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## RESEARCH ARTICLE

### Interesting case of anomalous origin of right coronary artery from left sinus.

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#### Abstract

Anomalous coronary arteries (acas) are rare but potentially life-threatening abnormalities of coronary circulation. Most variations are benign; however, some may lead to myocardial ischemia and/or sudden cardiac arrest.<sup>1</sup> We present a case of 55-year-old male with a significant medical history of hypertension, hyperlipidemia, type 2 diabetes and gastroesophageal reflux disease who presented to the emergency department with atypical chest pain. He underwent a cardiac catheterization that showed coronary artery disease with tight lesions in both Left anterior descending and Left circumflex along with anomalous right coronary artery originating near the anterior left coronary artery sinus and coursing between the pulmonary artery and aorta. The patient was taken up for coronary artery bypass grafting of LAD and LCX only, leaving behind RCA and was discharged home after full recovery. Treatment of significant anomalies should be guided by the nature of the anomalous vessel. Symptomatic patients with acas have 3 treatment options: medical management, coronary angioplasty and stent deployment, or surgical correction. Some clinicians advocate revascularization, but the long-term benefits of revascularization therapies have not yet been demonstrated.

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#### Case report:-

A 55-year-old male with a significant medical history of hypertension, hyperlipidemia, type 2 diabetes and gastroesophageal reflux disease presented to the emergency department with atypical cardiac chest pain. He complained of intermittent chest discomfort that had persisted for 2 months. He described the pain as 7 of 10 in severity, substernal, lasting less than 5 minutes, resolving spontaneously but becoming acutely worse with minimal exertion. His electrocardiogram (EKG) on presentation showed normal sinus rhythm with ST and T wave abnormalities potentially indicating anterior and inferior ischemia seen in III, avf, and V1-V3. His 2D echocardiogram 2 months prior to admission had shown a normal ejection fraction (60%) with normal diastolic function. He was admitted to cardiology for unstable angina and underwent a cardiac catheterization that showed tight lesions in both Left anterior descending and Left circumflex along with an anomalous RCA originating near the anterior left coronary artery sinus and coursing between the pulmonary artery and aorta. The patient was taken up for coronary artery bypass grafting and after complete recovery was discharged home.

#### Discussion:-

Anomalies of coronary circulation result from processes that disrupt the normal differentiation and specialization of the primitive heart tube.<sup>2</sup> Position of the endothelial buds or septation of the truncus arteriosus may give rise to anomalous origins of coronary arteries.<sup>3</sup> Few anomalies present with symptoms or serious clinical sequelae that require surgical correction; most are discovered incidentally during angiography. White and Edwards first described the anomalous origin of the RCA as a rare congenital abnormality in 1948.<sup>4</sup>

Anomalous rcas that originate from the left coronary sinus occur in 0.05%-0.1% of the general population.<sup>5</sup> Although acas occur with low frequency, a high risk of sudden cardiac death because of myocardial ischemia and resultant arrhythmia are associated with them, even in the absence of atherosclerosis.<sup>6</sup> Multislice

computed tomography (CT) can clearly delineate the anatomy (Fig.1 to Fig. 3) and have replaced angiography as definitive diagnostic tools.<sup>7</sup> Multislice CT has been recommended because it offers excellent spatial resolution and identifies most coronary anomalies<sup>8</sup> the use of cardiac MRI for studying congenital anomalies has generated great interest among cardiologists; however, current studies are insufficient to recommend MRI as the imaging method of choice for acas.

Treatment of significant anomalies should be guided by the nature of the anomalous vessel. Treatment options remains controversial, with some clinicians advocating revascularization. Symptomatic patients with acas have 3 treatment options: medical management, coronary angioplasty and stent deployment, or surgical correction. Stenting generally is not recommended. Several surgical options are available, including directly reimplanting the anomalous artery, surgically unroofing the intramural coronary segment from the ostium to the exit point at the aortic wall, or creating a new ostium at the end of the anomalous artery's segment, a procedure known as osteoplasty. Revascularization using direct reimplantation of the anomalous RCA into the right coronary sinus is the preferred method of surgical treatment for this abnormality per the surgical literature.<sup>9</sup> Current literature does not demonstrate any long-term benefits of revascularization.

The Japanese approach to this condition is far more conservative, as demonstrated by a study of 56 patients who had anomalous arteries and were treated medically with beta blockers. Side effects of the conservative approach included hypotension and arrhythmias on exertion (9%).<sup>10</sup>

Coronary artery bypass grafting of LAD, LCX was effective in our patient.

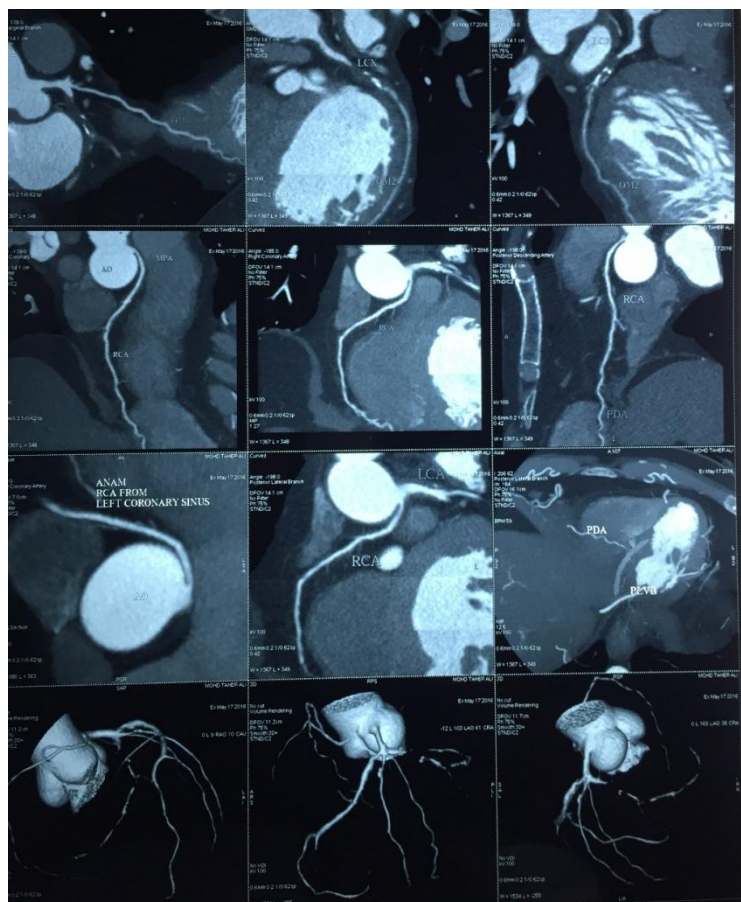


Fig. 1

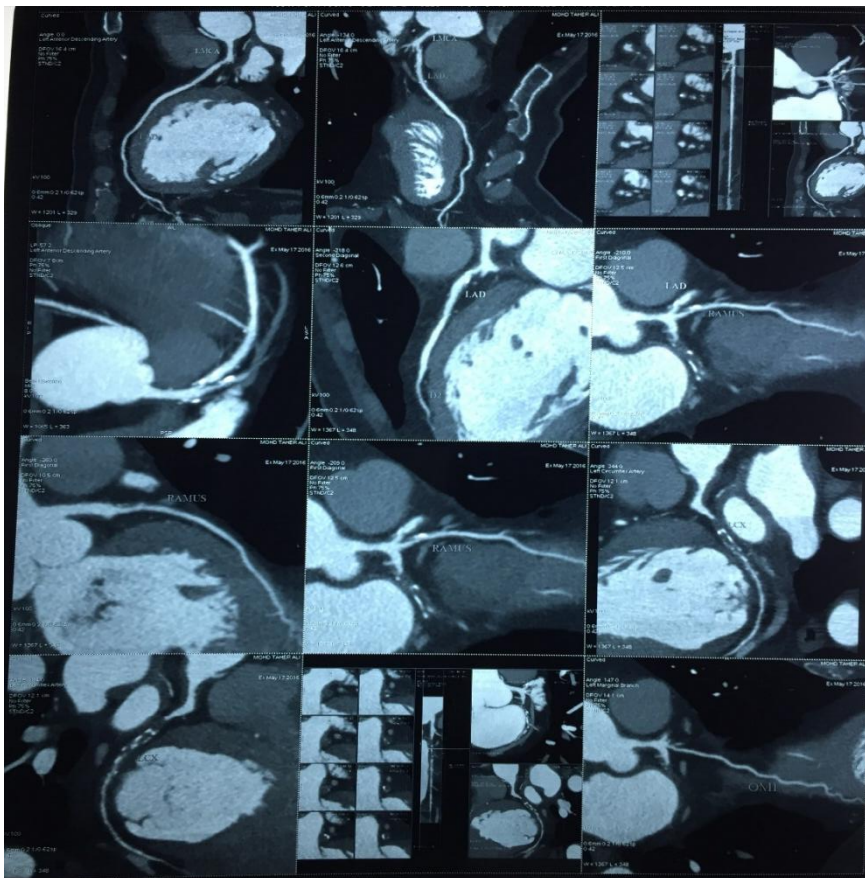


Fig. 2

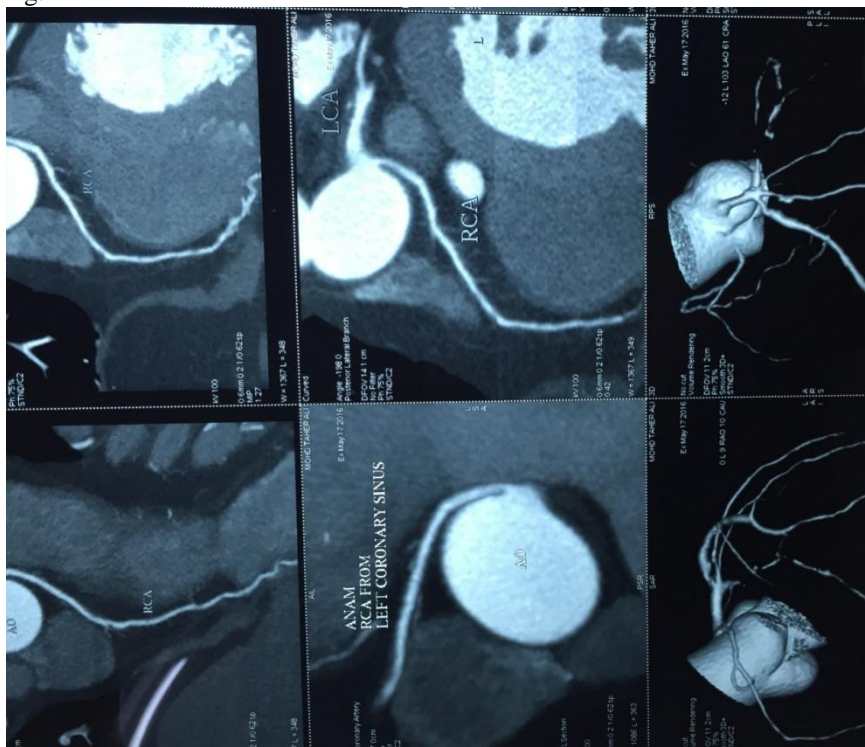


Fig. 3

**Conclusion:-**

This case illustrates an example of an anomalous RCA originating from the left coronary sinus in a middle-aged patient with coronary artery disease. The preferred treatment for these patients is conservative medical therapy for RCA after bypass grafting of LAD and LCX.

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