>

## CASE DESCRIPTION

A 34-year-old male with history of uncontrolled hypertension and tobacco use presented with acute tearing chest pain and dyspnoea. He was hypertensive and hypoxic upon admission. Work up revealed elevated troponin, D-dimer and BNP. Chest radiograph showed cardiac enlargement and pulmonary oedema. Computed tomography angiography was negative for venous thromboembolism but revealed mild dilation of ascending thoracic aorta measuring 4.0cm x 3.8cm in diameter. Transthoracic echocardiography demonstrated normal systolic

## ABSTRACT

**We present a rare case of extensive Stanford Type A aortic dissection extending from the ascending aorta superiorly to the carotids and inferiorly to the infra-renal abdominal aorta. A 34-year-old male with history of hypertension and tobacco use presents with chest pain, dyspnoea, slurred speech and altered mental status. Chest radiograph showed no mediastinal widening. CT head showed multiple sub-cortical infarcts and CT chest showed mild dilation of the thoracic aorta but no dissection. He subsequently reported bilateral lower extremity numbness and weakness and was intubated for hypoxic respiratory failure. A CT scan of the chest showed extensive Type A aortic dissection. He underwent emergent surgical intervention but due to the extensive dissection and blood loss, he ultimately expired. SAHeart 2019;16:132-134**

function, diastolic dysfunction and moderate aortic regurgitation. He was started on a nitroglycerin drip for the hypertensive emergency and furosemide for the pulmonary oedema. He subsequently developed slurred speech, lower extremity weakness and worsening respiratory failure leading to emergent intubation and vasopressor support. Emergent computed tomographic dissection protocol revealed Stanford A aortic dissection extending from the right carotid artery to the infra-renal abdominal aorta (Figures 1 - 4) and thrombosis of the left renal artery, right carotid artery and infrarenal abdominal aorta. He underwent emergent surgical intervention but ultimately expired. Autopsy revealed diffuse hypertensive changes without evidence of vasculitis confirming death was secondary to complications of dissection.

## DISCUSSION

Extensive Stanford Type A aortic dissection extending proximally to the carotids and distally to the infra-renal abdominal aorta is exceedingly rare, especially in a relatively young and healthy male. Most aortic dissections occur in males with chronic hypertension in the seventh decade.<sup>(2)</sup> Our patient had a history of chronic hypertension and tobacco abuse; however, he was negative for connective tissue disease, vasculitis, trauma, illicit drugs or previous aortic surgical interventions.<sup>(1-2)</sup>

Classic aortic dissection typically presents with a "tearing chest pain that radiates to the back"; however, aortic dissection can

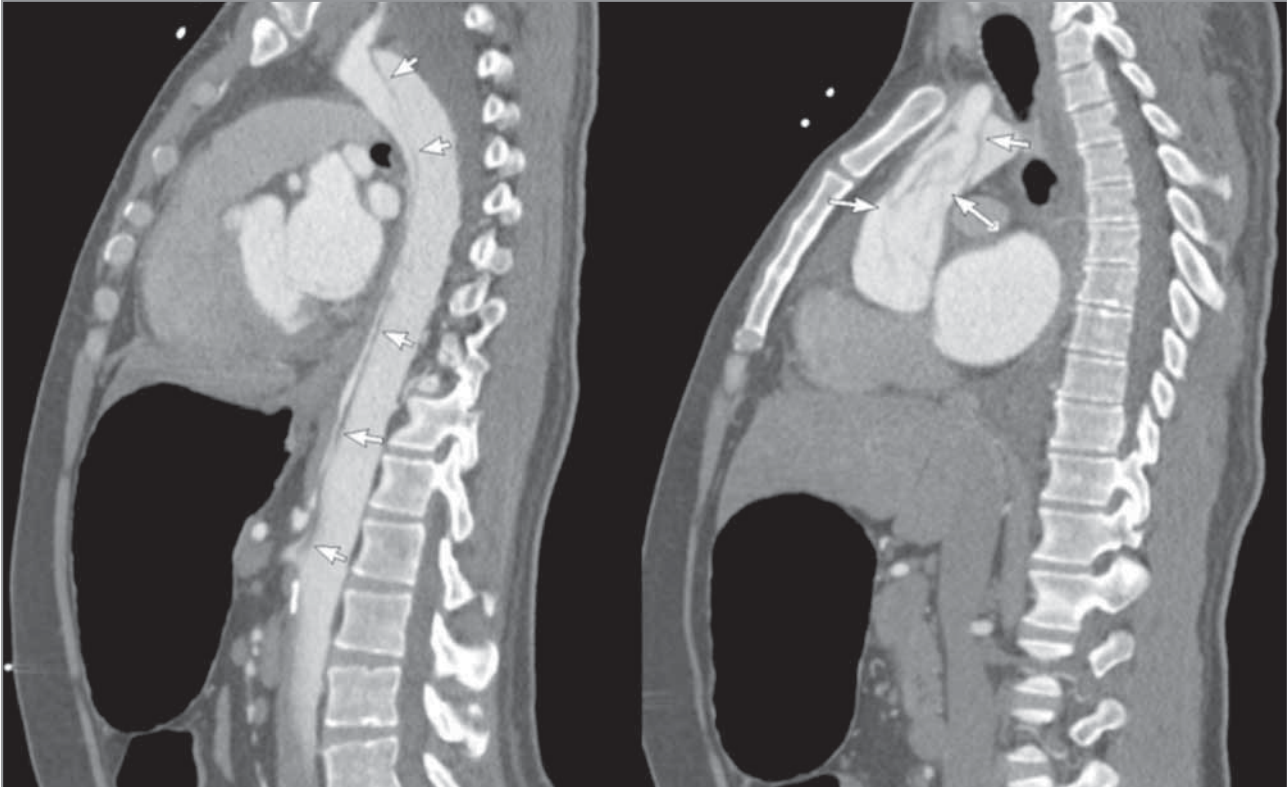


FIGURE 1: Sagittal view showing extensive Type A aortic dissection extending inferiorly to the infrarenal abdominal aorta.

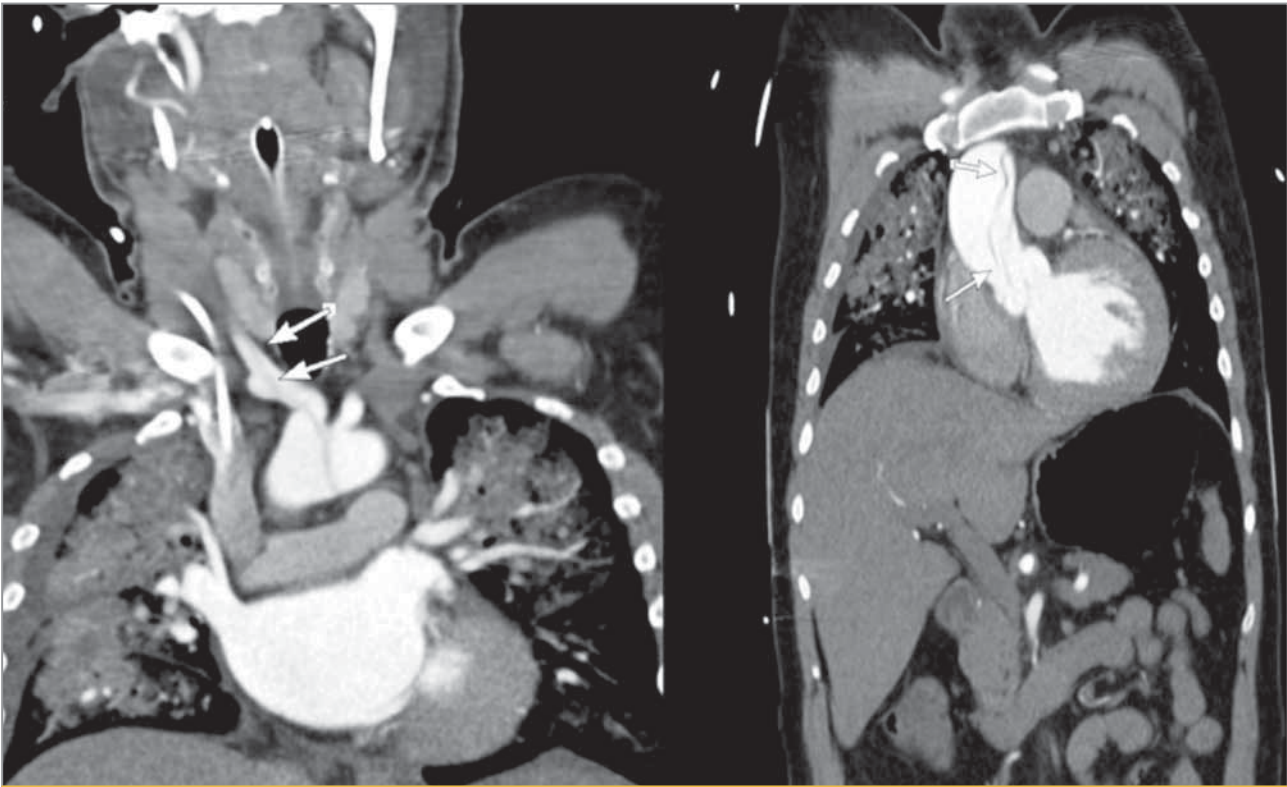
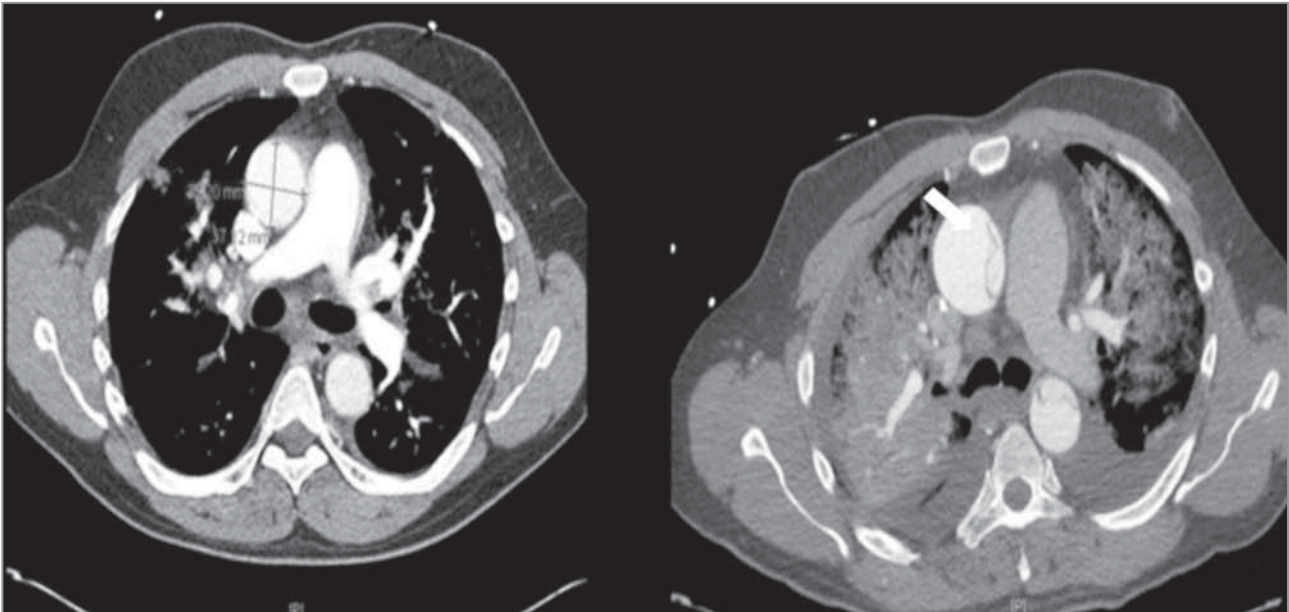
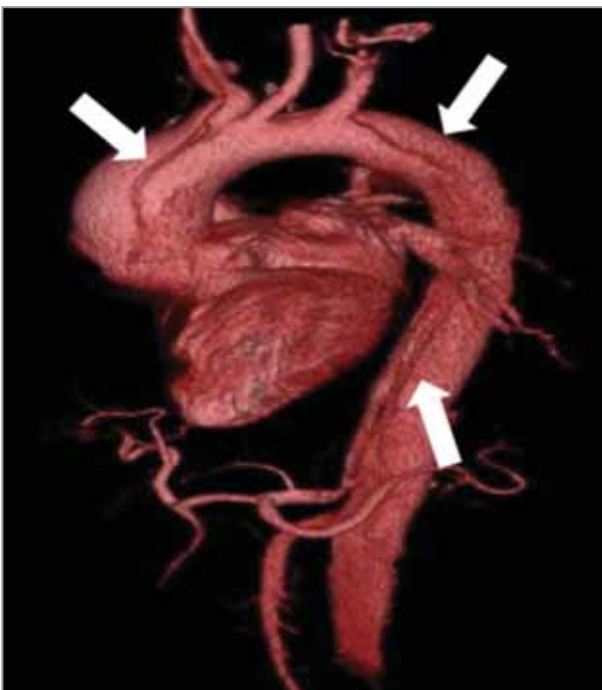


FIGURE 2: Coronal view showing extensive Type A aortic dissection extending superiorly to the right common carotid artery.



**FIGURE 3:** Axial view showing dissection plan of the ascending aorta.



**FIGURE 4:** 3D reconstruction showing the extensive Type A aortic dissection arising from the ascending aorta and extending superiorly to the right common carotid and inferiorly towards the infrarenal abdominal aorta.

be incredibly easy to miss.<sup>(2)</sup> Our patient initially presented with acute chest pain and dyspnoea. Initial chest radiograph was not suggestive of mediastinal widening, and CT imaging of the chest showed ascending thoracic aorta dilation without dissection. It was not until findings of stroke-like symptoms of slurred speech,

lower extremity weakness, and respiratory failure prompted a second CT chest, abdomen, and pelvis that an extensive dissection showed. The patient's age, atypical presentation, and initial imaging showing dilation but not dissection led to a delay in diagnosis and subsequent treatment. Type A dissections have a mortality rate of 2% per hour which necessitates immediate repair.<sup>(1)</sup>

In addition to demonstrating the importance of recognising aortic dissection, this case also demonstrates the importance of the new 2017 ACC/AHA Hypertension Guidelines.<sup>(3)</sup> Our patient was classified as pre-hypertensive and was not treated on antihypertensive medications. However, the new guidelines would place the patient in Stage I hypertension which would have prompted treatment.<sup>(3)</sup> This patient demonstrates the importance of controlling hypertension in healthy patients.

**Conflict of interest:** none declared.

## REFERENCES

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