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Left Ventricular Apical Pseudoaneurysm in Asymptomatic Adult

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ABSTRACT

Aneurysms typically result from arterial wall weakening, with subsequent vessel ballooning outwards

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Introduction

Aneurysms typically result from arterial wall weakening, with subsequent vessel ballooning outwards. Left ventricular pseudoaneurysm (LVP) is a false aneurysm that results from myocardial rupture, which is enclosed by adherent pericardium or scar tissue, without myocardial tissue[1]. MI, surgery, trauma, and infection are common potential causes of LV pseudoaneurysms. Unlike LVPs, left ventricular aneurysms contain all 3 layers (endocardium, myocardium and pericardium). This case highlights the importance of modern imaging modalities to evaluate the anatomic structures of the heart.

Multimodality diagnostic techniques—including 2 dimensional and transesophageal echocardiography, color flow Doppler, radionuclide studies, digital subtraction angiography and magnetic resonance imaging—have been reported as tools to diagnose false aneurysms. Since some potential complications of untreated LVPs include infection, rupture, bleeding, and death, it is crucial to identify appropriate imaging modality that can provide high accuracy and fast results in diagnosing left ventricular pseudoaneurysm.

Case Report

A 68-year-old male with a past medical history of peripheral vascular disease, on Coumadin, obesity, and tongue cancer underwent preoperative cardiac evaluation before a glossectomy, which included a trans-thoracic echocardiogram (TTE), and cardiac computed tomography angiography (CCTA). While his initial TTE was reported normal, his CCTA showed moderatestenosis in proximal LAD with a coronary artery calcium (CAC) score of 2219. His CCTA also showed a 14mm apical pseudoaneurysm without any surrounding myocardial changes. (Figure 1-4, illustrates the apical pseudoaneurysm in axial views, sagittal view, and volume render and Video 1 provides a motion perspective).

Discussion

Pseudoaneurysms are commonly lateral or inferior in position with a narrow neck (Figure 1-4).CCTA and magnetic resonance imaging (MRI) offer a critical tool to determine anatomy, assess left ventricular volume, and evaluate myocardial viability. CT supplieshigherspatial resolution withmorphologic evaluation and accurate recognition of the pseudoaneurysm sac than other imaging modalities, including MRI, TTE and nuclear imaging.

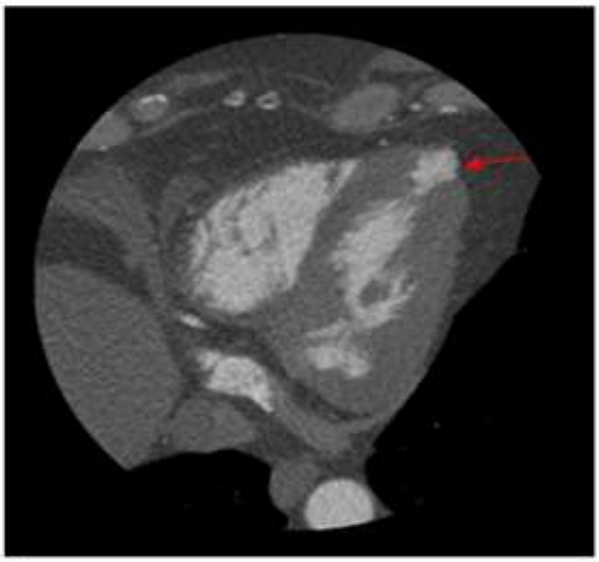

Figure 1- Axial View

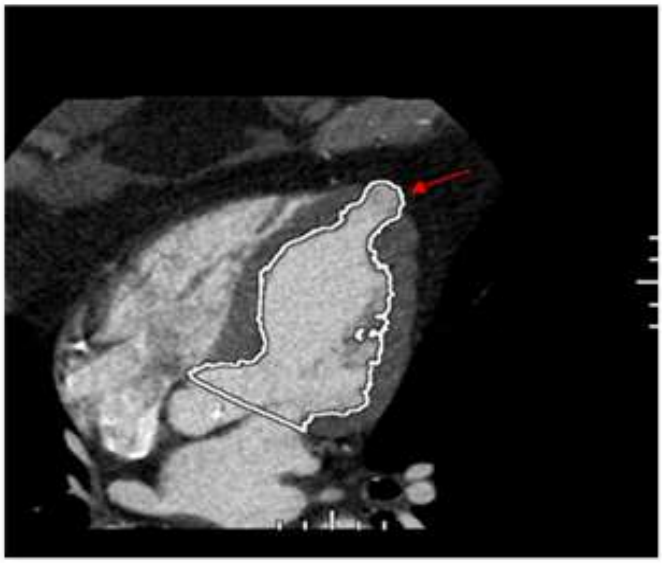

Figure 2- Axial View

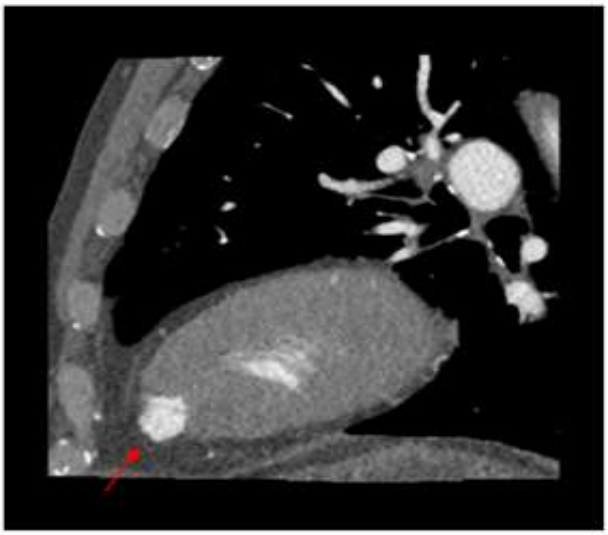

Figure 3- Sagittal View

Figure 4 – Volume Render

CCTA with ECG gating is fast, highly sensitive and cost-effective imaging modality in evaluating LVP. Though TTE and cardiac MRI can also be used to detect LVP, both have limitations. Limitations of TTE include operator dependance, poor acoustic windows and limited field of view. Cardiac MRI is an excellent imaging modality as well; however, it involves time consuming image acquisition techniques and is limited by cost and its limited availability in non-tertiary centers. In conclusion, it is vital to detect and differentiate LVP from true aneurysms, as the LVP poses a greater risk of rupture leading to death variable that is categorical or dichotomous in nature as adopted from Wooldridge (2015). The primary question that this model answers is how the chooser's characteristics affected their choosing of a particular alternative in the given sets of alternatives in the dependent variable.

References

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