Anxiety Disorders: Aortic Aneurysm in the Differential?

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By Gagan Deep Mall, MD [6], Radwane Kesserwane, MD [7], Thomas A. Hennebry, MD [8], and Ashley B. Benjamin, MD [9]

Worsening anxiety is a common symptom that may result in psychiatric consultation or evaluation in an emergency setting. Aneurysms are rarely considered in the medical differential for anxiety disorders, and the available literature and research regarding this possible connection are very limited. Overlooking this diagnosis, however, can have disastrous consequences. Here we present 2 case reports as well as a review of the literature regarding a possible relationship between aortic and thoracic aneurysms and psychiatric symptoms.

Anxiety disorders, including panic attacks, may have multiple cardiovascular causes, such as congestive heart failure, arrhythmias, angina, and mitral valve prolapse.1 A literature search of several databases (PsycINFO, PubMed, Medline, Biomedical Reference Collection, and Psychology & Behavioral Science Collection) revealed only 1 report of panic attack symptoms possibly related to an enlarging thoracic aortic aneurysm (TAA).2 However, possible connections have been noted between aneurysmal dissection and both weight lifting3 and extreme emotional states.4 These initial and varied findings further support a possible connection between emotional symptomatology and aortic aneurysms.

In an attempt to further expound on this minimally researched topic, we present 2 cases in which anxiety symptoms may be associated with an aortic aneurysm. We also briefly review aortic aneurysms.

**CASE 1**
This patient is a 51-year-old man with a long history of posttraumatic stress disorder (PTSD), alcohol dependence (in full sustained remission), hypertension, gastroesophageal reflux disease, atypical chest pain, hepatitis C, bladder cancer (in remission), and chronic back pain related to degenerative joint disease.
He presented with worsening anxiety and panic symptoms a few months before his TAA diagnosis. Worsening symptoms included sleep-onset insomnia, worrying, difficulties with concentrating, tremors, tingling in his fingers, and palpitations. He denies any recent psychosocial stressors or medication changes to account for these symptoms. He has been taking alprazolam, 1 mg tid, for the past 15 years. In addition, he has been taking citalopram, 60 mg at bedtime; doxepin, 50 mg at bedtime; and hydrocodone-APAP, as needed for pain.
A routine chest radiograph taken 2 years earlier, and a follow-up CT scan, confirmed the dilatation of the ascending fusiform aorta, which measured 5 cm in diameter. Cardiac catheterization also showed a moderately severe dilatation of the ascending thoracic aorta. Surgical resection ensued; the patient remains stable.

**CASE 2**
This patient is a 54-year-old man with a history of PTSD, schizophrenia (residual), hypertension, dyslipidemia, obesity, chronic renal failure, and coronary artery disease that required a 5-vessel coronary artery bypass graft 10 years earlier and coronary stent placement 4 years earlier. He also has a 20-year history of chronic low back and lower extremity numbness and pain as a result of a work-related injury.
He was stable on a regimen of diazepam, 5 mg bid, until 4 years ago, when he noted worsening of his nightmares, anxiety, and panic symptoms; these worsening symptoms resulted in the doubling of his diazepam dose. His new-onset panic symptoms included tremors, chest pain, sweats, shortness of breath, dizziness, choking sensations, and feelings of impending doom and were not consistent with his typical PTSD-related anxiety. His schizophrenia remained in full remission.
At the time of his aneurysm diagnosis, his medication regimen included diazepam, 10 mg bid; thiothixene, 20 mg at bedtime; and benztrapine, 2 mg once daily. His nonpsychotropic medications included allopurinol, 200 mg once daily; aspirin, 325 mg once daily; felodipine extended-release, 10 mg in the morning and 5 mg in evening; hydrochlorothiazide, 25 mg in the morning; lisinopril, 40 mg in the morning; methocarbamol, 500 mg bid; naproxen, 500 mg bid; nitroglycerin sublingual, 0.4 mg...
as needed; and simvastatin, 20 mg once daily. There were no changes in his medication regimen that would account for his increased anxiety symptoms. Based on the patient’s complaints of increased back and shoulder pain, a CT scan was ordered; it showed a TAA of 3 cm in diameter. The most recent CT scan showed slight expansion of the aneurysm to 3.3 cm.

**DISCUSSION**

Later onset or worsening of anxiety symptoms is often a sign of a concomitant or worsening medical condition. Disorders such as chronic obstructive pulmonary disease or thyroid dysfunction are commonly considered in the differential diagnosis of anxiety disorders, but aneurysms are not. In the cases presented, both patients have numerous medical conditions that can result in anxiety symptoms. Both patients also have risk factors for an aortic aneurysm, but this diagnosis was not considered during either patient’s initial presentation for worsening symptoms. This is especially critical when situational, laboratory, and medication or illicit substance effects have been ruled out as a cause of worsening anxiety, as was the case in both patients. Currently, there are no data to support a causal effect. In the cases presented here, there was no documentation of a causal or direct temporal relationship between aneurysmal formation and anxiety. Therefore, we propose a relational connection between stress and aneurysm and possibly aneurysm and increased emotional distress.

Proposed mechanisms for this connection are 2-fold. The first mechanism may be that an enlarging aneurysm may physically have a “mass effect on the nearby sympathetic ganglion.” This neurohormonal effect may produce panic or generalized anxiety symptoms. The other mechanism, which was suggested by Elefteriades, is that extreme emotional or physical states may lead to sudden sharp increases in blood pressure that might result in aneurysmal dissection in those who may be genetically vulnerable. Genetic vulnerability is important to assess during history taking, because studies suggest that there are higher familial prevalence rates of aneurysm. This hypertension connection may also reflect on the hypothesis that the hypertension resulting as part of an anxiety state may worsen or increase the risk of an aneurysm or aortic dissection.

**AORTIC ANEURYSMS**

Aortic aneurysm—the dilation, bulging, or ballooning out of part of the wall of the aorta—is a silent and often instant killer. About 15,000 Americans die suddenly each year of an abdominal aortic aneurysm (AAA) rupture; this phenomenon is the ninth leading cause of death in men older than 55 years. Rupture occurs because of many risk factors, including atherosclerosis, hypertension, Marfan syndrome, and chronic infections such as syphilis and tuberculosis. There are 2 types of aortic aneurysms: abdominal and thoracic. At diagnosis, about 78% of persons with AAAs and 40% of those with TAAAs are asymptomatic. Symptoms generally occur because of growth of the aneurysm, leading to increased pressure on surrounding organs, or because of rupture of the aneurysm. The symptoms of an aortic aneurysm rupture include sudden severe pain, an extreme drop in blood pressure, and signs of shock. It is important to remember that the diagnostic triad of abdominal or back pain, a pulsatile abdominal mass, and hypotension characterizes rupture of an AAA. Immediate medical treatment is required, or death will occur within minutes. **Abdominal aortic aneurysms** In the United States, 5% to 7% of persons older than 60 years have an AAA. About 48% of AAAs are found clinically, 37% are found incidentally, and 15% are found during an unrelated abdominal operation. Symptoms, often vague and general complaints of abdominal pain or discomfort or a feeling of fullness, can be easily overlooked. Persons younger than 50 are more likely to have symptoms than are persons older than 50. Specific symptoms of an AAA may include the following:

- Pain in the chest, abdomen, or low back, possibly spreading to the groin, buttocks, or legs. The pain may be deep, aching, gnawing, or throbbing and may last for hours or days. It is generally not affected by movement, although certain positions may be more comfortable than others.
- A pulsating sensation in the abdominal area.
- Back pain, if the aneurysm is pressing on the spine.
- A "cold foot" or a black or blue painful toe if an AAA produces a blood clot that breaks off and blocks blood flow to the legs or feet.

**Thoracic aortic aneurysm** is an inflammatory aortic aneurysm. The incidence of TAA is about 6 cases per 100,000 patient-years. TAAs occur most commonly in the sixth and seventh decades of life. Men are affected about 2 to 4 times more often than women. Hypertension is present in 60% of patients, and up to 13% of patients with an aortic aneurysm diagnosis also have multiple aneurysms. In addition, 20% to 25% of patients with a large TAA also have an AAA.
Symptoms of a TAA are most evident when the aneurysm occurs within the aortic arch. Chest pain is the most frequent symptom; it is generally described as deep and aching or throbbing. A cough or shortness of breath may be present if the aneurysm is in the area of the lungs. Hoarseness and difficulty with swallowing or pain while swallowing may also occur. **Screening and Diagnosis**

Even when AAAs are asymptomatic, many are first diagnosed by palpation during a physical examination; many TAAs can be seen on a routine chest radiograph. A higher index of suspicion is necessary for the elderly. Therefore, screening is recommended for men older than 60 years with a family history of aneurysm (especially in male relatives) or a history of tobacco use. It is also recommended for men aged 65 to 75 years without a history of tobacco use, because 22% of AAAs occur in nonsmokers. Following tests typically include CT, MRI, or abdominal ultrasonography for AAAs or transesophageal echocardiography for TAAs. From a referral standpoint, there is no indication that screening for an aortic aneurysm causes increased psychological symptoms or adverse effects. **Treatment**

Immediate surgery is usually required for a dissecting or rapidly enlarging aortic aneurysm. For asymptomatic patients, surgery is indicated for an AAA larger than 5.5 cm, while surveillance is recommended for those with an AAA in the 4- to 5.4-cm range. For patients with a TAA, surgery is recommended if the aneurysm is larger than 6 cm. Certain aortic dissections can be managed with medicine, most commonly an uncomplicated aortic dissection confined to the descending thoracic aorta. There are many classifications that help with aneurysmal stratification that are beyond the scope of this article. From a psychiatrist's standpoint, recognizing the possibility of an aneurysm; emphasizing the appropriate control of critical risk factors, such as hypertension; and ensuring an appropriate referral are essential. **CONCLUSION**

Aortic aneurysms should be considered in the differential diagnosis of anxiety disorders, especially in patients with multiple risk factors for an aneurysm. Furthermore, extreme emotional states may contribute to aneurysmal formation or rupture in persons who may be genetically vulnerable. These at-risk patients are often seen in emergency settings, and psychiatrists are often consulted. Although more research is necessary, considering aneurysms in the differential may well be lifesaving.

**References:**


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