

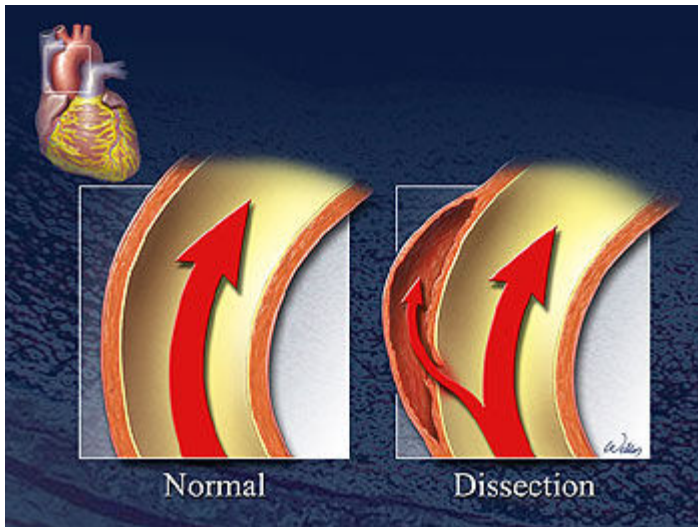
## **Acute Aortic Dissection: An Uncommon but Serious Cardiovascular Condition**

### **What is an aortic dissection?**

The aorta is the main artery in humans, delivering blood from the heart to the entire body. The wall of the aorta is comprised of three layers which are normally in close contact. A dissection occurs when the inner layer of the aortic wall tears, leaving the outer layer intact. This causes blood to flow between these layers, forcing their separation, or “dissection.” Even though the original tear may be small, the dissected area can spread along the whole aorta, and even along other arteries.

Two classification systems exist for describing aortic dissections, the Stanford System and the DeBakey System. Both classify dissections based on the location of the initial tear. Under the Stanford System, **Type A dissections** arise from a tear in the ascending aorta, located just above the heart. These are also known as “ascending” aortic dissections, and are usually treated with emergency surgery. **Type B dissections** arise from a tear in the descending aorta, which extends through the abdomen towards the legs. Although still very serious, these are often first treated with medical management.

Some experts prefer to use the DeBakey System to classify Aortic Dissections. Under this system, **Type I dissections** are those that originate from a tear in the ascending aorta and spread to other areas. **Type II dissections** are those that originate in the ascending aorta and remained confined there. **Type III dissections** are any dissections that originate in the descending aorta.



### **How is this related to an aortic *aneurysm*?**

An aortic aneurysm is an enlargement of the aorta which leads to thinning of the aortic wall. An aneurysm develops over many years, as blood pressure gradually stretches a section of the aortic wall to more than its usual width. However, the inner and outer layers stay intact, so this is usually painless. Since there are typically no noticeable symptoms, many people with aortic aneurysms don't even know they have them.

Aortic aneurysms are very dangerous, however, since the stretched section can burst. If the entire wall tears, this is called a ruptured aneurysm. If only the inner layer of the wall tears, blood fills the space between, leading to an aortic dissection. Both situations are life-threatening.

### **Why is an aortic dissection dangerous?**

Aortic dissections can cause several problems. The area between the inner and outer aortic layers fills with blood, diverting blood flow from the circulatory system. This blood exerts pressure on the outer layer, increasing the risk that the entire aorta will burst and cause massive internal bleeding. Other complications can arise due to the reduced

blood flow to many of the body's arteries. This can be especially dangerous if the arteries that supply vital organs such as the brain, kidneys, or the heart are affected. If these organs don't receive adequate blood flow, this may result in a stroke, kidney failure, or a heart attack, depending on which arteries are involved.

### **What are the symptoms of an aortic dissection?**

The symptoms of an aortic dissection are similar to those of a heart attack, making it a difficult condition to diagnose. The most common symptom is chest, back, and/or abdominal pain, which may or may not spread. Occasionally, a patient may experience more unusual symptoms such as fainting, lightheadedness, or shortness of breath.

Since heart attacks and aortic dissections require very different treatment, it is important to be able to distinguish the two. Dissections usually cause pain that is more sudden and may be more intense than that of a heart attack, often accompanied by a ripping or tearing sensation. Many patients have described it as the worst pain they have ever felt. However, not all aortic dissections fit this description, and some patients only experience mild pain or none at all. Therefore it is always important to consider this condition as a possibility if any of the above symptoms arise. Due to the severity of this condition, and its tendency to go unrecognized, it claims the lives of thousands of Americans each year.

### **What are the risk factors for aortic dissection?**

**Hypertension** (high blood pressure) is the single most important risk factor for an aortic dissection. Over time, this extra pressure in the aorta can weaken and stretch the aortic walls, increasing the risk for a dissection.

Aortic dissections are known to be hereditary. Individuals with a close relative who has suffered an aortic dissection are also at risk themselves. **Marfan's Syndrome, Turner's**

**Syndrome**, and **Ehlers-Danlos Syndrome** are genetic diseases which are associated with abnormal aortic tissue, and which have been linked to aortic dissections.

Also susceptible are individuals with abnormal aortic valves comprised of two leaflets instead of three (**bicuspid aortic valve**). Patients with **aortic aneurysms** are also at risk, since the stretched aortic segment may tear.

Additional risk factors include:

- Male gender
- Greater than 40 years old
- Atherosclerosis
- Prior cardiac surgery
- Cocaine, amphetamine, or stimulant abuse.
- Smoking

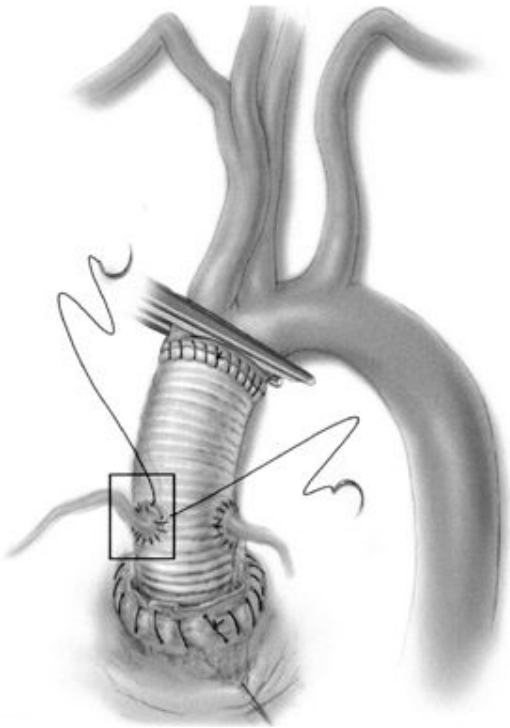
### **How is an aortic dissection treated?**

Aortic dissections are dangerous and require immediate medical attention. If one is suspected, the patient typically undergoes either a chest CT scan or a [Transesophageal Echocardiogram](#) (TEE) to establish the diagnosis. However, sometimes a dissection is not suspected, and these tests are never ordered. Therefore, if an individual has any risk factors for aortic dissection, it is important for him/her to tell their physician immediately upon reaching the hospital.

Type A dissections usually require surgery in order to repair or replace the dissected aortic segment. During the procedure, the patient's heart and lungs are bypassed with a heart-lung machine, to allow access to the aorta. The torn section of the aorta is then replaced with a tube graft made of Dacron, a synthetic material that mimics the aortic wall. The coronary arteries are re-attached to the new aorta, and often the heart's aortic valve is repaired or replaced. Next, a combination of felt and BioGlue is implanted

between the dissected inner and outer aortic layers. This helps to eliminate the gap between the two layers, and provides extra structural support for the aorta.

The typical in-hospital recovery time after surgery is about a week. After surgery, patients are usually able to work, exercise moderately, and lead normal lives, as long as they control their blood pressure.



Type B dissections are first treated through medication and lifestyle changes with a goal of reducing blood pressure. Sometimes surgery, and more recently, stent grafts may be utilized.

### **What do I do next after suffering a dissection?**

After a dissection, patients must identify the underlying causes and treat them. Usually this includes taking aggressive steps to reduce blood pressure through medications and

diet and lifestyle changes. Patients can exercise with their cardiologist's approval, but strenuous activities such as weight lifting should be avoided.

It is also important to explore the possibility that genetic traits may have led to the dissection. If genetic traits were a cause of the dissection, this knowledge can help protect family members from the same disease. Typically, close family members should be screened for genetic risk factors and pre-existing aortic aneurysms. This includes parents, brothers, sisters, and children.

Patients should also engage in close follow-up visits with a cardiologist. Having surgery or receiving a good blood pressure medication is not enough to treat an aortic dissection in the long-term. Aortic complications could occur and therefore close follow-up and imaging tests are needed.

Currently, patients are recommended to have follow-up visits every three months for the first year after the dissection. Usually patients will also require once-yearly follow-ups beyond this. Follow-up testing often involves MRI, CT, or echocardiogram imaging.