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Pulmonary Tuberculosis Revealed by A Fusiform Coronary Aneurysm in A Patient with Acute Myocardial Infarction

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ABSTRACT
Background: Coronary artery aneurysms (CAA) are rare (0.3 – 4.9 % of angiograms) and most often due to atherosclerosis. Granulomatous infections such as tuberculosis (TB) are an exceptional cause.
Case summary: A 53-year-old Mexican man presented with an extensive anterior ST-segment-elevation myocardial infarction. Coronary angiography revealed an 8-mm fusiform aneurysm in the proximal left-anterior-descending artery with preserved TIMI III flow and no obstructive lesions. Targeted history uncovered a two-year chronic cough and weight loss. Serial sputum smears were negative, but GeneXpert MTB/RIF was positive, confirming pulmonary TB. First-line antituberculous therapy was initiated; the patient remained hemodynamically stable without recurrent ischemia.
Discussion: In TB-endemic regions, Mycobacterium tuberculosis should be considered when a CAA lacks an atherosclerotic explanation. Advanced imaging plus microbiologic testing allows accurate diagnosis and may avert unnecessary coronary intervention, as antituberculous therapy alone can lead to aneurysm regression.
Learning points: Non-atherosclerotic CAAs mandate a broad etiologic work-up, including infections. Pulmonary TB may present solely with cardiovascular complications. GeneXpert MTB/RIF is a rapid, sensitive tool in acute settings. Multidisciplinary management (cardiology + infectious diseases) could optimize outcomes.

KEYWORDS: Coronary Aneurysm – Tuberculosis, Pulmonary – Myocardial Infarction – Granulomatous Arteritis – Angiography – Case Reports

I. INTRODUCTION

Coronary artery aneurysms are uncommon findings, with an estimated incidence of 0.3 % to 4.9 % in patients undergoing coronary angiography [1]. In adults, atherosclerosis is the most frequent etiology, accounting for more than 50 % of cases [2]. In children, Kawasaki disease is the leading cause. Other etiologies include systemic vasculitis, infections, congenital anomalies, and complications following percutaneous coronary intervention [3]. In Mexico, pulmonary tuberculosis remains a persistent publichealth problem. Data from the Ministry of Health and the World Health Organization show an incidence of approximately 23 cases per 100 000 inhabitants in 2022 [4,5]. This prevalence reflects ongoing circulation of *Mycobacterium tuberculosis* in the general population, which becomes especially relevant when evaluating patients with chronic respiratory symptoms or unusual clinical findings.

Although rare, tuberculosis can induce granulomatous arteritis of the coronary vessels, producing aneurysms in the absence of atherosclerosis. Early identification is crucial for appropriate, targeted management [6].

II. CASE REPORT

A 53-year-old man from the state of Guerrero, Mexico, who had stopped smoking five years earlier, was admitted to the emergency department with sudden-onset oppressive chest pain radiating to the left arm, accompanied by diaphoresis and dyspnea. The electrocardiogram showed ST-segment elevation in the precordial leads [Image 1], establishing the diagnosis of an extensive anterior ST-segment-elevation myocardial infarction; the patient was therefore transferred emergently to the catheterization laboratory.

Coronary angiography revealed an ~8-mm fusiform aneurysm in the proximal segment of the left anterior descending artery with preserved TIMI III anterograde flow [Image 1]. No significant atherosclerotic lesions were noted in the remaining coronary tree, and no percutaneous intervention was performed in view of the absence of flow-limiting stenosis.

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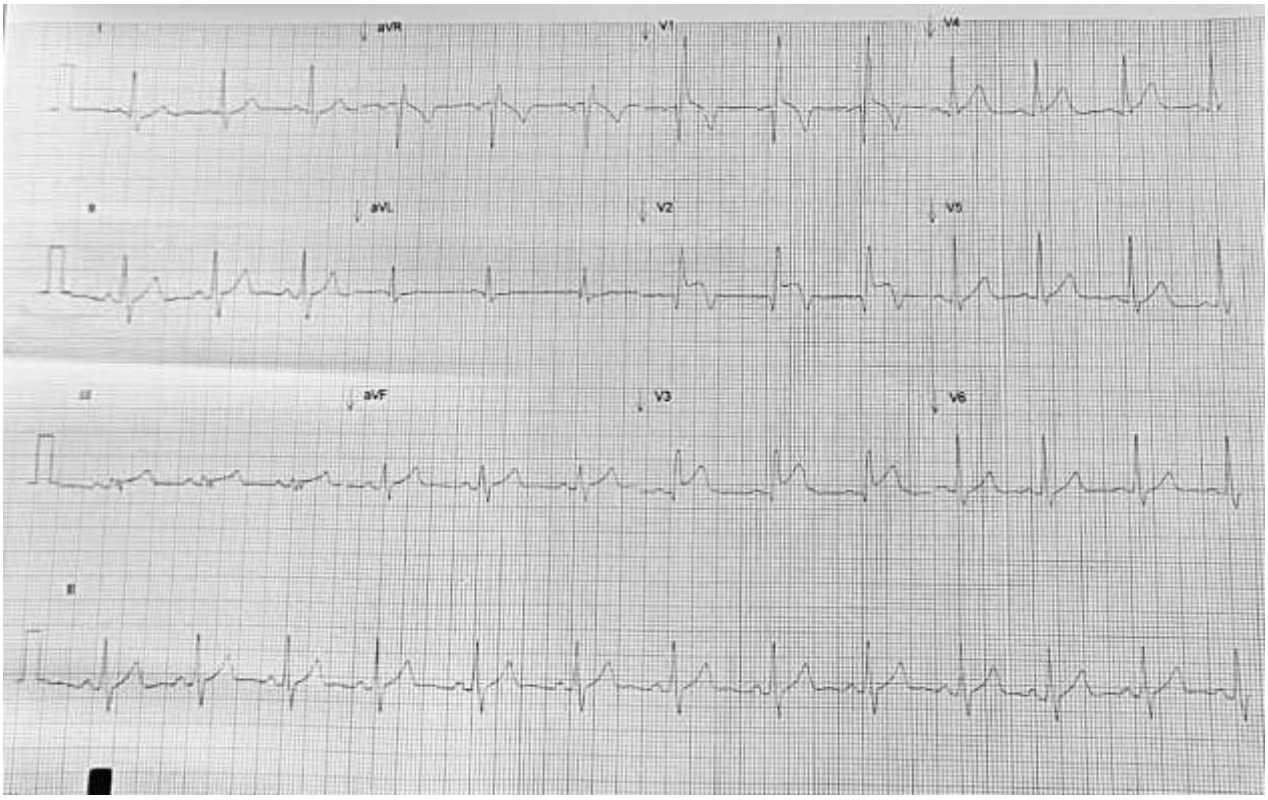

Image 1. Anterior subepicardial injury pattern on a 12-lead electrocardiogram.

To determine the aetiology of the coronary aneurysm, additional studies were ordered. HIV serology was negative. On directed questioning, the patient reported a two-year history of chronic, occasionally productive cough and unquantified involuntary weight loss. Given these symptoms and his geographic background, serial sputum smears, a GeneXpert MTB/RIF assay, and culture for Mycobacterium tuberculosis were obtained. The molecular assay was positive, confirming pulmonary tuberculosis.

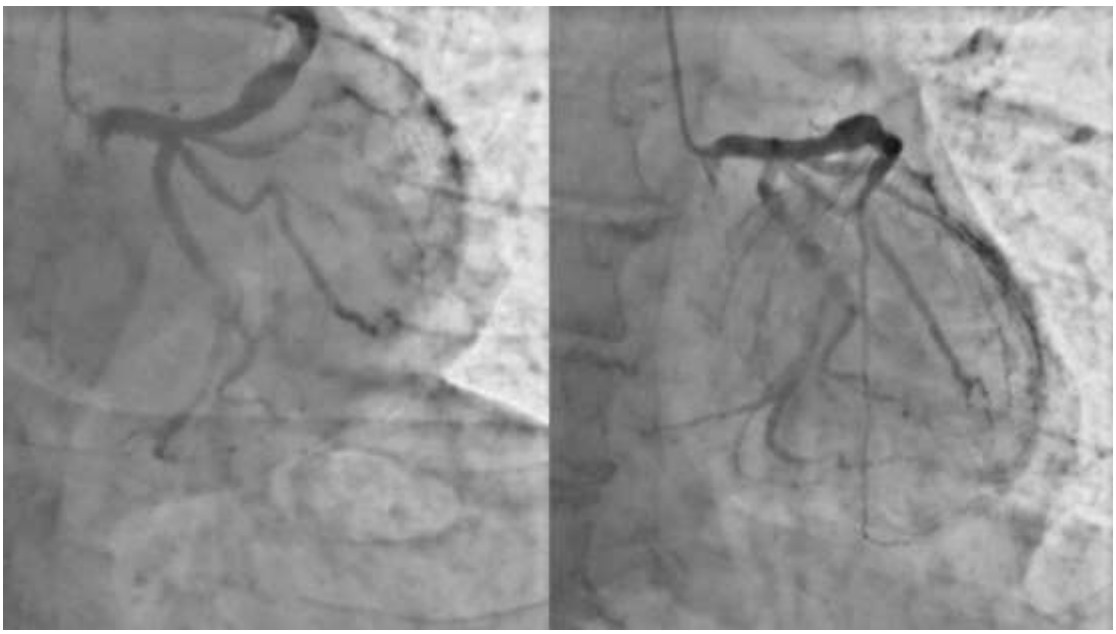

Image 2. Fusiform aneurysm in the proximal segment of the left anterior descending artery.

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The patient was referred to the Infectious Diseases service and started on first-line antituberculous therapy according to national guidelines. His clinical course was favourable, with no recurrence of ischaemic symptoms and stable haemodynamic status throughout his hospital stay.

III. DISCUSSION

A coronary aneurysm is a rare condition, defined as a focal or diffuse dilatation of a coronary artery that exceeds 50 % of the diameter of the adjacent normal segment [1]. In adults, atherosclerosis is the most common cause, accounting for more than 50 % of cases [2]. When an aneurysm is detected in the absence of stenotic lesions or angiographic signs of atherosclerotic coronary disease—as in the present case—less frequent aetiologies such as vasculitis, connective-tissue disorders, and infections must be investigated [3].

Tuberculosis as a cause of coronary arteritis is uncommon but has been described in the medical literature. Case reports document an association between active tuberculosis and the development of coronary aneurysms, with resolution after antituberculous therapy. Barreto-Neto et al. reported a patient with cutaneous tuberculosis who developed a non-ST-elevation myocardial infarction accompanied by aneurysms in the left anterior descending artery; the aneurysms disappeared after completion of specific therapy, without percutaneous or surgical intervention [6]. This pattern suggests that granulomatous inflammation induced by Mycobacterium tuberculosis can weaken the coronary arterial wall and promote aneurysmal dilatation.

Vascular involvement by tuberculosis is better documented in large vessels such as the aorta or pulmonary arteries; Rasmussen aneurysm in cavitary disease is a classic example. Pathogenesis involves granulomatous invasion of the vessel wall with destruction of the media and adventitia [7,8]. A similar mechanism is postulated, though less well evidenced, in coronary arteries.

In our patient, the combination of a coronary aneurysm without atherosclerotic lesions, chronic respiratory symptoms, origin from an endemic region, and a positive microbiologic diagnosis for M. tuberculosis strongly supports an infectious aetiology. Although no vascular biopsy was obtained to confirm arteritis histologically, the clinical and epidemiological profile suggests a causal relationship.

The diagnostic work-up for a suspected coronary aneurysm should begin with coronary angiography to establish type (fusiform or saccular), location, and distal flow. Non-invasive imaging—such as three-dimensional cardiac CT—can refine size and extent, while cardiac MRI can provide information on active inflammation or mural thrombosis [9]. In the absence of significant atherosclerosis, the evaluation must be expanded with serologic and microbiologic tests aimed at secondary causes. These include autoimmune panels (ANCA, ANA, IgG4), serology for HIV and syphilis, and tuberculosis assays such as GeneXpert MTB/RIF, smear microscopy, or culture [4,5]. Although not routine, PET-CT may be useful for detecting active arterial inflammation [10].

Management of coronary aneurysms depends on aetiology, size, symptoms, and risk of complications. In TB-associated cases, limited evidence indicates that medical therapy with antituberculous drugs can induce regression of the aneurysm without invasive intervention, provided there are no signs of imminent rupture or significant thrombosis [6,8].

Experience with infectious coronary aneurysms remains scarce, yet this case highlights the need to consider uncommon causes such as tuberculosis when confronted with atypical findings in an appropriate epidemiological context. A systematic diagnostic approach—combining advanced imaging and microbiologic studies—and close coordination between cardiology and infectiousdisease teams are essential to deliver individualized and effective care.

IV. CONCLUSION

This case demonstrates how a common infectious disease in countries such as Mexico—pulmonary tuberculosis—can present atypically as a rare cardiovascular complication: a coronary aneurysm. The absence of significant atherosclerotic disease, combined with a chronic respiratory presentation and microbiologic confirmation of Mycobacterium tuberculosis, allowed a plausible association between the two entities to be established.

When a coronary aneurysm lacks an obvious atherosclerotic explanation, the diagnostic approach must be broadened to include less common causes, notably chronic infections. In TB-endemic regions, this disease should be considered especially in patients with a respiratory history, suggestive imaging findings, and epidemiological risk factors.

The case underscores the need for an integral cardiovascular perspective in which the diagnostic work-up addresses not only conventional but also less frequent aetiologies that may carry significant clinical implications. It likewise highlights the value of

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multidisciplinary collaboration between cardiology and infectious-disease teams to achieve accurate diagnoses and effective treatments in complex clinical scenarios.

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