EXPLORING A RARE CORONARY ARTERY ANOMALY IN A PATIENT WITH ATYPICAL ANGINA: A DIAGNOSTIC CHALLENGE

Sana Tahir MD, Bret K. Farrow-Cypel DO, Sahil Mamtani MD, Inga Robbins MD, Partha Hota DO, Kenneth Khaw MD

AtlantiCare
REGIONAL MEDICAL CENTER

BACKGROUND

This case describes a rare left main coronary artery anomaly in a young female presenting with chest pain.

PRESENTATION AND HOSPITAL COURSE

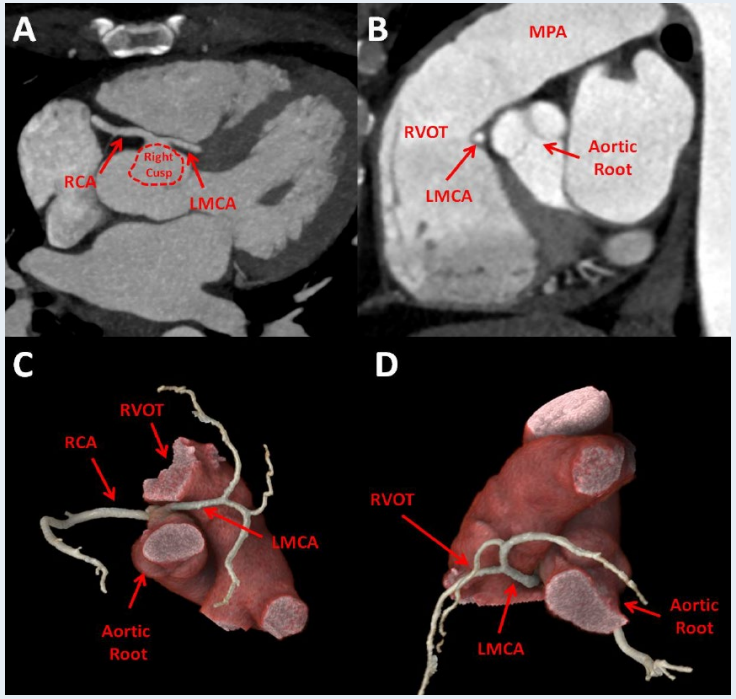
A 44-year-old female with a history of hypertension and type II diabetes mellitus presented with episodic, severe, band-like chest pain radiating to her back. Initially exercise-induced, over the past year the pain had progressed to occur at rest and awaken her from sleep, one to two times daily, lasting about 20 minutes. High sensitivity troponin T levels never exceeded 14 ng/L.

The patient had poor functional capacity on stress echocardiography. She underwent cardiac catheterization which revealed a right-dominant coronary system with the left main coronary artery (LMCA) originating anomalously from the right coronary cusp. No stenosis was seen with Rotational Coronary Angiography.

Subsequent, coronary CT angiography demonstrated the LMCA taking a low inter-arterial course between the aortic root and the right ventricular outflow tract (RVOT), without any high-risk features such as slit-like orifice, acute ostial angle, stenosis, or an intramural course.

A multidisciplinary discussion decided against intervention, and the patient is currently under medical management and close outpatient monitoring to evaluate for other non-cardiac causes of the chest pain.

CT ANGIOGRAPHY OF THE HEART



Axial (A) and sagittal (B) coronary CTA images as well as corresponding 3D rendered images (C and D) demonstrate an anomalous origin of the left main coronary artery (LMCA) which arises from the right coronary cusp and takes an inter-arterial course between the aortic root and right ventricular outflow tract (RVOT).

CONCLUSION

This case underlines the importance of a thorough diagnostic approach and the importance of imaging when evaluating coronary artery anomalies, which while clinically interesting, may not always be the cause of angina.

DISCUSSION

The anomalous origin of the LMCA from the right coronary cusp is considered extremely rare [2]. Traditionally, anomalous LMCA has been divided into four categories based on its anatomical relationship to the aorta and pulmonary trunk: inter-arterial, posterior, anterior, and septal courses [3]. The inter-arterial course has traditionally been described as malignant due to the association with sudden cardiac death, thought to be the result of transient compression of the LMCA between the aorta and pulmonary artery and subsequent vessel torsion [1]. However, the absence of several high-risk features (like slit-like orifice, acute ostial angle, stenosis, or intramural course) favors a benign prognosis.

In the mirror case of an anomalous origin of the RCA with an inter-arterial course, this is further classified as being “high” or “low”, depending on whether the coronary artery is positioned above or below the level of the pulmonary valve [1]. Cases of low inter-arterial course have been shown to have a lower risk for sudden cardiac death due to comparatively decreased narrowing of the RCA as a result of RVOT systolic contraction which counteracts aortic root systolic expansion [1]. While no literature that we know of specifically details this phenomenon for anomalous LMCA with low inter-arterial course, one could postulate that a similar reduction in compression likely occurs based on the anatomic relationship.

While an inter-arterial course of anomalous coronary arteries can be associated with ischemic symptoms, no such relation could be established in this case due to the lack of high-risk anatomic features.

REFERENCES

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