

Unique Case of Septal Perforator Blood Supply

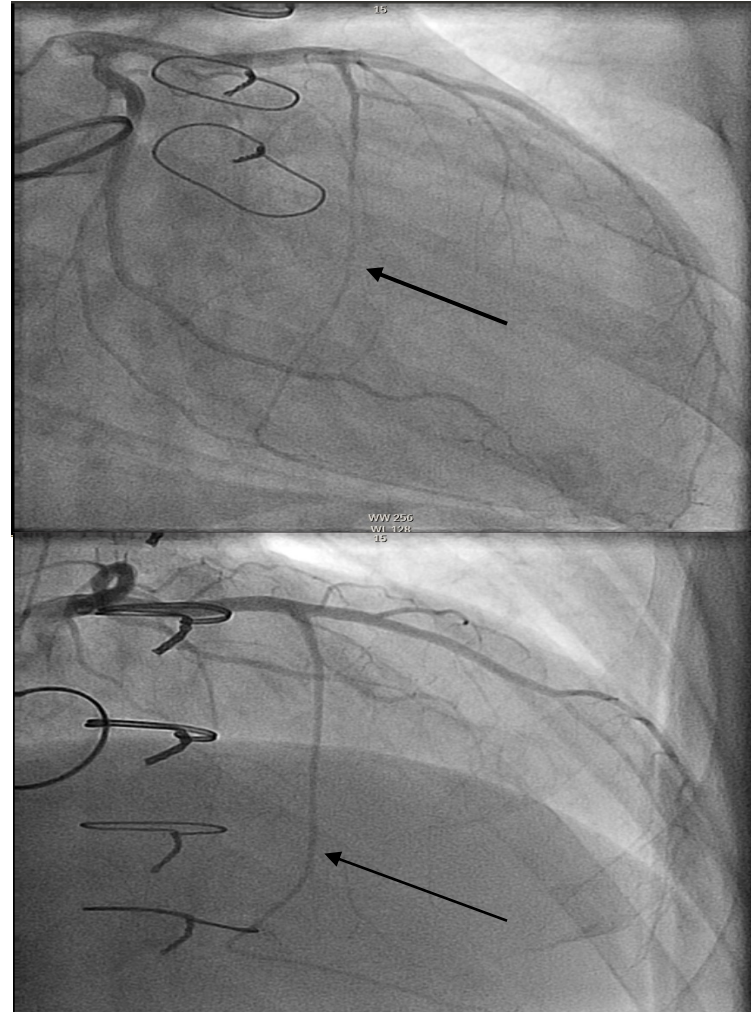
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Introduction

- Coronary artery aberrations are rare, presenting with an incidence of 0.3% to 1.0% in the general population; most are identified incidentally and remain asymptomatic.¹
- In approximately 85% of cases, there is dominance towards one side of the heart or the other. For the remaining 15%, 7% of patients experience codominance.
- Supply of the posteroinferior septum by a hyperdominant left anterior descending artery continuing as posterior descending artery is extremely rare and sporadically reported in the literature.²

Case Presentation/Patient History

- A 44-year-old male with history of aortic valve disorder with status post aortic valve replacement with mechanical aortic valve replacement in 2011 presented with 3–4-week history of progressive exertional dyspnea, edema, orthopnea, PND, and short episodes of palpitations.
- On transthoracic echocardiogram, he was found to have new onset cardiomyopathy with left ventricular ejection fraction of 25%.
- There was also notable moderate to severe mitral regurgitation and pulmonary hypertension, with a normal functioning mechanical aortic valve.
- Patient has additional history of systolic heart failure, and a 4.2 cm thoracic aortic aneurysm.



Catheterization reveals findings of a codominant-dominant system with the posterior descending artery (PDA) supplying a large posterior septal perforating artery that supplies the entire posterior interventricular septum.

Clinical Interventions

- The patient underwent left and right heart catheterization. Right heart catheterization showed elevated filling pressures due to left sided heart failure.
- Left heart catheterization incidentally showed mild nonobstructive coronary artery disease in a codominant - dominant system, where the first one-third of the inferior wall is supplied by a right PDA, and the last two-thirds of the inferior wall supplied by a left PDA through the second septal perforator of the LAD.

Discussion

- We present here a case of hyper dominant left anterior descending artery continuing as posterior descending in the presence of a diminutive right coronary artery.
- An anomalous branch arising from the left anterior descending artery was supplying the left atrium.
- To the best of our knowledge no such anomalous left atrial branch from left anterior descending is described in the literature.
- There have been documented cases of the hyper dominant LAD supplying the PDA. However, incidences of the PDA being supplied by the septal perforator are lacking.^{1,2}

References:

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2. Kim, J. H., Cha, K. S., Park, S. Y., Park, T. H., Kim, M. H., & Kim, Y. D. (2010). Anomalous origins of the right and posterior descending coronary arteries from the left anterior descending coronary artery: Unusual pattern of single coronary artery. *Journal of cardiology cases*, 3(1), e26–e28.