Anomalous origin of left circumflex coronary artery: An easy 'pick' on transthoracic echocardiography

Keyur Vora, Alok Ranjan

ABSTRACT

Abstract is not required for Clinical Images

International Journal of Case Reports and Images (IJCRI)

International Journal of Case Reports and Images (IJCRI) is an international, peer reviewed, monthly, open access, online journal, publishing high-quality, articles in all areas of basic medical sciences and clinical specialties.

Aim of IJCRI is to encourage the publication of new information by providing a platform for reporting of unique, unusual and rare cases which enhance understanding of disease process, its diagnosis, management and clinico-pathologic correlations.

IJCRI publishes Review Articles, Case Series, Case Reports, Case in Images, Clinical Images and Letters to Editor.

Website: www.ijcasereportsandimages.com

Anomalous origin of left circumflex coronary artery: An easy ‘pick’ on transthoracic echocardiography

Keyur Vora, Alok Ranjan

CASE REPORT

A 52-year-old male with a personal history of smoking and systemic arterial hypertension since two years presented with what he described as a squeezing pain in the left side of his chest. He also had associated dizziness and diaphoresis. An initial electrocardiogram (ECG) revealed acute inferior wall infarction with sinus bradycardia. As per the institutional protocol, a transthoracic echocardiography was performed prior to coronary angiography. Transthoracic 2D-echocardiography was consistent with inferior wall myocardial infarction and no significant mitral regurgitation.

Remarkably, in apical five-chamber view, a prominent vessel was seen; arising from right side of aortic root; entering into left atrioventricular (AV) groove (Figure 1 A–B; blue arrows). Part of this vessel was also apparent in apical two chamber view and in parasternal long axis views (Figure C; red dotted lines, red arrow and D; green arrow). An anomalous origin of coronary artery was diagnosed. The course of the vessel towards left AV groove was suggestive of left circumflex coronary artery (LCX). In parasternal short axis (PSAX) view, left main coronary artery (Figure E; orange arrow) and right coronary artery (Figure E; yellow arrow) were arising from their respective sinuses. The origin of the anomalous LCX was not seen in PSAX view. Finally, the anomalous LCX was confirmed on coronary angiography (CAG), arising from ostioproximal part of right coronary artery (Figure F; white arrow).

Figure 1: (A) Anomalous coronary artery on echocardiography. In apical four-chamber view, a coronary artery is found arising from right side of aortic root, (blue arrow), (B) Anomalous coronary artery on echocardiography. In apical five-chamber view, a coronary artery is found arising from right side of aortic root, entering into left atrioventricular groove (blue arrow), (C) Course of anomalous coronary artery. The part of the anomalous course of coronary artery was also depicted on parasternal long axis (PLAX) view (red dotted lines), (D) Course of anomalous coronary artery. The part of the anomalous course of coronary artery was also depicted on apical two-chamber view (green arrow), (E) Origin of coronary arteries. Left main coronary artery (LMCA) is arising from left coronary sinus as shown on parasternal short axis view (orange arrow), RCA is arising from right coronary sinus as shown on parasternal short axis view (yellow arrow), and (F) Anomalous artery on coronary angiogram. Anomalous origin of left circumflex coronary artery is depicted on conventional coronary angiogram (white arrow).

Keyur Vora¹, Alok Ranjan¹

Affiliations: ¹Department of Cardiology, CARE Hospitals, the Institute of Medical Sciences, Surat, Gujarat, India.

Corresponding Author: Keyur Vora, Department of Cardiology, CARE Hospitals, the Institute of Medical Sciences, Surat, Gujarat 395009, India; Email: drkeyurvora@gmail.com

Received: 28 September 2016

Accepted: 21 October 2016

Published: 01 February 2017

DISCUSSION

Anomalous origin of LCX from right coronary sinus is the most common congenital variant with prevalence of 0.18–0.67% [1]. An aberrant but normal LCX arising from the right coronary sinus (common or separate ostium with the RCA) has no clinical significance per se, and it does not predispose the LCX to a higher incidence of obstructive disease [2]. Although the LCX anomaly

is classified as benign and asymptomatic, it can cause myocardial ischemia, and in some cases sudden death, myocardial infarction, and angina pectoris in the absence of atherosclerotic lesions. These manifestations might be due to repeated compression of the anomalous artery by a dilated aortic root or to unusual angling as a result of the retroaortic course of the LCX, which can compress the coronary ostium and restrict blood flow.

On the other hand, the presence of obstructive disease, however, especially in a vessel of large distribution, makes it mandatory that the anomaly be recognized and angiographically demonstrated, especially in acute myocardial infarction. Sometimes, in acute myocardial infarction, no evidence of an occluded coronary artery can be seen during angiography. This might lead to a large spectrum of differential diagnoses to explain the acute chest pain or the electrocardiogram modification [3]. The absence of an epicardial vessel or its branch, which is anatomically supposed to supply a myocardial ischemic area identified at the left ventriculography, suggests that an anatomical variation of the normal coronary tree (i.e. the aberrant artery) has to be actively searched.

Computed tomography angiography (CTA) is more useful than conventional angiography. Three dimensional information of the course of the coronary arteries in relationship to the great vessels and the origin are clearly detected by CTA. The transthoracic echocardiography is most limited in such cases as it can only detect part of the anomalous course of the artery. Usually, the origins of coronary arteries from its respective coronary sinuses are relatively easy to detect on transesophageal echocardiography. The subsequent course of artery is even more difficult and most of the times only a proximal part of the course is detected on TTE. The distal course and intramural course of the artery are not seen on TTE. The role of TTE is even more limited in adult as compared to children in detecting coronary abnormalities.

Transesophageal echocardiography may be more useful in detecting the origin and the proximal part of coronary arteries but the subsequent course is even more difficult to detect. Transesophageal echocardiography offers several advantages that may potentially overcome the technical problems associated with the transthoracic approach, including closer proximity of the transducer to the proximal coronary arteries and avoidance of anterior chest wall structures that cause degradation of the ultrasonic signal. This allows the routine use of higher frequency transducers and thus better spatial resolution and more detailed image quality. With these advantages, TEE is only helpful in detecting proximal coronary abnormalities [4].

CONCLUSION

In conclusion, our imaging experience highlights the significance of evaluation of coronary arteries on emergency echocardiography study and

proactive preparation for uneventful interventional procedures. Careful evaluation of coronary arteries on echocardiography is inexpensive, quick and time saving modality as well as contrast and radiation exposure is saved. Such a high level of anticipation can be extremely useful information for emergency percutaneous coronary interventions (PCI). The reliable anticipation and identification is of paramount importance to the interventional cardiologists. Appropriate anatomical and technical understanding is vital for a successful interventional treatment of anomalous coronary arteries.

Keywords: Anomalous Coronary Artery, Acute Coronary Syndrome, Transthoracic Echocardiography

How to cite this article

Vora K, Ranjan A. Anomalous origin of left circumflex coronary artery: An easy 'pick' on transthoracic echocardiography. Int J Case Rep Images 2017;8(2):155–157.

Article ID: Z01201702CL10114KV

doi:10.5348/ijcri-201704-CL-10114

Author Contributions

Keyur Vora – Substantial contributions to conception and design, Acquisition of data, Analysis and interpretation of data, Drafting of article, Revising it critically for important intellectual content, Final approval of the version to be published

Alok Ranjan – Substantial contributions to conception and design, Acquisition of data, Analysis and interpretation of data, Drafting of article, Revising it critically for important intellectual content, Final approval of the version to be published

Guarantor

The corresponding author is the guarantor of submission.

Conflict of Interest

Authors declare no conflict of interest.

Copyright

© 2017 Keyur Vora et al. This article is distributed under the terms of Creative Commons Attribution License which permits unrestricted use, distribution and reproduction in any medium provided the original author(s) and original

publisher are properly credited. Please see the copyright policy on the journal website for more information.

REFERENCES

1. Dursunoglu D, Ozalp G, Tasköylü O, Semiz E. Anomalous origin of the left circumflex coronary artery: A case report. *Exp Clin Cardiol* 2007 Winter;12(4):207–8.
2. Page HL Jr, Engel HJ, Campbell WB, Thomas CS Jr. Anomalous origin of the left circumflex coronary artery: Recognition, angiographic demonstration and clinical significance. *Circulation* 1974 Oct;50(4):768–73.
3. Hendiri T, Alibegovic J, Bonvini RF, Camenzind E. Successful angioplasty of an occluded aberrant coronary artery: A rare cause of acute myocardial infarction. *Acute Card Care* 2006;8(2):125–7.
4. Samdarshi TE, Nanda NC, Gatewood RP Jr, et al. Usefulness and limitations of transesophageal echocardiography in the assessment of proximal coronary artery stenosis. *J Am Coll Cardiol* 1992 Mar 1;19(3):572–80.

ABOUT THE AUTHORS

Article citation: Vora K, Ranjan A. Anomalous origin of left circumflex coronary artery: An easy ‘pick’ on transthoracic echocardiography. *Int J Case Rep Images* 2017;8(2):155–157.

Keyur P. Vora is an Internist and Imaging Cardiologist at CARE Institute of Medical Sciences, India. He holds MS Bioinformatics degree from Georgia State University, Atlanta as well as Postdoctoral Research Fellowship from Emory University/CDC, Atlanta USA. His research interests include echocardiography, Cardiac CT, Cardiac MR studies and computational medicine projects.
E-mail: drkeyurvora@gmail.com

Alok Ranjan, Department of Cardiology, CARE Hospitals, the Institute of Medical Sciences, Surat, Gujarat, India.

Access full text article on
other devices

Access PDF of article on
other devices

Edorium Journals: An introduction

Edorium Journals Team

About Edorium Journals

Edorium Journals is a publisher of high-quality, open access, international scholarly journals covering subjects in basic sciences and clinical specialties and subspecialties.

Invitation for article submission

We sincerely invite you to submit your valuable research for publication to Edorium Journals.

But why should you publish with Edorium Journals?

In less than 10 words - we give you what no one does.

Vision of being the best

We have the vision of making our journals the best and the most authoritative journals in their respective specialties. We are working towards this goal every day of every week of every month of every year.

Exceptional services

We care for you, your work and your time. Our efficient, personalized and courteous services are a testimony to this.

Editorial Review

All manuscripts submitted to Edorium Journals undergo pre-processing review, first editorial review, peer review, second editorial review and finally third editorial review.

Peer Review

All manuscripts submitted to Edorium Journals undergo anonymous, double-blind, external peer review.

Early View version

Early View version of your manuscript will be published in the journal within 72 hours of final acceptance.

Manuscript status

From submission to publication of your article you will get regular updates (minimum six times) about status of your manuscripts directly in your email.

Our Commitment

Six weeks

You will get first decision on your manuscript within six weeks (42 days) of submission. If we fail to honor this by even one day, we will publish your manuscript free of charge.*

Four weeks

After we receive page proofs, your manuscript will be published in the journal within four weeks (31 days). If we fail to honor this by even one day, we will publish your manuscript free of charge and refund you the full article publication charges you paid for your manuscript.*

Favored Author program

One email is all it takes to become our favored author. You will not only get fee waivers but also get information and insights about scholarly publishing.

Institutional Membership program

Join our Institutional Memberships program and help scholars from your institute make their research accessible to all and save thousands of dollars in fees make their research accessible to all.

Our presence

We have some of the best designed publication formats. Our websites are very user friendly and enable you to do your work very easily with no hassle.

Something more...

We request you to have a look at our website to know more about us and our services.

* Terms and condition apply. Please see Edorium Journals website for more information.

We welcome you to interact with us, share with us, join us and of course publish with us.

Edorium Journals: On Web

Browse Journals

CONNECT WITH US