Aortic Intramural Hematoma in a Female Patient During Sexual Intercourse

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Financial support: None declared
Conflict of interest: None declared

Patient: Female, 45-year-old
Final Diagnosis: Aortic intramural hematoma
Symptoms: Chest and back pain
Medication: —
Clinical Procedure: —
Specialty: Cardiology

Objective: Rare coexistence of disease or pathology
Background: Acute aortic syndrome (AAS) is a spectrum of severe life-threatening disease processes that are often initially encountered in the emergency department (ED) setting and require prompt recognition and treatment to prevent significant complications, including death. We describe an atypical presentation of aortic intramural hematoma in a female patient during sexual intercourse, a situation not previously described in the literature.

Case Report: The patient was a 45-year-old woman who presented to the ED with a chief concern of chest pain. Just prior to the onset of her symptoms, the patient was having sexual intercourse with her husband, and during her orgasm she felt a “pop” in her chest with radiation to her back. The patient was diaphoretic and hypertensive on arrival, with a blood pressure of 220/140 mmHg. Computed tomography angiography of the chest was performed and showed an intramural hematoma (or thrombosed dissection) of the distal aortic arch and descending thoracic aorta. In the ED, the patient was started on intravenous antihypertensives, which were eventually switched to oral agents. Cardio-thoracic surgery staff was consulted and recommended medical management. As oral doses were increased, the intravenous antihypertensives were weaned, and the patient was eventually discharged home with scheduled outpatient follow-up.

Conclusions: Intramural aortic hematoma is a form of AAS with independent pathogenesis but similar progression, complications, and treatment as aortic dissection and thus demands efficient diagnosis and treatment. A high degree of suspicion, even in atypical situations, is paramount, as efficient recognition and treatment can be lifesaving.

Keywords: Aneurysm, Dissecting • Aorta, Thoracic • Aortic aneurysm, familial thoracic 4 • Blood Vessels • Case Reports

Full-text PDF: https://www.amjcaserep.com/abstract/index/idArt/936167
**Background**

Acute aortic syndrome (AAS), which includes aortic dissection, aortic intramural hematoma, and penetrating atherosclerotic ulcer, is a severe pathologic process that typically presents with sharp, tearing chest pain with radiation to the back. Complications, including neurological involvement, end-organ damage, and rupture, must be assessed in the physical examination and confirmed with laboratory and imaging results. Rapid blood pressure reduction must be obtained in a timely fashion, and determination of surgical or medical management must be determined. In the present case of an intramural hematoma, severe end-organ damage was avoided; however, the atypical presentation could present challenges in diagnosis and increase likelihood of complications occurring over time.

**Case Report**

The patient was a 45-year-old woman who presented to the Emergency Department (ED) with a chief concern of chest pain. Just prior to the onset of her symptoms, the patient was having sexual intercourse with her husband. She stated that her legs were pressed against her chest and during her orgasm she felt a “pop” in her chest with radiation to her back. The patient described the pain as severe (10/10) and stabbing, with associated dyspnea and nausea. Her vital signs on arrival were a heart rate of 98 beats per min, blood pressure of 220/140 mmHg, respiration rate of 28 breaths per min, and SpO2 of 98% on room air. The patient had a past medical history of hypertension and was previously on an unspecified oral medication; however, she had not taken the medication for longer than 1 year. The patient admitted to an approximately 17-year history of tobacco abuse, stating she currently smoked 6 to 7 cigarettes daily. There were no concerning findings on the physical examination. The patient appeared to be in moderate distress and experienced an improvement in pain with 8 mg of morphine and 100 mcg of fentanyl. A chest radiograph did not show evidence of a widened mediastinum or any other acute abnormalities. The laboratory evaluation showed a normal troponin level, mildly elevated creatine level of 1.74 (unknown baseline, but patient reports no history of chronic kidney disease), and an elevated D-dimer level of 824. An electrocardiogram performed on arrival showed no evidence of ischemic changes, but it did reveal evidence of left ventricular hypertrophy and a prolonged QT interval at 550 ms. Computed tomography angiography of the chest was performed and showed an intramural hematoma (or thrombosed dissection) of the distal aortic arch and descending thoracic aorta, extending from the origin of the left subclavian artery to the aortic hiatus of the diaphragm, with no intrabdominal extension, as seen in **Figures 1 and 2**. Blood pressure control was achieved with 20 mg of hydralazine followed by intravenous (i.v.) esmolol bolus and infusion. She was then placed on a nicardipine infusion, with an adequate reduction in blood pressure to 133/80 mmHg and heart rate to 86 beats per min within 12 h of arrival. The cardio-thoracic surgery team was consulted and recommended medical management with admission to the Internal Medicine service, based on Stanford type B classification. After admission, an arterial line was placed for accurate blood pressure measurement and for titration of i.v. antihypertensives. She was also started on oral labetalol, initially at 100 mg twice daily and eventually increased to a dose of 400 mg twice daily. Amlodipine and Losartan were also added to her regimen, and the final dosages at discharge were 10 mg daily and 100 mg daily, respectively. As oral doses of anti-hypertensives were increased, the...
i.v. antihypertensives were weaned, and the patient was eventually discharged home after a 3-day hospital stay with outpatient follow-up with the Internal Medicine Residency clinic and cardio-thoracic surgery team.

Discussion

AAS has a high mortality rate, which has been described as increasing 1% for every hour a patient is untreated, and up to 22% of cases are undiagnosed at the time of death, indicating a need for prompt recognition and treatment [1,2]. Men have a 2:1 higher incidence of developing AAS, and the peak age of diagnosis is later adulthood, around the age of 65 years [3]. In accordance with the male predominance, some literature has described the occurrence of aortic dissection in male patients during sexual intercourse or during masturbation [4-9]. The risk of sudden cardiac death also shows similar patterns, with an incidence reported at 0.19% in men and 0.16% in women, often noted during masturbation, sexual interaction with prostitutes, or extramarital sexual activity [4].

Sexual activity has been described as a moderate physical activity and has even been described as reaching near-maximum exercise levels [10]. The physiologic response to sexually activity correlates with the physical response and the emotional response. As previously mentioned, the risk of sudden cardiac death during sex has a correlation with adultery, which could be provoking an intensified or unforeseen emotional response that makes a person more predisposed to AAS or sudden cardiac death. The physiological parameters of respiratory rate, heart rate, and blood pressure all increase with sexual intercourse, in correlation with exercise [9]. To translate this into risk factors for AAS, it has been described that the increased heart rate to a level of 110 to 180 beats per min will increase shear stress on the wall of the aorta, and increasing the systolic blood pressure from 30 to 80 greater than baseline could have detrimental outcomes in dissection propagation, especially in an individual with baseline untreated hypertension. Our case is unusual in that our patient was a woman, who represent a smaller proportion of AAS cases, and she was having consensual sexual intercourse with her husband; however, she had baseline risk factors for AAS, including untreated, uncontrolled hypertension and a history of tobacco abuse.

The management of AAS, especially in the ED setting, is either surgical or medical management, as determined by the location of the dissection and extent of injury. The 3 presentations of AAS include aortic dissection, intramural hematoma, and penetrating atherosclerotic ulcer. The pathogenesis of aortic intramural hematoma specifically involves rupture of the vasa vasorum within the medial layer of the aortic wall, in contrast to acute aortic dissection and penetrating atherosclerotic ulcer, in which there is intimal disruption causing extravasation of blood from the lumen into the media [11]. Intramural hematoma as well as the other forms of AAS can be classified by the DeBakey and Stanford systems, with the Stanford classification having more utility from an ED perspective because it defines medical versus surgical management. The Stanford classification includes type A, which describes any process with involvement of the ascending aorta, and type B, which includes involvement of only the descending aorta. Surgical management is indicated only in type A disease or in those patients with severe complications, such as rupture, end-organ damage, and malperfusion. Risk factors of AAS, however, are numerous and commonly include chronic hypertension, acute hypertension, as seen in stimulant use (eg, cocaine), vasculitis, and genetic predisposition (Ehler-Danlos and Marfan syndromes). As is true of aortic dissection and penetrating atherosclerotic ulcers, most cases of intramural hematoma are classified as Stanford type B and are therefore treated with medical management; however, the risk of periaortic hematoma, pericardial effusion, and rupture into the mediastinum occurs more frequently with intramural hematoma [12]. Intramural hematomas have the risk of propagation into dissection with intimal disruption if not effectively treated appropriately and are therefore treated as similar disease processes on the spectrum of AAS.

Management of AAS requires adequate blood pressure management to a systolic measurement of <120 as well as a heart rate less than 60 beats per min to reduce aortic wall stress. Beta blockade is the initial pharmacological intervention of choice, with esmolol being preferred. Additional blood pressure control can be obtained with vasodilators after the initiation of a beta blocker. Timely initiation of oral agents will allow titration of i.v. antihypertensives and prevent extended hospitalizations.

Conclusions

An aortic intramural hematoma in 45-year-old woman during sexual intercourse, as seen in the patient in our case, is not a commonly reported occurrence. Understanding the physiologic changes and stress of sexual intercourse and how this effects hemodynamics can help predict adverse outcomes in patients with pre-existing cardiovascular risk factors. Prompt recognition of AAS in populations with risk factors and consistent symptoms despite a common presentation can lead to earlier management, whether via surgical or medical intervention.

Department and Institution Where Work Was Performed

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Declaration of Figures’ Authenticity

All figures submitted have been created by the authors who confirm that the images are original with no duplication and have not been previously published in whole or in part.

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