Aortic Dissection

Red Flags for the Emergency Triage Nurse

Published by the National Marfan Foundation
AORTIC DISSECTION: RED FLAGS FOR THE EMERGENCY TRIAGE NURSE

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A 38-year-old man comes to the ED two hours after eating in a restaurant with his wife. He is complaining of severe abdominal pain, nausea and has just had a loose bowel movement. He had a couple of cocktails at dinner. He has a history of HTN but can’t remember the name of his medication. On further questioning, he states that the pain started in his chest but now has moved to his mid abdomen. His blood pressure is 160/110, his heart rate is 90, and his respiratory rate is 18. His abdomen is tender on deep palpation.
Marfan Syndrome and Aortic Dissection

As the first point of contact in most emergency departments, the triage nurse plays a vital role in assuring that patients receive proper care. Recognizing potentially life-threatening conditions and moving patients along in the treatment process is imperative to preventing adverse outcomes.

An aortic dissection is a tear in the inner layer of the aortic wall. This tear allows blood to enter and separate the inner and outer layers of the vessel. In addition, dissection can weaken
the outer wall, resulting in formation of an aneurysm or rupture; occlusion (blockage) of aortic branch vessels causing myocardial infarction, stroke, kidney failure, bowel ischemia, paraplegia or limb ischemia; and disruption of the aortic valve, resulting in valvular insufficiency and congestive heart failure.

Approximately 10,000 people experience aortic dissections annually, so it is likely the triage nurse will encounter this condition in the ED.

Aortic dissection, sometimes referred to as “the great imitator,” can look like many other more benign ailments. As a result, it is extremely important that the triage nurse be prepared to recognize the signs of aortic dissection, including some that are less common, and consider the bigger picture. The “red flags” presented here are possible observations of which the triage nurse should take note and carefully consider when assessing a patient.
What is Marfan syndrome?

People with Marfan syndrome are at up to 250 times greater risk of aortic dissection than the general population, and are at increased risk of rapid deterioration and poor outcome.

Marfan syndrome is a genetic disorder of connective tissue. Marfan syndrome and related connective tissue disorders affect approximately 200,000 people in the United States, and are seen equally in men and women of all races and ethnic groups. Connective tissue is the glue and the scaffolding of the body. All organs contain connective tissue, and the manifestations of Marfan syndrome appear in many parts of the body, including the skeletal, ocular, cardiovascular, pulmonary and nervous systems. In patients with Marfan syndrome, aortic dissection is the most serious complication and a frequently missed diagnosis.

Aortic dissection should be immediately ruled out in a Marfan patient complaining of chest, back or abdominal pain.
Clinical features of aortic dissection are not unique to those with Marfan syndrome. A nurse must be knowledgeable about the range of symptoms associated with aortic dissection regardless of the underlying cause.

Men in the general population are 4–5 times more likely to be affected by aortic aneurysm than women; however, both men and women with Marfan syndrome or another predisposing risk factor are at proportionately higher risk than the general population. Do not discount aortic aneurysm or dissection based solely on gender.

“Even if we had not known that our patient had been diagnosed with Marfan syndrome, we noted his “marfanoid” appearance—tall, lanky frame, pectus excavatum, large hands and feet, and ectopia lentis. These characteristics are pathognomonic for the condition.” (JENA, Feb 2005, 31:1, p. 27.)

Even if a person has never been told s/he has Marfan syndrome, physical characteristics of the disorder should be considered significant and the possibility of aortic dissection should be strongly considered.
AORTIC DISSECTION
CASE STUDY #2

A 35-year-old woman with a history of asthma has had increasingly severe pain in her chest and precordial area radiating into her back for the past seven hours which started while she was vacuuming. It hurts more when she takes a deep breath. She has a history of asthma. Her BP is 110/70, her heart rate is 100, her respiratory rate is 20, and her oxygen saturation is 94%. She has mild expiratory wheezing. Her initial EKG is normal.
Triage and Assessment

During triage and assessment, a number of clinical signs—“red flags” as noted on the following pages—should alert the nurse to the possibility of aortic dissection. The ability to recognize these signs may make the difference between securing immediate life-saving interventions and waiting until it is too late for the patient.

Many people with Marfan syndrome have never been diagnosed with the disorder. Therefore, do not necessarily rely on a patient to confirm your suspicions regarding a marfanoid appearance.
Initial Observation:

The initial observation of the patient may reveal physical features characteristic of Marfan syndrome. These include:

- tall stature
- disproportionately long arms, legs, fingers and/or toes
- pectus excavatum (sunken chest) or pectus carinatum (pigeon breast)
- scoliosis or kyphosis
- flat or inwardly rotated feet, hammer toes
- joint hypermobility
- facial features such as long, narrow face, underdeveloped cheekbones, deep set eyes, receding lower jaw, down-slanting eyes
- high arched palate and crowding of the teeth
- dislocated lens of the eye
- unexplained striae
A 70-year-old woman developed pain suddenly in her mid and then lower back while doing aquatic exercises in a swimming pool during an exercise class for senior citizens at the local Y. The pain is 9/10 and is in her lower back with radiation to her legs. She has a history of diabetes, HTN and angina. Her blood pressure is 150/95, her heart rate is 60, and her respiratory rate is 15.
Chief Complaint:

Symptoms of aortic dissection are extremely variable, but are often described by patients as:
- sudden onset severe pain along midline in chest, back or abdominal region
- penetrating pain front to back
  - ripping, burning or tearing sensation
  - migratory
- pain like they have never experienced before or sense of impending doom

A patient with an aortic dissection may not appear to be “typical” chest pain patient—s/he may be younger, tall/thin, and have no known risk factors for heart disease.
Vital Signs:

A patient experiencing aortic dissection may have normal vital signs, or have:

- tachycardia
- elevated BP
  - may indicate predisposing factor to AD
  - pain from the dissection may cause increase in BP
  - partially or completely blocked artery to one or both kidneys may cause increase in BP
- low BP
- abnormally large difference between systolic and diastolic BP
- asymmetrical pulse as noted in both wrists, both legs, and/or both sides of neck over carotid arteries
- asymmetry of blood pressure (measurement taken in both arms)
- heart murmur
A 48-year-old male had sudden onset of severe chest pain 8/10, radiating between his shoulder blades, which started after he swung a golf club. He couldn't continue the game and went home to see if it would go away. Pain has continued and now is also in his abdomen. Prior to coming to the ED, he had two episodes of bloody diarrhea. He has no significant medical history. Blood pressure is 160/90, heart rate is 78, and respiratory rate of 16. Initial EKG is normal.
Signs and Symptoms:

Additional findings that suggest aortic dissection include:

- pain, pallor, pulselessness, parathesia and paralysis (the 5 P's)
- weakness in one or both legs or arms
- fever
- radiation of pain to back or stomach
- bloody diarrhea or coughing up blood
- stroke-like symptoms due to occlusion of carotid artery
- neurologic signs, similar to those of a transient ischemic attack or stroke
- hoarseness or a sensation of having a lump in the throat
- wheezing, dispnea or cough

Aortic dissection is frequently referred to as “the great imitator” because of its tendency to look like other, more benign medical problems.
Medical History:

When taking medical history, the following should raise suspicion of aortic dissection:

- diagnosis of Marfan syndrome in patient or family member
- family history of aortic dissection or unexplained sudden cardiac death, especially under the age of 50
- past ascending aorta repair
- known aortic aneurysm
- history of other conditions predisposing to aortic dissection (Ehlers-Danlos, type IV, familial aortic aneurysm, Turner syndrome, bi-cuspid aortic valve, Loeys-Dietz syndrome)
- history of pectus repair or scoliosis treatment
- history of hypertension or of mitral valve prolapse or “heart murmur”
- history of spontaneous pneumothorax, early onset emphysema or other lung problems
- dislocated lenses
A 34-year-old male arrived in the ED complaining of sudden onset chest pain associated with headache and one episode of vomiting. Upon questioning, he reports a family history of Marfan syndrome. He had slightly slurred speech and was diaphoretic at triage. His BP was 90/60 and HR 110.
Nursing Assessment:

The nurse may also observe:

- physical characteristics of Marfan syndrome
- patient in distress or obvious pain
- sense of doom or that something is terribly wrong
- pain like s/he has never felt before
- altered mental status

Keep in mind that a normal EKG or chest radiograph does not rule in or out the possibility of an aortic dissection.

If aortic dissection is even remotely suspected, studies should be performed and read as soon as possible—waiting could be the difference between life and death.
In summary, symptoms of aortic dissection can be variable, relatively minor and nonspecific. Chest pain is the most common symptom, but pain can also occur in the back and/or abdomen. The pain may be described as severe or vague, constant or intermittent, migratory, tearing, tightness or fullness. Other signs and symptoms can include cardiovascular instability, pulselessness, parathesia, paralysis, syncope or a sense that “something is terribly wrong.”

If a person indicates that he or she has Marfan syndrome, or if physical characteristics lead to suspicion of the possibility that s/he may be affected and not know it, aortic dissection should be ruled out immediately.
The most definitive tests for aortic dissection are CT scan, TEE or MRI. The one that is most readily available, expertly performed and expertly interpreted should be chosen. It is important to understand that a normal chest x-ray does not rule out aortic dissection.

50% of patients with undiagnosed aortic dissection die within 48 hours, a death rate of approximately 1% per hour.

Dissections of the aortic root and ascending aorta require immediate surgical intervention. Descending and abdominal dissections may be stabilized and medically managed.

Once the patient has been stabilized and treated, it may be appropriate to address the possibility of the need for evaluation of other members of the family for signs of the underlying cause of the aortic dissection. Many families do not realize that they have Marfan syndrome or other genetic conditions which can cause aortic aneurysm. The National Marfan Foundation can help with the process of seeking a diagnosis.
In January of 1996, Jonathan Larson, creator of the hit musical *RENT*, died suddenly of a ruptured aortic aneurysm which was missed in TWO hospital emergency departments. It is thought that his condition was probably caused by Marfan syndrome. He did not know he had the disorder.

Since then, the Larson family has worked closely with the National Marfan Foundation to raise awareness of aortic dissection and Marfan syndrome.

**Acute Aortic Dissection**

When diagnosed:  
**Over 85% surgical success rate.**

If undiagnosed:  
**50% dead in 48 hours.**

Don’t be the one to miss it.
Special Thanks to:

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Alan & Nan Larson

Note: Each person pictured in this booklet has a connective tissue disorder placing him or her at increased risk of aortic dissection.

Photo Credits: Rick Guidotti, Positive Exposure
www.positiveexposure.com
“By knowing the risk factors for aortic aneurysm and zeroing in on the signs and symptoms, you can help a patient manage the problem before it becomes an emergency. And if an aortic aneurysm becomes an emergency, knowing the appropriate responses can help save your patient’s life.”

Irwin, G.H., RN, CEN, BSN.
“How to Protect a Patient with Aortic Aneurysm.”