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Chronic Total Occlusion of the Left Main Coronary Artery Revealed by an Acute Coronary Syndrome: A Rare Case from Senegal

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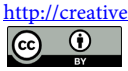

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Abstract

Introduction: Congenital coronary anomalies are rare but may present as serious clinical events, sometimes mimicking acute coronary syndromes. Chronic total occlusion (CTO) of the left main coronary artery (LMCA) is exceptionally rare and is often discovered incidentally or during evaluation of chest pain. **Case Presentation:** We report, after informed consent, the case of a 69-year-old hypertensive, dyslipidemia and obese woman presenting with resting angina. ECG and blood tests were consistent with NSTEMI. Transthoracic echocardiography demonstrated a preserved ejection fraction with regional wall motion abnormalities. Coronary angiography revealed a chronic total occlusion of the LMCA with collateral circulation. Cardiac CT confirmed a single coronary artery arising from the right anterior sinus with a normal course, excluding a congenital anomaly of origin (ANOCOR). She was subsequently referred for coronary artery bypass grafting. **Discussion:** Chronic total occlusion of the LMCA is extremely rare, with an estimated incidence of 0.03% to 0.06%. Atherosclerosis is the principal etiology. This diagnosis requires careful image interpretation, correlation with clinical findings, and assessment of collateral networks. Multimodality imaging, particularly coronary CT angiography, plays a key role in confirming the diagnosis and ruling out congenital variants associated with myocardial ischemia. **Conclusion:** This case highlights the need to consider LMCA chronic occlusion in the differential diagnosis of acute coronary syndromes, especially in elderly patients. It also underlines the value of multimodal imaging in achieving an accurate diagnosis and guiding management.

Subject Areas

Cardiology

Keywords

Acute Coronary Syndrome, Chronic Total Occlusion, Left Main Coronary Artery, Multimodality Imaging, Senegal

1. Introduction

Chronic total occlusion (CTO) of the left main coronary artery (LMCA) is a rare and life-threatening condition, accounting for less than 0.1% of coronary artery disease cases, most commonly due to atherosclerosis [1] [2]. Its clinical presentation is highly variable, ranging from stable angina to acute coronary syndrome (ACS) [3]. Diagnosis is often incidental, made during coronary angiography for chest pain, and requires detailed imaging to exclude congenital coronary anomalies (ANOCOR). Multimodality imaging—combining coronary angiography and cardiac CT—is crucial to confirm vessel origin, assess collateral circulation, and guide therapeutic management [4] [5]. We report an exceptional case from Senegal of LMCA CTO revealed by ACS in a patient with no prior cardiac history, after obtaining informed consent.

2. Case Presentation

A 69-year-old hypertensive, dyslipidemia and obese woman, with no known cardiac history, was admitted for resting anginal chest pain lasting 48 hours. On admission, the ECG showed lateral ST-segment depression, and high-sensitivity troponin levels were five times the upper limit of normal, consistent with a non-ST elevation myocardial infarction (NSTEMI). Transthoracic echocardiography revealed a preserved left ventricular ejection fraction (LVEF) of 58%, limited hypokinesia only at the inferobasal wall.

Urgent coronary angiography revealed a chronic, calcified ostial occlusion of the left main coronary artery, with collateral supply from a dominant right coronary artery (**Figure 1** and **Figure 2**). Both the left anterior descending and circumflex arteries were perfused retrogradely via Rentrop grade 3 collaterals. Given the unusual angiographic findings, a coronary CT scan was performed (**Figure 3**), showing a single coronary artery originating from the right anterior sinus with a normal course, thus ruling out a congenital anomaly of origin (ANOCOR). The final diagnosis was a chronic LMCA occlusion due to atherosclerotic coronary artery disease. She was subsequently referred for coronary artery bypass grafting.

3. Discussion

Chronic total occlusion (CTO) of the left main coronary artery (LMCA) is an extremely rare and potentially fatal condition. Its incidence is estimated between

0.03% and 0.06% in patients undergoing coronary angiography [1]. Atherosclerosis is the most common etiology, although congenital anomalies, dissections, and postoperative complications have also been reported [2] [6].

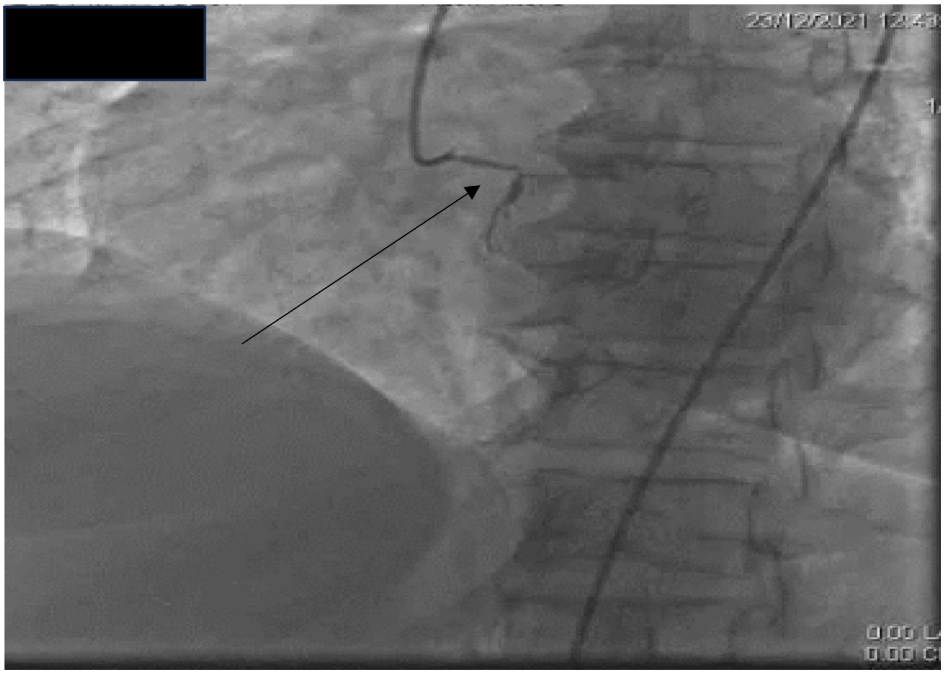

Figure 1. Coronary angiography image showing left main occlusion (see arrow).

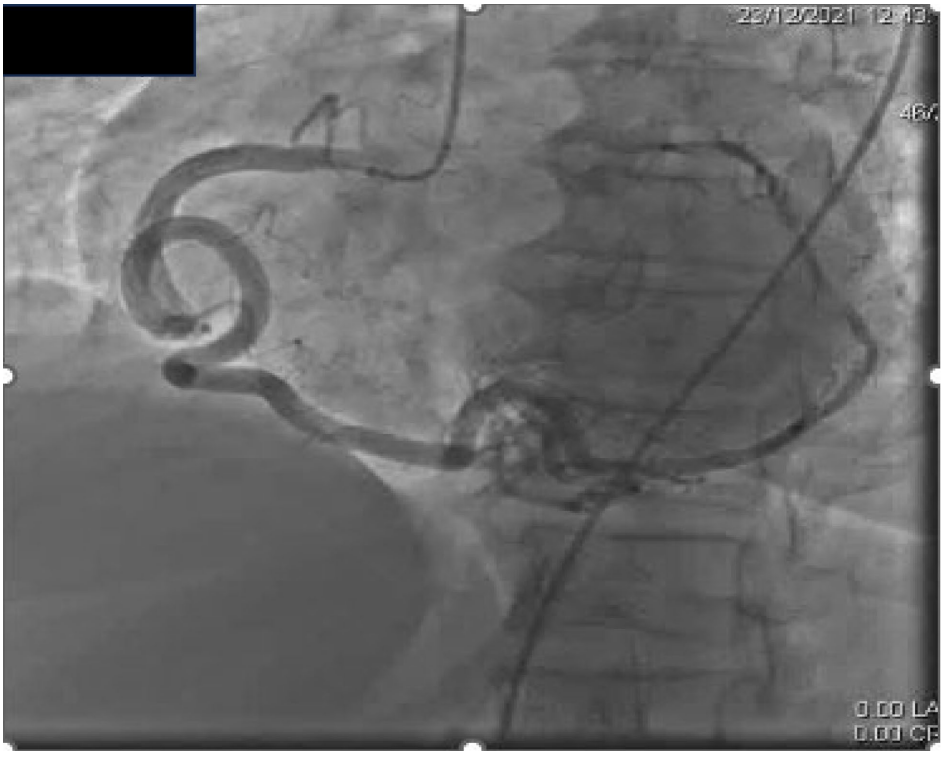

Figure 2. Coronary angiography image showing a dominant right coronary artery supplying the territory of the left main occlusion.

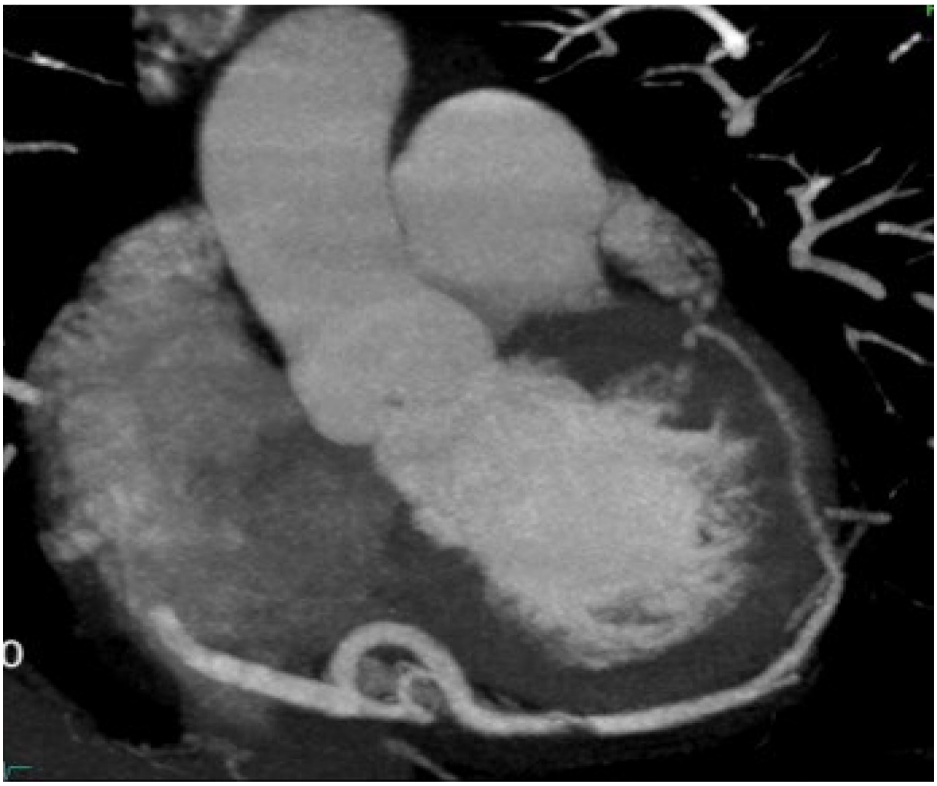

Figure 3. CT scan image showing a dominant right coronary artery supplying the territory of the left main occlusion.

Clinical presentation is heterogeneous, ranging from stable angina to acute coronary syndrome, as in our case. This variability is largely determined by the presence and efficiency of collateral circulation [7]. In our patient, well-developed collaterals from the right coronary artery likely mitigated symptom severity despite critical anatomic disease.

Diagnosis of LMCA CTO requires careful angiographic assessment. In our case, multimodality imaging played a central role: cardiac CT confirmed a single coronary artery arising from the right anterior sinus with a normal course, excluding a high-risk congenital coronary anomaly (ANOCOR) [4] [5]. This step is crucial, as some congenital variants (e.g., inter-arterial or intramural courses) may mimic or coexist with atherosclerotic lesions.

Chronic total occlusion (CTO) of the left main coronary artery (LMCA) remains one of the rarest and most challenging entities in interventional cardiology. While previous reports have described LMCA CTO as an incidental finding or in the setting of stable angina, our case stands out by its presentation as an acute coronary syndrome (NSTEMI) with well-compensated collateral circulation. Sugiura *et al.* (2005) and Girsky *et al.* (1982) previously reported similar LMCA CTOs, yet most lacked the combined use of contemporary multimodality imaging to clarify the underlying anatomy [1] [2]. Unlike cases where congenital anomalies such as ANOCOR were confirmed or suspected, our case distinctly benefited from cardiac CT, which definitively ruled out such anomalies by demonstrating a single coro-

nary artery with a normal course. Furthermore, the setting of sub-Saharan Africa, where access to advanced imaging is limited, enhances the uniqueness and clinical relevance of this report. Thus, this case not only illustrates a rare diagnosis but also highlights the critical role of imaging in resource-limited settings, contributing meaningfully to the global understanding of LMCA CTOs.

Management should be guided by a multidisciplinary team. Although surgical revascularization is often indicated, treatment strategy must be individualized, particularly in oligosymptomatic patients with functional collateral supply. The utility of cardiac CT in such integrated evaluation is now well established [5].

4. Conclusion

Chronic total occlusion of the left main coronary artery is a rare but serious condition that may present as an atypical acute coronary syndrome. This case highlights the importance of thorough angiographic evaluation and the systematic use of multimodality imaging—particularly cardiac CT—to confirm the diagnosis and rule out congenital coronary anomalies. Multidisciplinary management remains crucial to tailor the therapeutic strategy to the clinical context.

Conflicts of Interest

The authors declare no conflicts of interest.

References

[1] Sugiura, T., Iwasaki, T., Nishikawa, H., *et al.* (2005) Chronic Total Occlusion of the Left Main Coronary Artery. *Circulation Journal*, **69**, 772-775.

[2] Girsky, M.J., Belsky, J.L. and Harari, D. (1982) Chronic Total Occlusion of the Left Main Coronary Artery. *American Heart Journal*, **103**, 468-469.

[3] Patel, M.R., Calhoon, J.H., Dehmer, G.J., Grantham, J.A., Maddox, T.M., Maron, D.J., *et al.* (2017) ACC/AATS/AHA/ASE/ASNC/SCAI/SCCT/STS 2017 Appropriate Use Criteria for Coronary Revascularization in Patients with Stable Ischemic Heart Disease. *Journal of the American College of Cardiology*, **69**, 2212-2241. https://doi.org/10.1016/j.jacc.2017.02.001

[4] Schmitt, R., Froehner, S., Brunn, J., Wagner, M., Brunner, H., Cherevatyy, O., *et al.* (2005) Congenital Anomalies of the Coronary Arteries: Imaging with Contrast-Enhanced, Multidetector Computed Tomography. *European Radiology*, **15**, 1110-1121. https://doi.org/10.1007/s00330-005-2707-z

[5] Kim, S.Y., Seo, J.B., Do, K., Heo, J., Lee, J.S., Song, J., *et al.* (2006) Coronary Artery Anomalies: Classification and ECG-Gated Multi-Detector Row CT Findings with Angiographic Correlation. *RadioGraphics*, **26**, 317-333. https://doi.org/10.1148/rg.262055068

[6] Kalangos, A., Khatchatourian, G., Baldovini, A., *et al.* (2000) Left Main Coronary Artery Occlusion Due to Dissection: A Rare Cause of Acute Ischemia. *The Annals of Thoracic Surgery*, **70**, 974-976.

[7] Brilakis, E.S., Mashayekhi, K., Tsuchikane, E., *et al.* (2021) Chronic Total Occlusions: A Guide to Revascularization. Springer.