Aortic Dissection with Different Imaging Modalities

Introduction

Aortic Dissection is a condition that takes place in the inner layer of the aorta. In this condition, the aorta begins to tear causing blood to rush through the opening causing the inner and middle layers of the aorta to separate.[1]

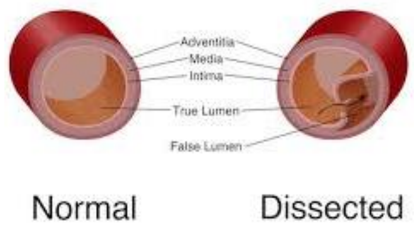

Figure 1 Normal Aorta vs. Dissected Aorta

Signs and Symptoms

When the dissection initially occurs, the layers of the aorta are being forced apart, which is when the symptoms occur and normally appear as a very severe, sharp pain in the chest and back.[2] Shortness of breath, syncope, hypotension, and abdomen pain all go along with an aortic dissection. [1]

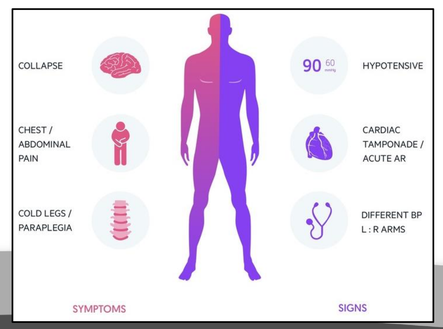

Figure 2: Signs and Symptoms

Types of Dissections

There are two types of an aortic dissection separated into Type A and Type B. Type A occurs in the ascending aorta while Type B occurs in the descending aorta. While both types are serious conditions, Type A is far more common and dangerous due to it being more likely to cause the aorta to rupture and be fatal. Type B is not as common as Type A but does cause reduced or a blockage of blood flow to organs, then again can be treated with medications and monitoring. [4]

Type A and B are further identified into classifications of being acute or chronic. In most of aortic dissections, they are classified as acute. An aortic dissection being classified as acute means the tear causes the symptoms to display almost immediately and can be fatal. On the other hand having an aortic dissection to be classified as chronic means that the symptoms of the tear may go unnoticed while causing additional complications. This type of dissection is Type B. [4]

Imaging Modalities

Aortic Dissection can be confirmed with many different modalities such as X-ray, Echocardiography, Computed Tomography, or MRI. [3] The first is x-ray, which demonstrates a widened mediastinum and left-sided pleural effusion. Next is echocardiography, which uses ultrasound to show how the muscles and valves in the heart are functioning. CT is the most common and accurate modality in finding an aortic dissection because of its short acquisition time and data reconstruction, broad availability, and shows cross-sectional images of the heart.[3] MRI shows high resolution images of the aorta and aortic wall but has a long acquisition time. [5]

Figure 3: CXR with Aortic dissection

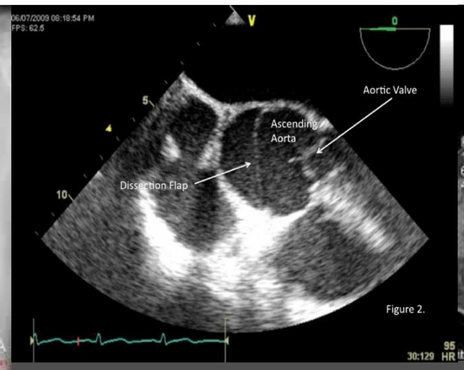

Figure 4: Echocardiography with Aortic dissection

Figure 5: CT with Aortic dissection

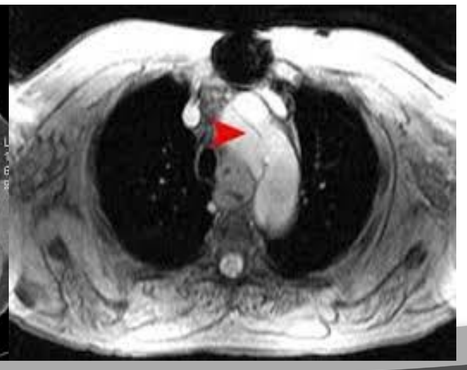

Figure 6: MRI with Aortic dissection

Treatment

Treatment for an aortic dissection may involve different medications or surgery depending on the type/area affected. Treatment for Type A consists of surgery intended for the removal of the dissection in order to block the entry of the blood and introduce a graft to be placed to reconstruct the aortic wall. Medications chosen will help reduce heart rate and lower blood pressure. [1]

Treatment for Type B is similar to Type A except in surgery a stent might be inserted into the aorta for support. [1]

Conclusion

Aortic dissection is a very serious condition that can be diagnosed with many different modalities, but CT is the fastest and widely available imaging modality. After the diagnosis, the treatment would be either surgery or medications depending on the type.

References:

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5. Wilbers, BA, C. R., Carrol, MD, C. L., & Hnilica, BA, M. A. (1990). Optimal Diagnostic Imaging of Aortic Dissection. *Texas Heart Institute Journal*.