SPONTANEOUS CORONARY ARTERY DISSECTION AND ANOMALOUS AORTIC ORIGIN OF A CORONARY ARTERY IN A PATIENT WITH END-STAGE RENAL DISEASE: A CASE REPORT AND LITERATURE REVIEW

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Abstract

Background: Spontaneous coronary artery dissection (SCAD) is an uncommon, non-atherosclerotic cause of acute coronary syndrome (ACS), most frequently affecting young women. Anomalous aortic origin of a coronary artery (AAOCA) is a rare congenital anomaly that may predispose individuals to exercise-induced myocardial ischemia and sudden cardiac death.

Case Summary: We report a 68-year-old woman with a history of diabetes mellitus, end-stage renal disease (ESRD), chronic hypertension, and congestive heart failure who presented with recurrent post-dialysis chest discomfort. Coronary angiography revealed SCAD in the proximal right coronary artery (RCA) with approximately 60% luminal narrowing and an anomalous origin of the left main coronary artery (LMCA) from the right coronary sinus (AAOCA). Given persistent symptoms and RCA dominance, the patient underwent PCI. Her postoperative course was uneventful, and she was discharged with outpatient follow-up.

Conclusion: The rare coexistence of SCAD and AAOCA highlights the importance of considering atypical coronary pathologies in patients with complex comorbidities and non-classical angina. Timely diagnosis and appropriate intervention may be crucial in improving patient outcomes.

Key Words: Spontaneous coronary artery dissection, anomalous coronary artery origin, unstable angina, end-stage renal disease, percutaneous coronary intervention

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Introduction

Spontaneous coronary artery dissection[1] (SCAD) is an under recognized cause of acute coronary syndrome(ACS), resulting from intimal tear or intramural hematoma formation, leading to true lumen compression.[4] Though primarily seen in younger women, it can occur in elderly patients with comorbidities. Anomalous aortic origin of a coronary artery (AAOCA) refers to a coronary artery arising from an inappropriate aortic sinus. Certain variants, particularly left main coronary artery(LMCA) originating from the right sinus with interarterial course, are associated with exercise-induced ischemia and sudden cardiac death.[2]

This report documents a rare case of SCAD coexisting with AAOCA in a hemodialysis-dependent elderly woman, presenting as unstable angina. The case underscores diagnostic and therapeutic challenges in such complex cardiovascular anomalies.

Literature Review

SCAD has gained recognition as a distinct pathological entity. Associations include fibromuscular dysplasia, hormonal status, and emotional or physical stress. Conservative treatment is favored in stable cases, but revascularization is indicated in hemodynamically compromised patients or high-risk lesions.

AAOCA occurs in approximately 0.1-1% of the population. The variant involving LMCA arising from the right sinus poses a higher risk, particularly if the artery follows an interarterial course.[2] The 2017 international consensus recommends intervention in symptomatic individuals or those with ischemia evidence.

The concomitant presence of SCAD and AAOCA is exceptionally rare. Literature mostly features younger patients without ESRD or significant comorbidities.

Case Report

A 68-year-old female with long-standing ESRD on maintenance hemodialysis, type 2 diabetes, hypertensive heart disease, and dyslipidemia reported worsening retrosternal chest discomfort after dialysis sessions for several months.

Cardiac catheterization showed SCAD in the proximal RCA with ~60% luminal narrowing. Incidentally, the LMCA was observed arising anomalously from the right coronary sinus, consistent with AAOCA. The RCA was the dominant vessel supplying the myocardium.

Given persistent ischemic symptoms and the critical role of the RCA, percutaneous transluminal coronary intervention (PCI) was performed with bare-metal stent deployment. Post-procedure recovery was uneventful. The patient was discharged on dual antiplatelet therapy and scheduled for outpatient follow-up.

Discussion

The coexistence of SCAD and AAOCA is extremely rare and scarcely reported. To our knowledge, this may represent one of the few documented cases involving an elderly dialysis-dependent patient with these concurrent anomalies. This case highlights the importance of a high index of suspicion and comprehensive imaging in atypical ACS presentations.[6]

Anomalous aortic origin of a coronary artery (AAOCA), especially the variant involving left main coronary artery (LMCA) arising from the right coronary sinus, is associated with an increased risk of myocardial ischemia and sudden cardiac death, especially during exertion. The interarterial course between the aorta and pulmonary artery

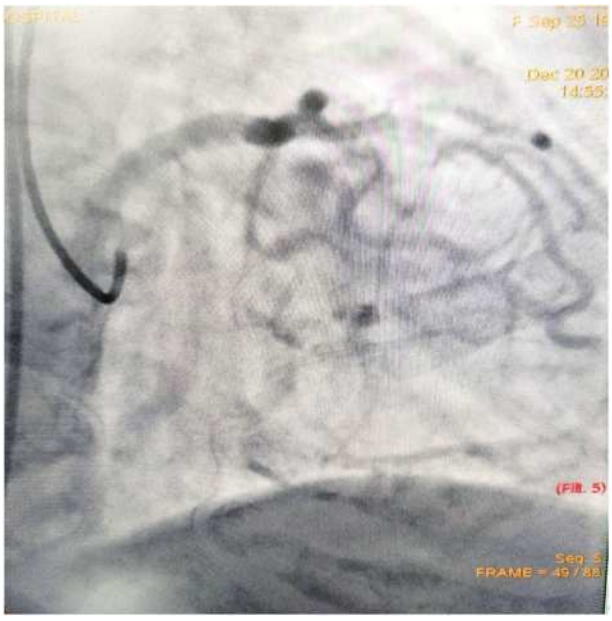

Fig. 1. Selective left coronary artery engagement with contrast injection showing anomalous origin of the left main coronary artery (LMCA) from the right coronary sinus.

Fig. 2. Left coronary angiography revealing anomalous origin of the left main coronary artery (LMCA) from the right coronary sinus, consistent with anomalous aortic origin of a coronary artery (AAOCA).

Fig. 3. Initial coronary angiography demonstrating spontaneous coronary artery dissection (SCAD) in the proximal right coronary artery with approximately 60% stenosis.

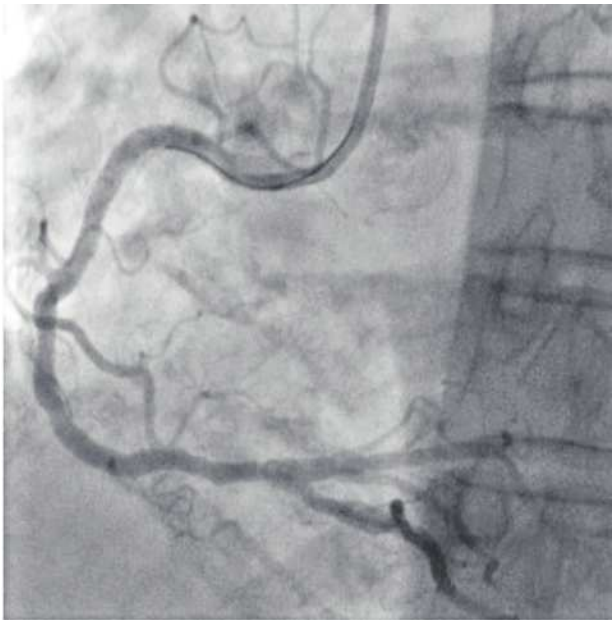

Fig. 4. Post-percutaneous coronary intervention (PCI) image showing restoration of normal coronary flow in the right coronary artery after stent implantation.

is of greatest concern.[2] Although AAOCA may be asymptomatic, current guidelines recommend intervention in symptomatic patients or those with ischemia documented on imaging. [3] In our case, the anomalous origin was incidentally discovered and not clearly related to symptoms, supporting a conservative approach with close follow-up.

Spontaneous coronary artery dissection[1] (SCAD) represents an increasingly recognized cause of acute coronary syndrome (ACS), distinct from atherosclerotic disease. Although it predominantly affects young, otherwise healthy females—often associated with fibromuscular dysplasia, hormonal fluctuations, or emotional stress—emerging evidence suggests that vascular fragility in elderly patients with chronic comorbidities such as end-stage renal disease (ESRD)[5] may also predispose to SCAD. In particular, repeated hemodialysis may exacerbate vascular shear stress and endothelial dysfunction,[7] potentially contributing to dissection events.

Conclusion

SCAD and AAOCA are rare, potentially life-threatening conditions that can mimic typical coronary artery disease presentations. In patients with multiple comorbidities presenting with atypical angina, rare coronary anomalies should be considered. Timely diagnosis and individualized treatment strategies, including revascularization when necessary, can improve patient outcomes.

Conflict of Interest

The authors declare no conflicts of interest.

In summary, this case underscores the diagnostic complexity and clinical implications of concomitant SCAD and AAOCA, particularly in patients with high-risk systemic conditions such as ESRD. Physicians should be aware that SCAD is not confined to young women, and AAOCA—though congenital—may be clinically silent until uncovered through angiography. Timely recognition and appropriate management strategies tailored to individual risk—such as revascularization in hemodynamically significant SCAD, and observation for non-symptomatic AAOCA—are crucial to optimize patient outcomes. Multimodality imaging and longitudinal follow-up are essential in guiding long-term care.

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同時合併自發性冠狀動脈剝離與異常冠狀動脈起源之末期腎病個案報告

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摘要

背景：自發性冠狀動脈剝離（SCAD）為一種罕見且非動脈粥樣硬化的急性冠心症（ACS）病因，常見於年輕女性。冠狀動脈異常起源（AAOCA）則為先天性心血管畸形，某些類型可能導致運動誘發性心肌缺血與猝死。

病例摘要：本報告描述一名 68 歲女性，具糖尿病、末期腎病變、慢性高血壓與鬱血性心衰竭病史，長期接受血液透析。近月來反覆於透析結束後出現胸悶不適，近兩週症狀加劇。冠狀動脈攝影顯示右冠狀動脈近端有疑似 SCAD 之剝離變化，造成約 60% 狹窄，另左主幹起源異常，自右冠狀竇發出（AAOCA）。考量右冠為優勢血管且症狀持續，遂施行經皮冠狀動脈介入治療（PCI），術後恢復良好，安排門診追蹤。

結論：SCAD 與 AAOCA 同時存在實屬罕見，臨床上對於具多重共病且症狀非典型之患者，應提高對冠狀動脈異常病因的警覺。早期診斷與適切介入有助於改善預後。

關鍵詞：自發性冠狀動脈剝離，冠狀動脈異常起源，不穩定型心絞痛，末期腎病變，經皮冠狀動脈介入治療

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