

From tricuspid valve infective endocarditis to acute limb ischemia: A case report.

66

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Type of submitter

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Abstract

Introduction:

Atrial septal defect (ASD) is a common form of congenital heart disease (CHD) accounting for one third of CHD cases. Most patients with ASD remain asymptomatic, however complications including pulmonary hypertension and arrhythmia can occur. Tricuspid valve infective endocarditis paradoxical septic embolism is a rare complication of ASD.

Case Report:

A 39-year-old female who is an active IV drug user presented to an outside hospital with complaints of fever, chills, shortness of breath, nausea, diarrhea and severe pain in both lower extremities for 4 days. The patient was found to be hypotensive and received fluid resuscitation and then was referred to our hospital for intensive care admission. On presentation the patient was found to be hypotensive, tachycardic and febrile. ECG revealed sinus tachycardia. Upon physical examination the patient was found to have cold lower extremities and blue/yellow coloring of both feet. Laboratory evaluation showed lactic acidosis, WBC 5.7 with 86% segmented neutrophils, platelets 29, and potassium 3.3. Urine drug screen was positive for opiates and fentanyl. Central venous access was obtained and treatment with fluids, cardizem and broad-spectrum antibiotics was initiated. CT of the chest with IV contrast revealed numerous ill-defined pulmonary nodules and cavitation's consistent with septic emboli. CT angiography of the lower extremities showed distal occlusion of bilateral anterior tibial, posterior tibial and peroneal arteries. A transthoracic echocardiogram was obtained and revealed a large tricuspid valve vegetation measuring 1x1 cm with mobile fragments, mild tricuspid valve regurgitation and a positive bubble study. Blood cultures grew MRSA and Streptococcus agalactiae. Patient was evaluated by vascular surgery who recommended bilateral below the knee amputation however due to the patient's critical condition, she was not a candidate for surgery and eventually expired.

Discussion:

Right-sided IE is a rare type of IE making up only 5-10% of cases and is associated strongly with IVDU. The most common organism identified is staphylococcal aureus accounting for 60-90% of cases, however methicillin resistant staphylococcal aureus (MRSA) rates are increasing in addition to polymicrobial infections as seen in this case. Tricuspid valve involvement is most commonly seen, and the mortality rate is approximately 7%. If systemic emboli are present, then one should consider the presence of left-sided IE or paradoxical emboli. As right sided pressures increase and tricuspid regurgitation worsens, tricuspid valve infective endocarditis can result in a paradoxical septic emboli through the ASD. Imaging with an echocardiogram should be performed in all cases of infective endocarditis and most ASD can be detected with either transesophageal or transthoracic echocardiogram with bubble study. The risk of paradoxical septic emboli can be reduced by surgically closing the ASD or removing the vegetation, however this would be performed on a non-optimized patient which carries major risk in itself.

Conclusion:

Paradoxical septic emboli can occur in patients with right-sided infective endocarditis through a congenital defect in the septum. Proper imaging is important to ascertain the presence of the congenital defect with intervention such vegetation aspiration or ASD closer considered to reduce the patient's risk.

Categories

1st year Fellow: Case

Program/Institution Name

University of Cincinnati

A rare case of triple vessel Spontaneous Coronary Artery Dissection

68

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Abstract

A Rare Case of Triple Vessel Spontaneous Coronary Artery Dissection

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Abstract;

Introduction/Objective: Spontaneous coronary artery dissection (SCAD) is an infrequent overall cause for ACS and the vast majority of reported cases are limited to a single vessel (84%) or two vessels (15%). We report the rare case of a young female patient with triple vessel SCAD.

Case Presentation: 22 y/o woman, 2 weeks postpartum after her 4th pregnancy presented to emergency room with anginal chest pain. She did not have any known risk factors for atherosclerotic coronary artery disease. EKG showed ST depressions in inferior & lateral leads and troponin was elevated to peak value of 4.932 (Normal Troponin I <0.040 ng/ml). Echocardiogram was consistent with mild decrease in LVEF (50%) without any focal wall motion abnormalities. Her coronary angiography revealed triple vessel SCAD involving distal LM extending to mid LAD, LCX and distal RCA. Further workup with CTA of the head/neck/abdomen revealed diffuse irregularity of vertebral arteries and intra cranial arteries, irregular caliber & focal wall thickening of common iliac arteries, and ectasia of the infrarenal abdominal aorta consistent with the diagnosis of Fibromuscular dysplasia (FMD). She was hemodynamically stable throughout, was managed conservatively with heparin during hospitalization, and was discharged home after 10 days on aspirin, plavix, metoprolol and captopril.

Discussion: Postpartum SCAD is a known cause of ACS in young females and SCAD has been reported to be a cardiac manifestation in patients with FMD. But majority of SCAD reported in literature is limited to a single vessel disease. Two vessel involvements are thought to be quite rare, and multivessel involvement even rarer. Due to the limited number of cases, there is limited prognostic data, and no standardized treatment plan. The case reported here highlights that multivessel extensive SCAD is possible, and that in young patients without significant risk factors for coronary disease, the clinical strategy might warrant

a high clinical suspicion of SCAD, early invasive angiography, and noninvasive imaging to evaluate for FMD.

Conclusion: Multivessel SCAD can occur, especially in FMD patients who are postpartum. Prospective and retrospective studies are needed to optimized treatment strategies and prognosis of these patients.

Cath Images;

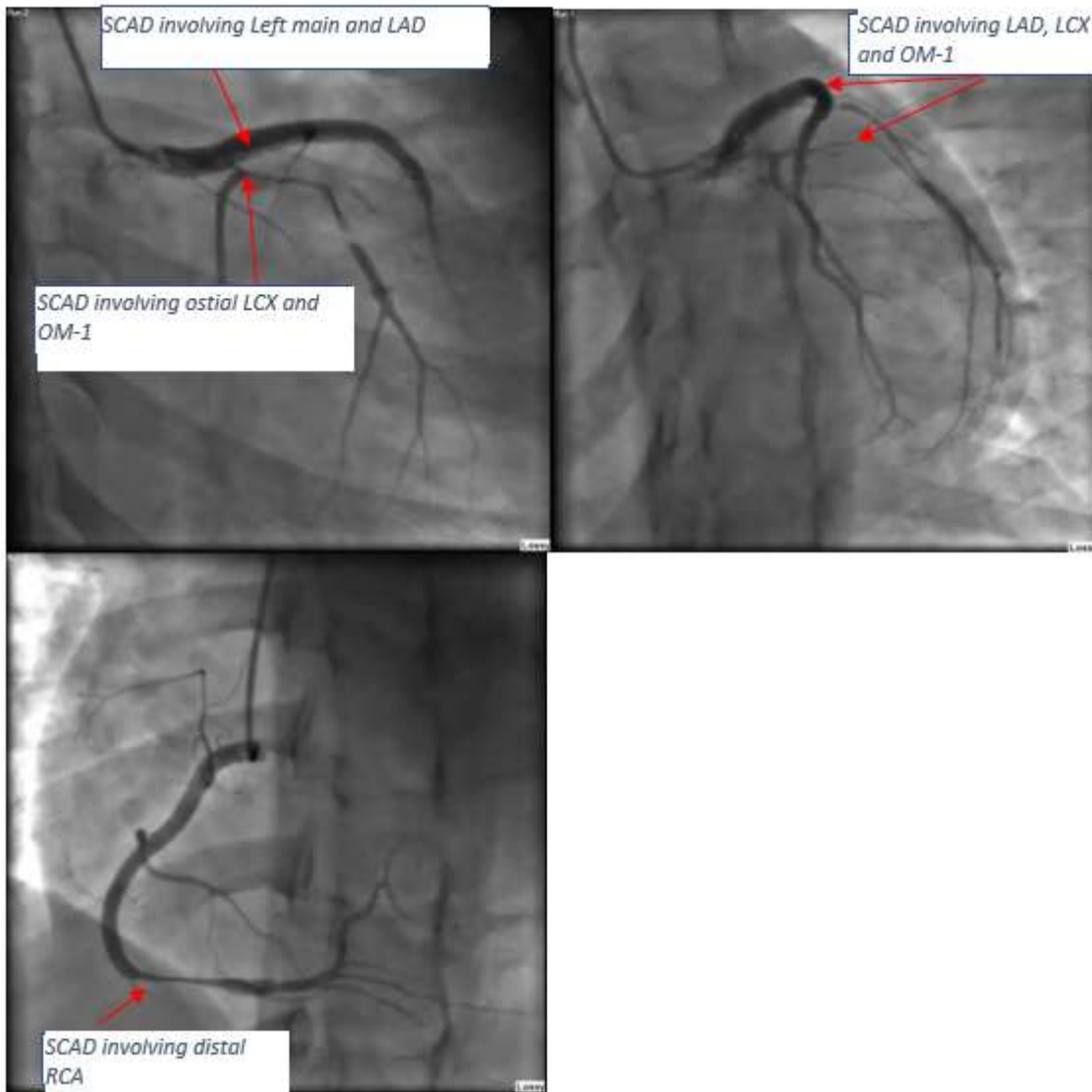


Figure 1: Coronary Angiograms

Categories

1st year Fellow: Case

Program/Institution Name

CWRU MetroHealth

ST Elevation Myocardial Infarction Resulting From Coronary Embolism as a Complication of Non-Valvular Atrial Fibrillation

44

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Abstract

Introduction

Acute myocardial infarctions develop primarily from atheromas with coronary emboli being an underappreciated cause of nonatherosclerotic acute coronary syndrome. Commonly, systemic emboli are a result of non-valvular atrial fibrillation. We present a patient with ST elevation myocardial infarction due to coronary emboli secondary to non-valvular atrial fibrillation. Following aspiration thrombectomy, restoration of coronary blood flow was achieved.

Case presentation

A 56-year-old Caucasian male with history of hypertension and tobacco abuse presented to the emergency department with sudden onset of chest pain. Physical examination revealed irregularly irregular rhythm without an audible murmur on cardiac auscultation. A 12-lead EKG demonstrated atrial fibrillation with diffuse ST segment elevation throughout. Initial troponin were > 40 ng/dl (normal values < 0.040 ng/dl). He subsequently underwent emergent cardiac catheterization. Coronary angiography revealed multiple areas of thrombus including the distal left anterior descending artery, distal left circumflex, and obtuse marginal branch, which was the culprit vessel. There was a discrete, 100% thrombosis in the mid vessel with an otherwise visually smooth contour. Aspiration thrombectomy was performed with retrieval of red thrombus. There was no residual stenosis with TIMI grade 0 flow shown in Figure 1. Further diagnostic evaluation with transthoracic and transesophageal echocardiography showed no evidence of atrial thrombi, vegetations, structural valvular abnormalities, patent foramen ovale or septal defects. Hypercoagulable workup was negative. Followup angiography at 1 year showed normal coronary anatomy.

Discussion

Nonvalvular atrial fibrillation is a common cause of coronary emboli. Limited data shows association of atrial fibrillation and risk factors for acute myocardial infarction. Acute coronary embolism is not a well-documented adverse outcome of atrial fibrillation. Successful coronary reperfusion can be achieved with aspiration thrombectomy. Distal embolization of thrombus during balloon inflation or stent

deployment carries an increased risk of poor clinical outcomes. Smaller trials, particularly the TAPAS study demonstrated that aspiration thrombectomy alone is feasible in achieving reperfusion and resolution of ST elevation myocardial infarction as opposed to conventional PCI. However, the TASTE trial revealed that there was no mortality benefit at 1 year following routine thrombectomy. The TOTAL trial showed that PCI with thrombectomy versus PCI alone does not reduce the risk of cardiovascular death, cardiogenic shock or recurrent myocardial infarction at 180 days and may lead to an increased risk of stroke within the first 30 days. Intracoronary ultrasound and optical coherence tomography can be performed to exclude erosion. These modalities were not performed during the case, as they were considered restrictive, given the presence of multiple territorial infarcts visualized angiographically. As well, recognition of appropriate risk factor stratification in reference to CHADS₂-VAsC scoring for prevention of systemic thromboembolism remains extremely important for prevention of embolic phenomenon in this population of patients.

Conclusion

ST elevation myocardial infarction as a consequence of coronary embolism from atrial fibrillation is an underappreciated cause of ACS and should be suspected in situations of high thrombus burden in the setting of otherwise normal coronary anatomy on angiography. Aspiration thrombectomy alone without conventional PCI may be a viable and effective treatment option for these individuals.

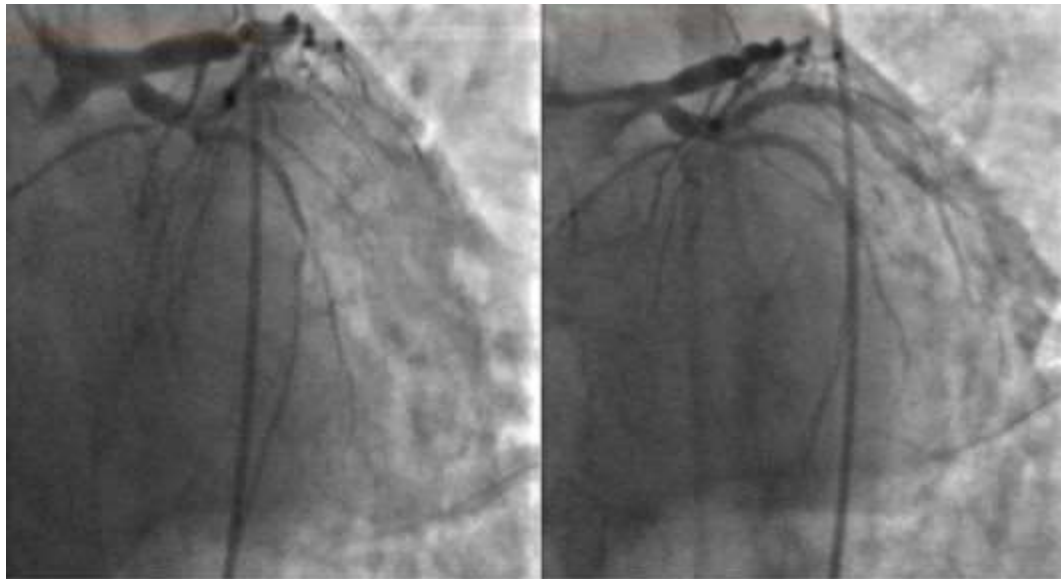


Figure 1: Coronary angiography demonstrating a 100% thrombotic occlusion of OM1 on the left with restoration of flow following aspiration thrombectomy shown on the right.

Categories

1st year Fellow: Case

Program/Institution Name

Canton Medical Education Foundation/Aultman Hospital/NEOMED

STEMI in a Patient with a Single Coronary Artery

30

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Summa Health

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Abstract

Introduction

Coronary artery anomalies are estimated to be found in 0.3% - 1.0% of healthy individuals. Approximately 20 variations of coronary anomalies have been described. Common anomalies are either multiple ostia or the origin of an artery from a different sinus. However, a single coronary artery supplying the entire myocardium is an extremely rare finding with an incidence of 0.0024% - 0.044%. This case describes a STEMI in a single coronary artery originating from the Left Sinus of Valsalva with a dominant left circumflex artery giving rise to the right coronary artery without a right aorto-coronary ostium.

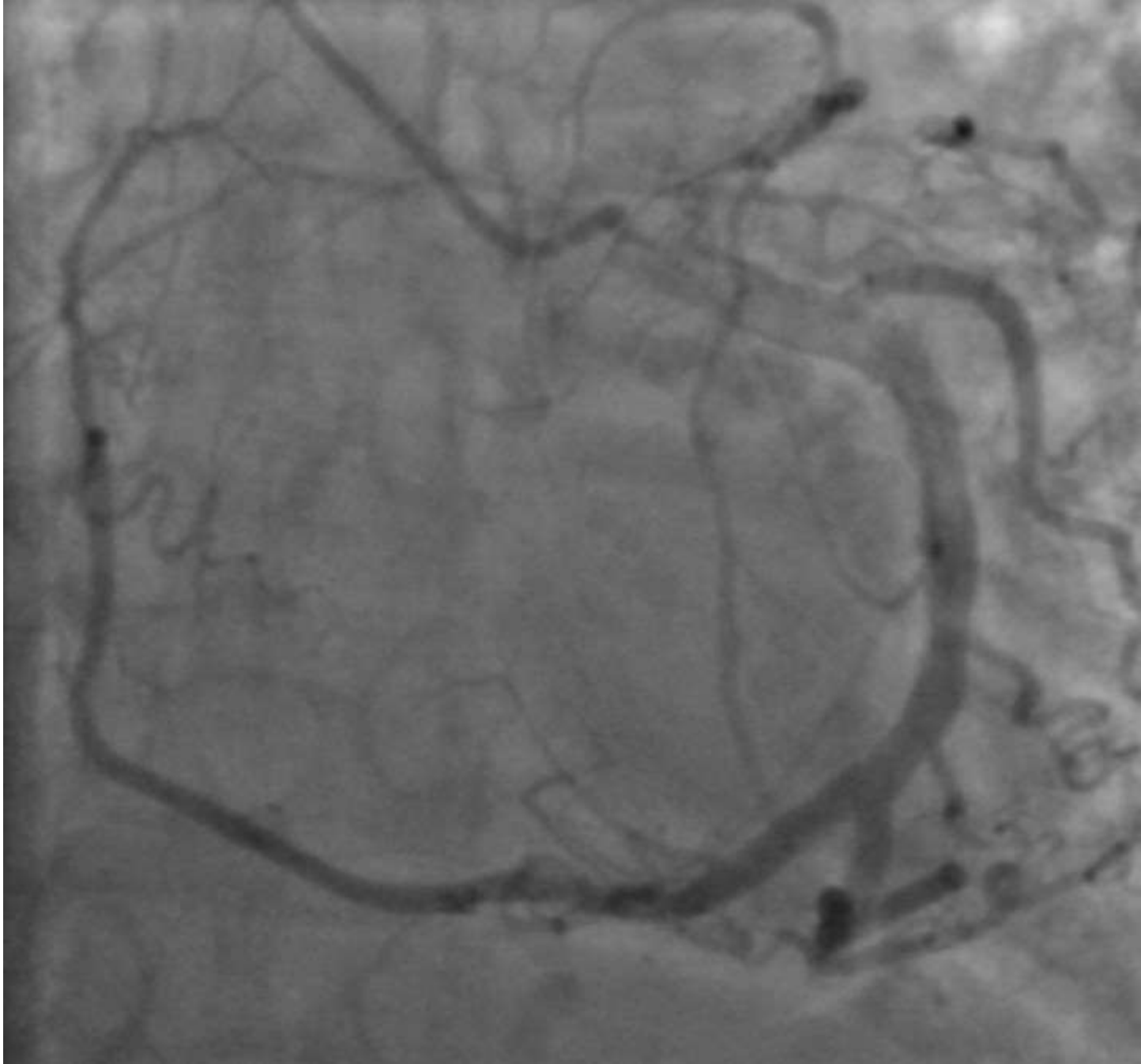
Case

An 86-year-old woman with a history of essential hypertension and hyperlipidemia presented to an outside hospital emergency department (ED) with acute intermittent non-exertional chest discomfort. Her medications included aspirin 81mg daily and diltiazem 240mg ER daily. She never smoked and had no family history of cardiac disease. In the ED, her electrocardiogram demonstrated ST elevations in leads V2-V3. Laboratory troponin was 2.9 ng/ml. She continued to have symptoms and was transferred to a percutaneous coronary intervention (PCI) capable hospital center. In the catheterization laboratory, attempts to engage the right coronary artery were unsuccessful. The left main coronary artery was then engaged in the left coronary cusp. Angiography revealed a left main coronary artery that bifurcated normally into the left anterior descending artery (LAD) and dominant left circumflex artery (LCX). The LCX was very large and continued around the AV groove anteriorly to give rise to the right coronary artery (RCA) which gave off an acute right ventricular marginal branch. The culprit lesion was an ostial 99% stenosis of the LAD. The lesion was stented and had excellent angiographic appearance with TIMI grade 3 flow. Left ventriculogram showed an ejection fraction of 45-50%.

Discussion

Congenital absence of a coronary ostium resulting in a single coronary artery is an extremely rare finding. A single coronary artery can be compatible with normal life expectancy. However, younger

patients are at increased risk of sudden death if the coronary crosses between the pulmonary artery and aorta. Older patients are at increased risk of sudden death if an acute proximal stenosis develops in the artery that supplies the dominant portion of the myocardium. Coronary anomalies are described according to the Lipton classification. This patient would classify as an L-IIA. L -Sinus of Left Valsava, II - single coronary artery crossing the heart as a large transverse trunk and supplying the contralateral coronary artery, and A – course of artery is anterior to the aorta and pulmonary artery. This case highlights the extremely rare finding of a single coronary artery presenting as an acute STEMI.



Right Anterior Oblique - Caudal view. Single Coronary Artery : Large Dominant Left Circumflex Artery (right) giving rise to the Right Coronary Artery (left). Left Anterior Descending Artery not well visualized in this image.

Categories

1st year Fellow: Case

Program/Institution Name

Summa Health System/NEOMED

In-Situ Coronary Thrombosis Associated with Hydroxycut

51

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Type of submitter

Fellow in Training

Abstract

Intro

With the rise of obesity followed the rise of unregulated over-the-counter diet aids. Due to concerning adverse events (i.e. seizure, myocardial infarction, stroke, hepatotoxicity), Hydroxycut underwent numerous recalls and reformulations in an effort to stay in market. In spite of that, numerous adverse events are still being reported such as atrial fibrillation, atrial and ventricular arrhythmias, and asystole.

Case Report

Here, we chronicle a case of an otherwise healthy 37 year-old man who presented with persistent typical angina and was diagnosed with non-ST elevation myocardial infarction. A left heart catheterization showed total occlusions in the left circumflex and 2nd obtuse marginal arteries. Thrombectomy was performed on the circumflex lesion and thrombectomy/PTCA was performed on the ostial 2nd obtuse marginal lesion. While the patient did have risk factors (hyperlipidemia, elevated BMI), his coronary disease appeared to be non-atherogenic with concern for in-situ coronary thrombosis. We suspected this to be secondary to his use of Hydroxycut Black, a dietary supplement that he began taking for the previous couple of months. An echocardiogram showed a left ventricular ejection fraction of 55-60% with normal diastolic function. Secondary etiologies were investigated for in-situ coronary thrombosis; markers for a hypercoagulable state (DRVVT, factor & leiden, anticardiolipin antibody, beta-2-glycoprotein) were absent. A lower extremity venous duplex and a CT with contrast of the chest, abdomen, and pelvis did not reveal any evidence of vascular thrombosis or thromboembolism. He was initiated on clopidogrel and apixaban and was discharged.

Discussion

There are no reports of in-situ coronary thrombosis potentially induced by Hydroxycut under its new formulation that's reportedly devoid of sympathomimetic amines (i.e. ephedra). Yohimbe extract (6% yohimbine) and caffeine (200 mg) are of particular concern in our case of Hydroxycut Black use. Yohimbine is an alpha-2 receptor antagonist that increases both centrally mediated and peripherally mediated sympathetic activities. Caffeine also antagonizes adenosine receptors resulting in vasoconstriction. The combined effects of caffeine and yohimbine potentially increased coronary

resistance and resulted in diminished coronary blood flow leading to the development of in-situ coronary thrombosis. But, it is important to note that Hydroxycut is a multicomponent product that contains ingredients other than those listed on the label, which may have contributed to the effects observed in this patient as well.

Conclusion

We aim to increase awareness about this possible association and advocate for proper unbiased scrutiny of dietary supplements. Further research is warranted to identify components of dietary supplements.

Categories

1st year Fellow: Case

Program/Institution Name

Doctors Hospital/OhioHealth

Cardiac MRI Superseding Invasive Hemodynamic Assessment of Constrictive Pericarditis

2

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Type of submitter

Fellow in Training

Abstract

Introduction

Effusive constrictive pericarditis consists of elevated cardiac filling pressures that remain so following pericardiocentesis in addition to ventricular discordance.^{1,2} The gold standard is simultaneous right and left heart catheterization with sensitivity and specificity of 96% and 95% when ventricular discordance is observed.³ Most cases are idiopathic. It occurs in 0.3% of those with pericarditis with overall mortality of 22%.^{4,5} Following pericardiectomy, mortality is 6%.

Case Description

A 69 year old male with a past medical history of myocardial infarction and atrial fibrillation was admitted for recurrent ANASARCA and transaminitis. Echocardiogram showed a persistent moderate pericardial effusion, paradoxical septal motion, and normal tissue dopplers (image 1a). Simultaneous right and left heart catheterization was repeated following pericardiocentesis. It didn't reveal ventricular discordance and cardiac output and index remained low. (image 1b and image 1c). Cardiac MRI performed to understand the pathology showed exaggerated right to left septal deviation with inspiration and thickening of the pericardium, confirming a diagnosis of effusive-constrictive pericarditis (image 1d). He underwent pericardiectomy followed by diuresis with improvement in presenting symptoms. Pathology demonstrated thickened, fibrinous pericardial tissue.

Discussion

Cardiac MRI as a diagnostic modality for effusive constrictive pericarditis has been previously demonstrated in the presence of confirmatory hemodynamics. Its use in the absence of hemodynamic evidence has not been described. Evidence of early diastolic septal flattening and right to left septal shift with inspiration are visual markers of hemodynamic ventricular interdependence. ^{7,8}

Conclusion

In our patient, diagnosis was confirmed by cardiac MRI despite inconclusive hemodynamic testing, leading to definitive treatment of a potentially fatal condition.

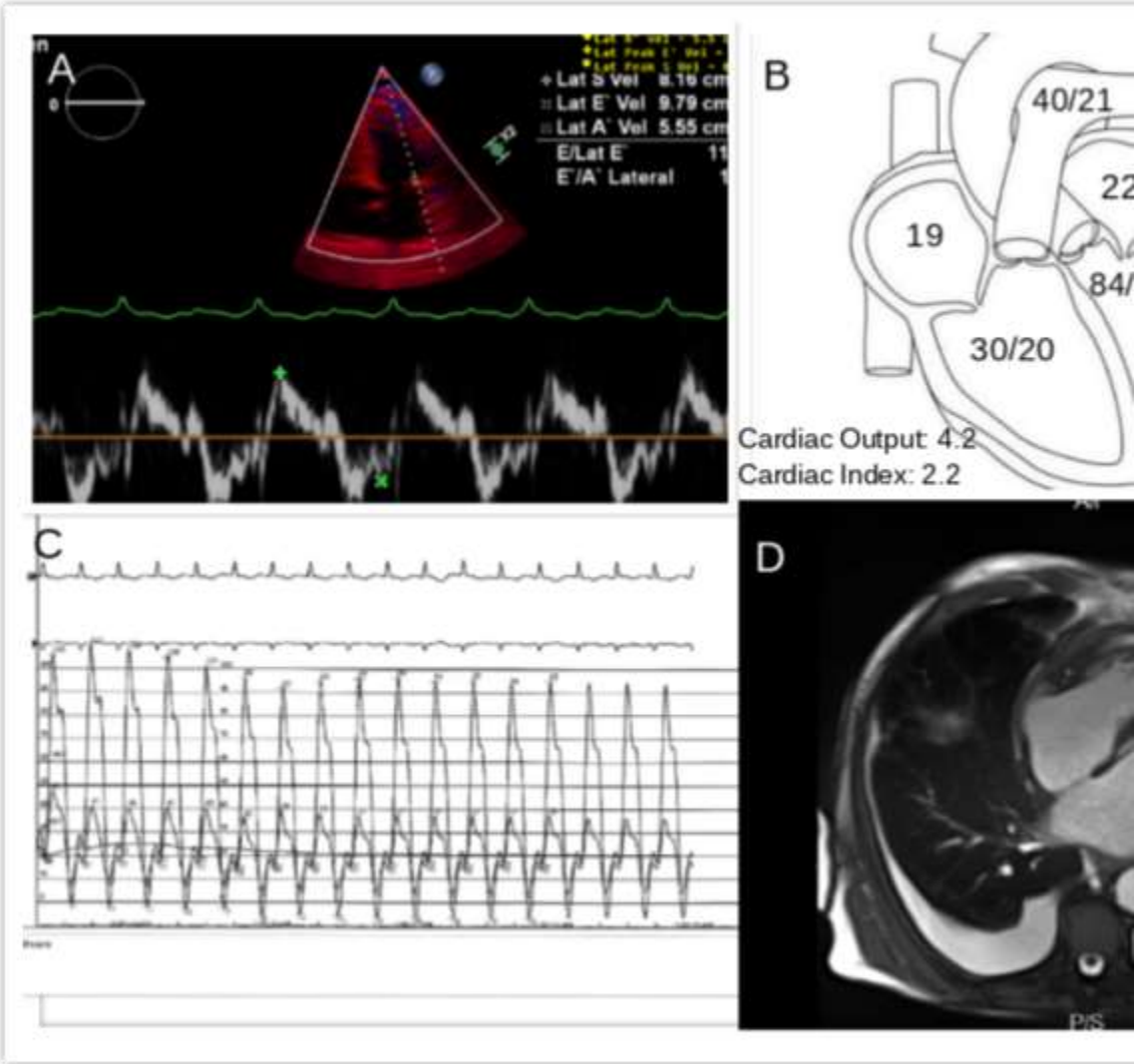


Image 1a: TTE with normal tissue dopplers

Image 1b: Intracardiac pressure diagram

Image 1c: Simultaneous right and left ventricular pressure following pericardiocentesis with inconsistent ventricular interdependence

Image 1d: Cardiac MRI with exaggerated right to left septal motion on inspiration and thickened pericardium

Categories

1st year Fellow: Case

Program/Institution Name

University of Cincinnati

ORAL PRESENTATION ABSTRACTS

Ventricular Arrhythmia Prevalence and Characteristics for HIV+ Persons and Matched Uninfected Controls

7

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Type of submitter

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Abstract

Introduction:

Sudden cardiac death and myocardial fibrosis are common in HIV. No studies to our knowledge have examined the prevalence and morphology of ventricular ectopy or arrhythmia (VEA) for HIV+ versus uninfected persons.

Methods:

We screened 5,041 HIV+ persons and 10,121 uninfected controls (matched 1:2 on demographics and location) at an urban medical center between 2000 and 2016 for VEA using administrative codes. We then reviewed electrocardiographic data to determine (1) whether VEA were present, and (2) VEA morphology (left or right bundle and inferior or superior axis). Prevalence and morphology of VEA were compared by HIV status and markers of HIV severity.

Results:

Of 5041 HIV+ persons, 139 (2.8%) had VEA vs. 165 out of 10121 (1.6%) for controls ($p < 0.001$). This association persisted after adjustment for demographics (Odds Ratio [OR] 1.53, 95% Confidence Interval [CI] 1.21-1.94) but was attenuated to non-significance after adjustment for diabetes and hypertension. Compared with HIV+ persons with nadir $CD4 \geq 200$ cells/mm³, those with nadir $CD4 < 200$ cells/mm³ had significantly elevated odds of VEA after adjustment for demographics, diabetes, and hypertension (OR 1.65, 95% CI 1.12-2.31). Likewise, each log₁₀ higher peak HIV viral load was associated with a significantly elevated odds of VEA (OR 1.24, 95% CI = 1.07-1.44) after adjustment for demographics, hypertension, and diabetes. Right bundle, superior axis morphology was somewhat more common among HIV+ versus uninfected persons, but this did not reach statistical significance ($p = 0.092$).

Conclusions:

VEA is more common among HIV+ persons but this was attenuated after adjustment for CVD risk factors. Greater HIV viremia and immunosuppression are associated with greater odds of VEA. Compared with uninfected persons, HIV+ persons may more commonly have VEA originating from the left ventricular myocardium, suggesting abnormal myocardial substrate rather than idiopathic outflow tract arrhythmia.

Categories

1st year Fellow: Research

Program/Institution Name

Ohio State University Hospital

Virtual Visits in Cardiac Electrophysiology: Patient and Physician Preference

55

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Cleveland Clinic

Type of submitter

Fellow in Training

Abstract

Background: Cardiologists have long utilized devices to follow patients with arrhythmias in order to guide management. Virtual visits have been adopted as one modality to follow-up established patients with arrhythmias. Factors contributing to patient and physician preferences with virtual visits are unknown. To our knowledge, there are no prior studies that have collected objective feedback from patients and physicians after virtual visits.

Objectives: To determine patient and physician experience with virtual visits in Cardiac

Electrophysiology.

Methods: We performed a prospective survey of patients and physicians who participated in a virtual visit in the Department of Cardiac Electrophysiology at the Cleveland Clinic from December, 2018 and July, 2019. All established patients in the Department of Cardiac Electrophysiology at the Cleveland Clinic who had a virtual visit were invited to partake in our survey. A constructed, standardized phone script and patient survey questionnaire of 15 questions was implemented for each patient. In addition, for each virtual visit encounter the cardiac electrophysiologist who performed the virtual visit was also invited to participate in a separate physician survey.

Results: 100 patient and physician virtual visit encounters were included. The average age of patients who participated in a virtual visit was 65 years old. 70% were male and 30% were female. The average distance patients participated in their virtual visit was 656 miles. Of the 100 patients who participated in a virtual visit, 64 elected to complete a survey, 10 patients declined, 17 patients were unable to be reached on follow-up, and 9 patients were not included due to technical difficulties. Of those who responded, 51 patients participated in their first virtual visit, 4 participated in their second virtual visit, and 8 participated in their third or more virtual visit. 38/64 (59.4%) of patients preferred a virtual visit for their next visit, 12/64 (18.8%) preferred an in office visit, 13/64 (20.3%) responded that their decision for a virtual or office visit depended on their specific needs, 1/64 (1.6%) did not have a preference. A total of 14 cardiac electrophysiologists participated in 100 virtual visits. 9/100 visits were not included due to technical error and inability to complete the virtual visit. Of the 91 virtual visits by physicians, 62/91(68.1%) preferred a virtual visit for their next visit, 7/91 (7.7%) preferred an in office visit, 10/91 (11.0%) responded that their decision for a virtual or office visit depended on the indication

for follow-up, 6/91 (6.6%) did not have a preference, and 6/91 (6.6%) did not indicate their preference for their next visit.

Conclusions: Both patients and physicians showed favorable responses to virtual visits, with a majority of patients and physicians preferring a virtual visit over an in-office visit for their next encounter. Factors such as convenience, cost, feasibility, and reason for follow-up were important determinants that affected both patient and physician preference.

Categories

3rd year Fellow: Research

Program/Institution Name

Cleveland Clinic Foundation