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Case Report

Six-Year Survival With Pharmacological Management in a Patient With Aneurysmal Aortic Dissection and Severe Heart Failure: A Case Report

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ABSTRACT

Prolonged survival with pharmacological management alone in patients with Stanford type A aneurysmal aortic dissection remains uncommon. We herein describe an elderly woman with severe heart failure (left ventricular ejection fraction [LVEF]: 15%–20%), a 9-cm aortic root aneurysm, and a restrictive dissection flap extending from the root to the abdominal aorta who has survived 6 years under medical therapy.

The patient had a history of mild hypertension previously undertreated with oral antihypertensive agents. Remarkably, she maintained routine daily activities despite medical advice to the contrary. Serial examinations during this period demonstrated a 5% decline in LVEF and a 1 cm expansion of the aneurysm diameter, while the dissection flap remained stable.

This case suggests that conservative pharmacological management in Stanford type A aortic dissection with large root aneurysm and severe LV systolic dysfunction (particularly in older, less active patients) may yield favorable outcomes. Nonetheless, we emphasize that this approach should only be considered for patients who are not candidates for other treatment options. ***(Iranian Heart Journal 2025; 26(3): 83-91)***

KEYWORDS: Aortic dissection, Aneurysm, Heart failure, Type A Stanford, Type 2 Debakey

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Aortic dissection occurs when extraluminal blood penetrates the aortic wall through an intimal tear, separating the wall layers, a hallmark pathological feature of this condition. [1] This life-threatening cardiovascular emergency carries significant morbidity and mortality, with an estimated incidence of 2 to 3 cases per 100,000 individuals annually. [2]

Aortic dissections are classified by several criteria, including anatomical extent. Proximal dissections involving the ascending aorta are categorized as DeBakey type I or II, corresponding to Stanford type A, while distal dissections affecting the descending aorta are classified as DeBakey type III or Stanford type B. [3] Among acute aortic dissections, approximately two-thirds are type A, with the remainder being type B. [4]

Aortic dissection is classified temporally as acute when diagnosed within 2 weeks of symptom onset, and chronic when detected beyond this period. [5] The natural history of untreated acute type A dissection carries a grave prognosis, with mortality rates estimated at 1% per hour during the initial phase. [6] Cumulative mortality reaches 50% by day 3 and nearly 80% by week 2, [7] underscoring the critical importance of early diagnosis and intervention.

The management approach differs by anatomical classification: surgical repair represents the gold standard for type A dissections, whereas medical therapy serves as first-line treatment for most type B cases. [8] For patients with acute type A dissections, emergent surgical intervention is essential to prevent catastrophic outcomes. Pharmacological management focuses on controlling predisposing conditions (particularly hypertension) and typically includes beta-blockers, angiotensin-converting enzyme inhibitors, statins, and anticoagulants/antithrombotic agents. [9]

Different methods are used for heart surgery and aortic dissection treatment, including open heart surgery and endovascular aortic repair. [10] In open heart surgery, employed for type A aortic dissection, the torn part of the aorta is replaced with a graft if needed; otherwise, the tear is repaired with a stent. Endovascular repair is reserved for type B dissection or when heart surgery is contraindicated. During this procedure, a stent is placed inside the aorta to seal the tear and prevent intra-aortic bleeding [11]

We present the exceptionally rare case of an 89-year-old woman with severe heart failure, coexisting aortic dissection, and a large aortic aneurysm who survived for 6 years without surgical intervention or other procedures.

CASE PRESENTATION

The patient was an 89-year-old woman who presented to the emergency department with epigastric pain radiating retrosternally (without distinctive characteristics), accompanied by nausea, vomiting, and mild dyspnea. Her medical history was significant only for mild hypertension diagnosed at age 50. On physical examination, she appeared alert and oriented (GCS 15) without signs of respiratory distress. She exhibited mild generalized weakness and anorexia, with oxygen saturation of 96% on room air, an irregular pulse of 70 beats per minute, and a respiratory rate of 16 breaths per minute. Blood pressure measurements showed 130/80 mm Hg in the right arm and 120/75 mm Hg in the left arm. Auscultation revealed mild bilateral basilar fine rales, while jugular venous pressure appeared normal. Peripheral pulses were weak throughout, with notably weaker radial and brachial pulses on the left than on the right, and symmetrically diminished pulses in the lower extremities. The epigastrium was non-tender to palpation. Her medication regimen included metoprolol succinate (25 mg twice daily), pantoprazole (40 mg daily), and alprazolam (0.25 mg every 8 hours).

Laboratory results showed elevated blood urea (80 mg/dL; reference 17–43), creatinine (1.5 mg/dL; reference 0.6–1.3), and alanine aminotransferase (67 U/L; reference 6–36), along with decreased hemoglobin (10.3 g/dL; reference 12–16). The D-dimer level was positive at 614 ng/mL (cutoff > 500), while troponin was negative. ECG revealed atrial fibrillation with normal ventricular response and poor R-wave progression, without evidence of acute ischemia (Figure 1).

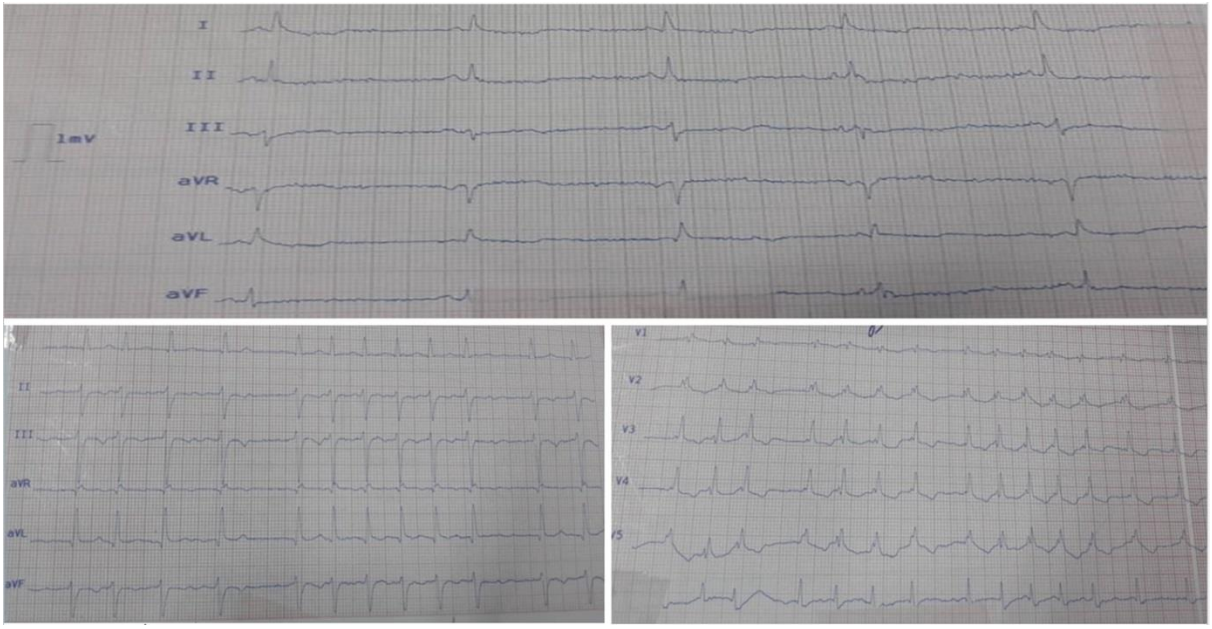

Figure 1. The patient's ECG shows sinus rhythm and atrial fibrillation rhythm while demonstrating no evidence of acute ischemia.

The chest X-ray demonstrated cardiomegaly with a widened mediastinum and blunting of the left costophrenic angle (Figure 2). Abdominal and pelvic ultrasound with spiral computed tomography (CT) showed no abnormalities or free fluid. Transthoracic echocardiography (TTE) revealed severely reduced left ventricular function (left ventricular ejection fraction [LVEF] = 20%) with marked LV dilation (7 cm diameter) and global hypokinesis. The study identified a massively dilated aortic root (9 cm diameter) with aneurysmal formation and severe aortic regurgitation. A dissection flap extended from the aortic root to the abdominal aorta. Additional findings included no pericardial effusion, right ventricular compression owing to the aneurysm, severe mitral regurgitation with central jet, and moderate left atrial enlargement (Figure 3). CT angiography of the aorta and coronary arteries revealed normal epicardial coronary arteries alongside a 10 cm aortic root aneurysm and a dissection flap extending from the aortic root to the abdominal aorta (Figures 4 and 5).

Although deemed a surgical candidate, the patient declined operative intervention. She was, consequently, managed pharmacologically with heart failure medications and rate control therapy, including nitroglycerin, statins, aspirin, losartan, pantoprazole, diuretics, beta-blockers, and anxiolytics. Following symptomatic improvement, she was discharged. Subsequently, the patient experienced multiple hospital admissions for dyspnea and palpitations, each time demonstrating clinical improvement with medical management alone before being discharged.

No arrhythmias were noted in the patient, except for atrial fibrillation. The patient engaged in daily activities despite the physician's recommendations and exhibited functional class II dyspnea. According to her most recent TTE, her LVEF was 15%, her LV size measured 7 cm, and her aortic root size was 10 cm, accompanied by a mobile dissection flap. Despite the treatment team's concerns and the lack of curative intervention, she maintained her normal daily activities and has survived to the present, an outcome that remains clinically remarkable.

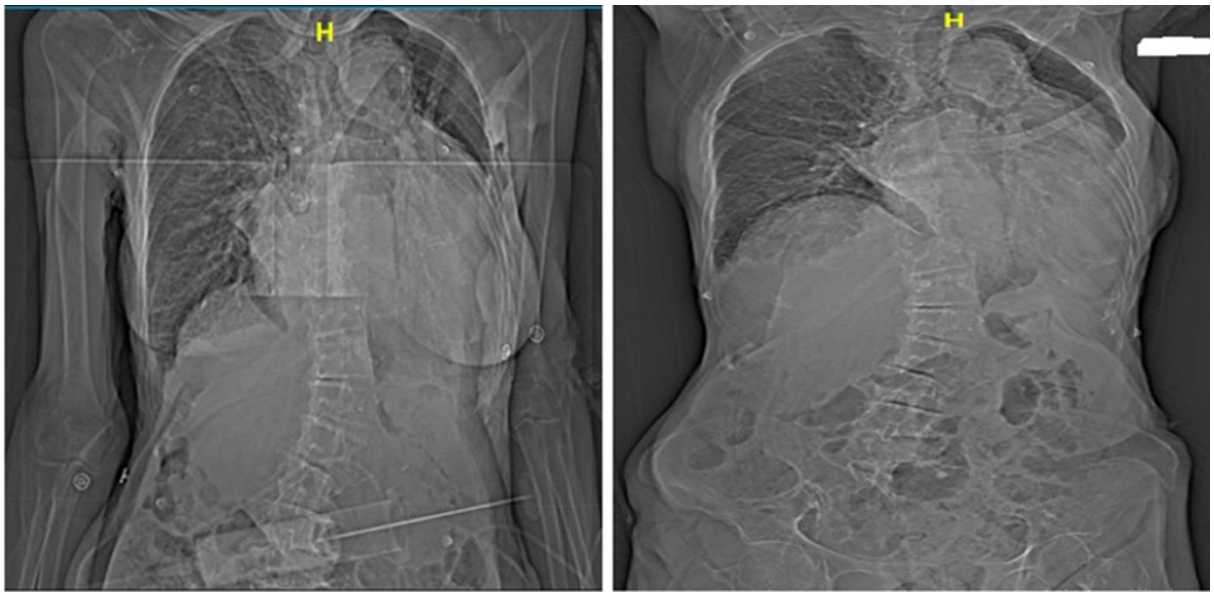

Figure 2. The patient's chest X-ray shows a widened mediastinum and cardiomegaly, along with a blunted left costophrenic angle.

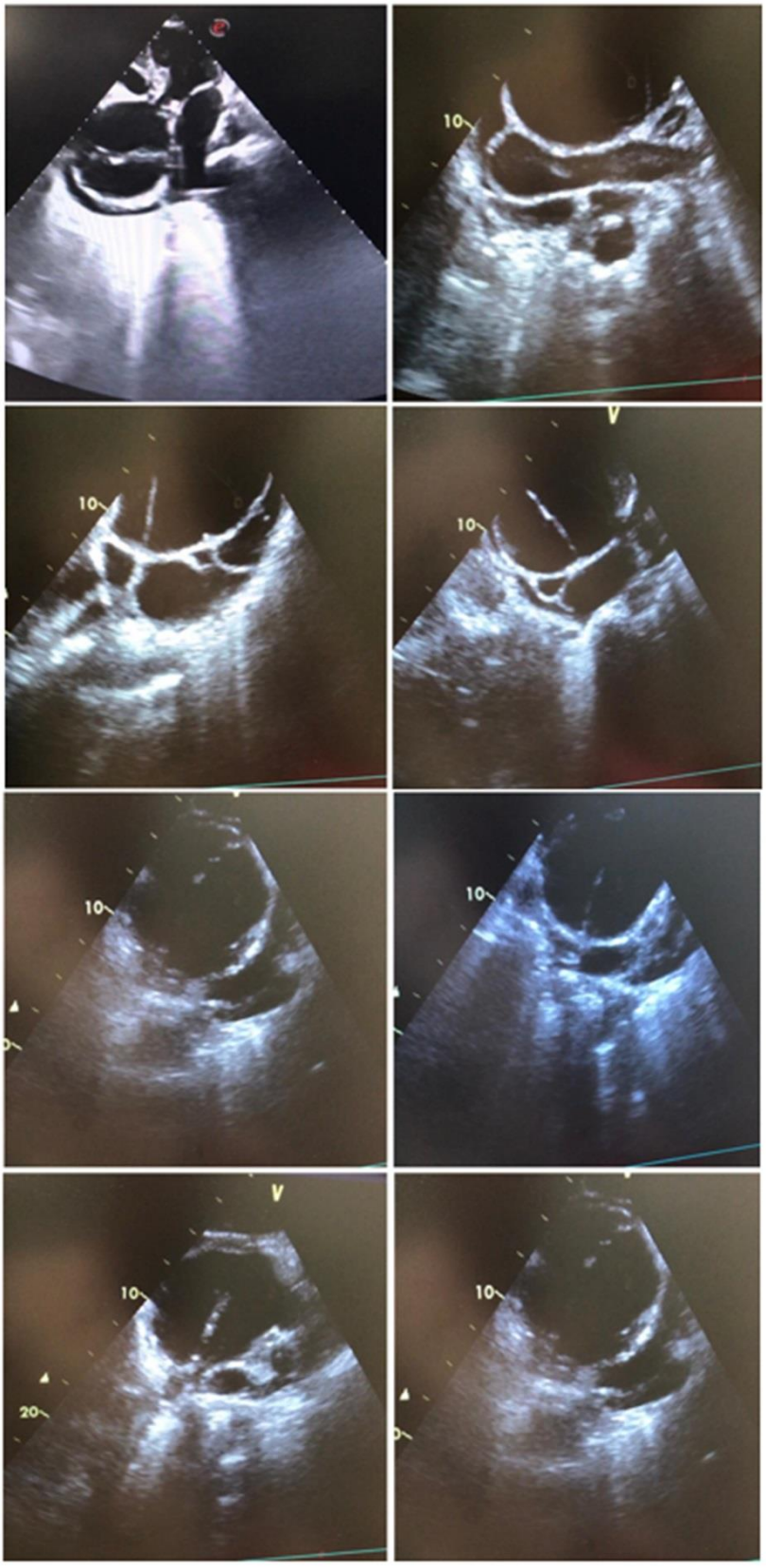

Figure 3. A transthoracic echocardiogram with multiple standard views reveals a large aortic root aneurysm and severe left ventricular enlargement.

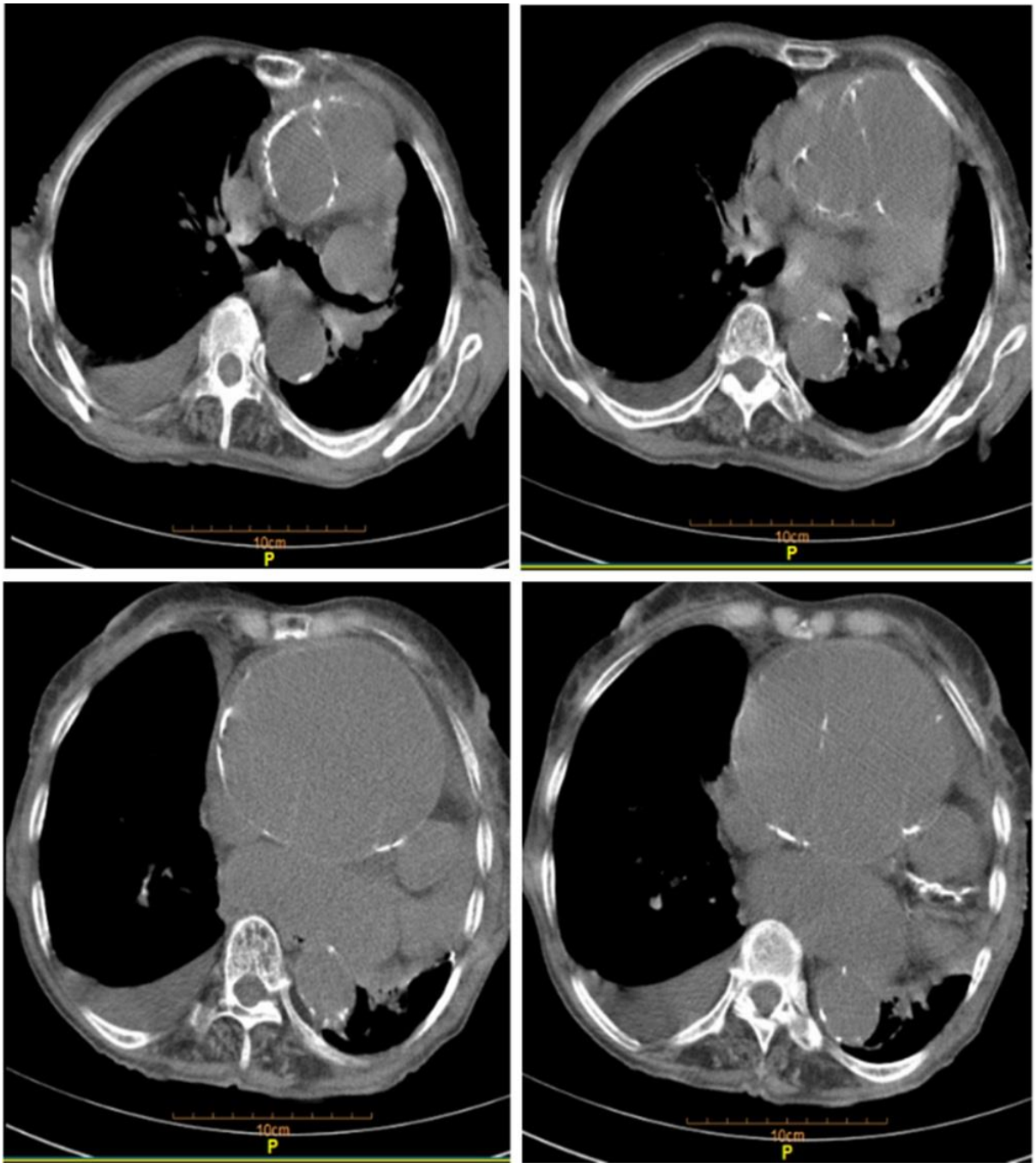

Figure 4. Computed tomography angiography of the aorta shows a severely dilated aorta, accompanied by a dissection flap.

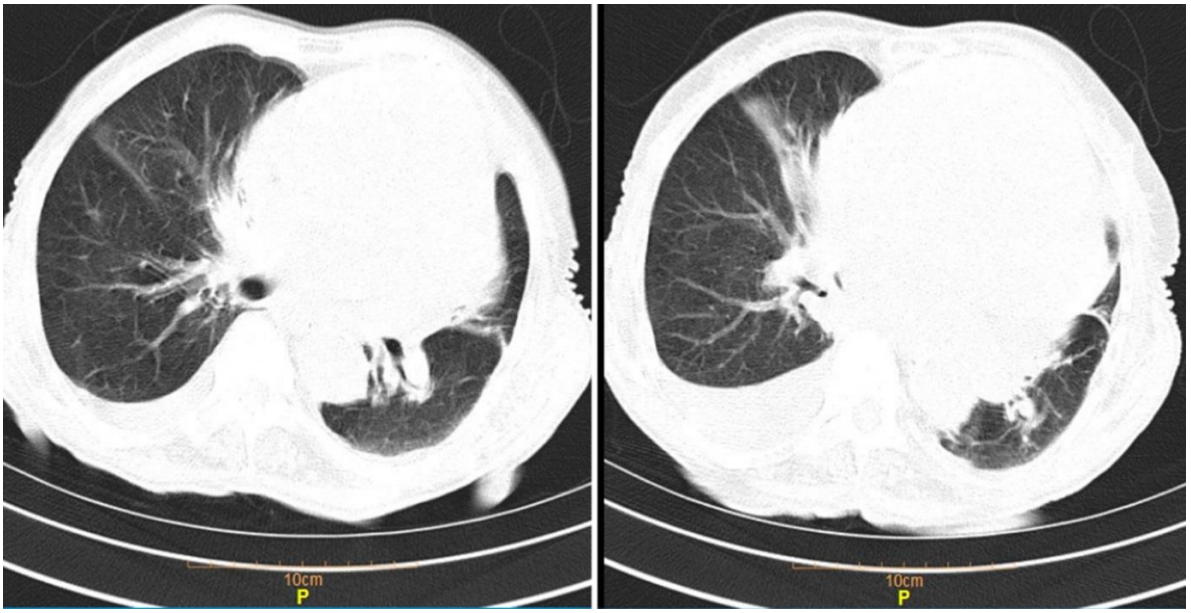

Figure 5. Pulmonary computed tomography angiography shows cardiomegaly without significant pulmonary artery stenosis.

DISCUSSION

We present a unique case of Stanford type A aneurysmal aortic dissection with severe heart failure managed without surgical intervention. To our knowledge, this represents the first reported instance of such a clinical scenario in the medical literature. The coexistence of aortic dissection with a 10 cm aortic aneurysm typically carries grave prognostic implications, as aneurysms exceeding 5 cm in diameter demonstrate significantly increased rupture risk. [12] Without intervention, approximately one-third of these patients experience aortic rupture within 1 month of diagnosis, whereas those with unruptured aneurysms have a mean survival of under 3 years when managed medically. [13]

Aortic dissection remains a life-threatening condition, with current mortality rates of 25% to 30% despite diagnostic and therapeutic advances. Stanford type A dissection carries a particularly grave prognosis as it demonstrates up to 50% mortality within 48 hours without surgical intervention. [14] While surgical repair remains the definitive treatment for type A dissections (with associated mortality of 15%–30%), medical management alone results in significantly higher mortality (60%). [15, 16]

In the present case, the patient's spontaneous bradycardia, low body weight, and small physique may have contributed to reduced cardiac demand and workload, potentially influencing her unusual clinical course.

Aortic dissection is most commonly reported in the sixth to eighth decade of life. Women typically have dissections later in life than men. Further, dissection is approximately twice as common in men as in women. Nevertheless, more than 50% of dissection patients older than 70 years are female. Women are more likely to have pericardial or pleural effusions, hypotension, and pericardial tamponade. Women also have higher surgical mortality than men. A wide array of clinical signs and symptoms can be present for acute aortic dissection. This challenges the diagnostic understanding of even the most astute clinician. [17]

The patient had a documented history of hypertension, which represents the most significant risk factor for aortic dissection. Existing literature demonstrates that 62% to 78% of aortic dissection patients present

with chronic hypertension, with a higher prevalence in proximal (type A) than in distal (type B) dissections (70% vs. 35%).
The classic presentation of type A dissection involves sudden-onset, severe anterior chest pain in hospitalized patients. In contrast, type B dissections more frequently manifest with abdominal, back, or lower extremity pain. Notably, nausea and vomiting occur in fewer than 5% of cases. [3, 18]
Interarm blood pressure differences and pulse deficits serve as important clinical indicators of aortic dissection. Studies demonstrate that 31% of patients with thoracic aortic dissection exhibit blood pressure differentials or pulse deficits, with 30% to 50% of dissection cases presenting pulse deficits overall. A pulse deficit, defined as a weak or absent carotid, femoral, or brachial pulse, represents a critical physical exam finding, as its presence correlates with increased mortality. [19, 20]
This case demonstrates that acute aortic dissection does not always follow conventional clinical expectations. The patient's 6-year survival with conservative management represents an exceptionally rare outcome given the typically life-threatening nature of this condition. When the distal dissection flap contains an opening, such as one created by atherosclerotic plaque, blood entering the false lumen may exit through this defect, which effectively converts the false lumen into a parallel flow channel. This physiological adaptation likely contributed to the remarkably slow progression of the dissection in this case.

CONCLUSIONS

In select cases, conservative pharmacological management may yield favorable outcomes for patients with Stanford type A aortic dissection, large aortic root aneurysms, and severe LV systolic dysfunction, particularly in elderly individuals with limited physical activity. Still, this approach should only be considered for patients who are not candidates for or decline standard treatment options.

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Ethical Statement
This study was designed based on the ethical principles of the Declaration of Helsinki (2008) for medical studies involving humans. The Ethics Committee affiliated with Shahroud University of Medical Sciences approved this study (Registration no.: IR.SHMU.REC.1403.073).

Consent
The authors confirm that written consent for the submission and publication of this case report, including images and associated text, has been obtained from the patient in accordance with COPE guidance.

Conflict of Interest
None.

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