

# An Overview of Aortic Dissection

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## Introduction

Aortic dissection (AD) happens when the innermost layer of the aorta is injured, allowing blood to flow between the layers of the aortic wall, causing them to separate. This is usually accompanied by a sudden onset of intense chest or back pain, which is commonly described as "tearing" in nature. Vomiting, sweating, and light headedness are also possible side effects. Other symptoms, such as stroke, lower extremity ischemia, or mesenteric ischemia, may be caused by a decrease in blood supply to other organs. Aortic dissection can soon result in mortality due to a lack of blood flow to the heart or full aortic rupture [1].

## Description

### What is aortic dissection?

High blood pressure, a number of connective tissue diseases that impact blood vessel wall strength, such as Marfan syndrome and Ehlers Danlos Syndrome, a bicuspid aortic valve, and previous heart surgery are all risk factors for Alzheimer's disease. An elevated risk is also linked to major trauma, smoking, cocaine use, pregnancy, a thoracic aortic aneurysm, artery inflammation, and abnormal cholesterol levels. Medical imaging, such as computed tomography, magnetic resonance imaging, or ultrasound, is utilised to confirm and further analyse the dissection based on symptoms. Stanford type A, which involves the initial half of the aorta, and Stanford type B, which does not, are the two basic types. Controlling blood pressure and quitting smoking are two methods of prevention. The treatment of aortic stenosis is dependent on whatever portion of the aorta is affected. Aortic dissections involving the initial half of the aorta (near the heart) frequently necessitate surgery. Surgery can be performed through a chest opening or from within a blood artery. Aortic dissections involving the second half of the aorta are normally treated with blood pressure and heart rate lowering medicines, until problems arise that necessitate surgical intervention [2].

Alzheimer's disease is a relatively uncommon disease, with an annual incidence rate of three per 100,000 persons. It affects more men than women. The average age of diagnosis is 63 years old, with roughly 10% of cases occurring before the age of 40 yr. Without treatment, half of patients with Stanford type A dissections die in three days, while 10% of those with Stanford type B dissections die in a month. The first case of AD was documented in King George II of Great Britain's autopsy after his death in 1760. Michael E. DeBakey pioneered surgery for Alzheimer's disease in the 1950s [3].

### Signs and symptoms

Approximately 96 percent of people with Alzheimer's disease experience

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significant pain that comes on suddenly. The pain in the chest, back, or abdomen can be described as tearing, stabbing, or acute. As the dissection progresses down the aorta, about 17% of people experience pain that migrates. The position of the dissection is linked to the area of the pain. Anterior chest discomfort is linked to ascending aortic dissections, whereas interscapular back pain is linked to descending aortic dissections. If the pain is pleuritic, it could be an indication of acute pericarditis, which is caused by bleeding into the sac that surrounds the heart. This is a particularly perilous scenario, as it indicates that acute pericardial tamponade is likely. The most common cause of death from Alzheimer's disease is pericardial tamponade [4].

While the pain may be mistaken for that of a heart attack, AD is rarely linked with other symptoms like heart failure or changes in the ECG. Congestive heart failure (7 percent), fainting (9 percent), stroke (6 percent), ischemic peripheral neuropathy, paraplegia, and cardiac arrest are some of the less common symptoms associated with Alzheimer's disease. Approximately half of the time, fainting is caused by bleeding into the pericardium, resulting in pericardial tamponade. The involvement of one or more arteries supplying sections of the central nervous system causes neurological problems such as stroke and paralysis.

**Blood pressure:** High blood pressure is common in people with Alzheimer's disease. When someone has acute Alzheimer's disease, their blood pressure is highly fluctuating. It is more common in people who have had a distal dissection. Thirty-six percent of people with proximal AD have hypertension, whereas twenty-five percent have hypotension. Cystic medial degeneration is linked to proximal AD, which causes the arterial wall to deteriorate. Sixty-seven percent of those with distal (Stanford type B) AD have high blood pressure, while two to three percent have low blood pressure [5].

**Aortic insufficiency:** Aortic insufficiency (AI) affects half to two-thirds of ascending AD patients and aortic insufficiency's diastolic heart murmur can be heard in roughly 32% of proximal dissections. The strength (loudness) of the murmur is determined by blood pressure, and it may be inaudible if blood pressure is too low.

In the context of escalating AD, AI might have a variety of causes. The dissection may enlarge the aortic valve's annulus, preventing the valve's leaflets from coapting. The aortic valve leaflets may be detached if the dissection extends into the aortic root. Alternatively, the intimal flap may collapse into the left ventricular outflow tract after a substantial intimal tear, inducing intimal intussusception into the aortic valve and impeding proper valve closure [6].

**Myocardial infarction:** In 1–2% of aortic dissections, a heart attack ensues. The involvement of the coronary arteries, which feed the heart with oxygenated blood, in the dissection, causes infarction. Right coronary artery involvement is more common than left coronary artery involvement. If thrombolytic therapy is used to treat a myocardial infarction, the mortality rate rises to almost 70%, owing to bleeding into the pericardial sac, which causes cardiac tamponade.

### Causes

Hypertension (high blood pressure) and a variety of connective tissue illnesses are linked to aortic dissection. Aortic dissection is rarely accompanied by vascular inflammation (inflammation of an artery). It could also be caused by a chest injury. A past history of hypertension is found in 72 to 80 percent of people who have an aortic dissection. Illicit substance use, such as cocaine and methamphetamine, is also a modifiable risk factor for Alzheimer's disease. 7–14 percent of those with an aortic dissection have a bicuspid aortic valve (a kind of congenital cardiac disease involving the aortic valve). The ascending aorta of these people is prone to dissection. The degree of stenosis of the

valve has no bearing on the risk of dissection in those with bicuspid aortic valves.

Aortic dissection is more likely in those with connective tissue disorders like Marfan syndrome, Ehlers–Danlos syndrome, and Loeys–Dietz syndrome. Aortic dissection has also been linked to vasculitides such as Takayasu's arteritis, giant cell arteritis, polyarteritis nodosa, and Behçet's disease. Marfan syndrome affects 5–9% of people who have undergone an aortic dissection. The incidence of this subcategory is higher among young people. Individuals with Marfan syndrome are more likely to have aortic aneurysms and proximal aortic dissections.

Aortic dissection can occur as a late complication of cardiac surgery. A history of open-heart surgery is present in about 18% of people who suffer an acute aortic dissection. Because aortic regurgitation generates increased blood flow in the ascending aorta, people who have had an aortic valve replacement for aortic insufficiency are at a higher risk. The walls of the ascending aorta can dilate and weaken as a result of this [7].

## Diagnosis

The diagnosis of aortic dissection might be difficult due to the wide range of symptoms. Those with low blood pressure, neurological disorders, or uneven pulses should be especially concerned. While a solid history from the patient may strongly imply an aortic dissection, the diagnosis cannot always be determined only on the basis of history and physical findings. Visualization of the intimal flap on a diagnostic imaging test is frequently used to make the diagnosis.

A CT scan of the chest with iodinated contrast material and a transesophageal echocardiography are two common tests used to identify an aortic dissection. Because the aorta is so close to the oesophagus, higher-frequency ultrasonography can be used to provide clearer anatomical images. Aortograms and magnetic resonance angiograms of the aorta are two other diagnostics that may be used. Each of these tests has advantages and disadvantages, and their sensitivity and specificity in diagnosing aortic dissection are not equivalent [8].

## Conclusion

Hypertension, unusually high levels of lipids (such as cholesterol) in the blood, and smoking tobacco use are all considered preventable risk factors for aortic dissection. When the ascending aorta enlargement is higher than 5.5 cm (2.2 in) in diameter, repair of an aneurysm or previously undetected and untreated aortic dissection is advised to reduce the risk of dissection. If the aorta is larger than 4.5 cm (1.8 in), repair may be advised if the person has one of many connective-tissue illnesses or a family history of aorta rupture.

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