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Original article

Non-atherosclerotic causes of myocardial ischemia in adults encountered in our centre: A retrospective analysis

Bohara Deepak*, MahipatRaj Soni, Taksande Anup, S. Kesavan, Ajay U. Mahajan, Pratap J. Nathani

Lokmanya Tilak Municipal Medical College, Sion (W), Mumbai 400022, India

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ABSTRACT

Background: We routinely treat young patients with myocardial infarction with no conventional risk factors for atherosclerosis other than smoking. Angiogram in such patients usually shows either a recanalized artery or evidence of thrombus. We aimed at deciphering non atherosclerotic causes of ischemia at our centre.

Methods: We serially analyzed 1500 diagnostic angiograms done at our center over a period of one year, with all patients above eighteen years of age. A retrospective analysis of presentation, risk factors and treatment and outcome (when available) was done.

Results: Coronary artery thrombosis was most common cause (5 patients), followed by coronary artery dissection (3) and coronary artery embolisation (2) patients. Takayasu arteritis and anomalous origin of coronary artery were other causes.

Conclusion: Our study suggests that coronary artery thrombosis is most common non atherosclerotic cause of myocardial infarction and may respond favorably to thrombolytic treatment.

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1. Case 1: left main thrombus

A 22-year-old non-addict male presented with rest angina since 2 days. Pain was intermittent with history of index pain 1 day prior to admission. ECG on presentation showed global ST segment elevation and associated ST segment elevation in lead aVR. Echocardiogram showed apical hypokinesia with small apical LV clot with LVEF of 45%. Patient was treated with heparin and antiplatelets. A coronary angiogram done after 5 days of anticoagulation showed thrombus in left main coronary artery which had partially recanalized. (Fig. 1) Patient received aspirin and warfarin for 3 months followed by a check angiogram which showed

resolution of left main thrombus. Patient was put on aspirin therapy.

2. Case 2: spontaneous coronary dissection

35-year-old male chronic smoker for past 7 years presented with complaint of dyspnea on exertion of 6-month duration. His clinical examination was unremarkable. Routine blood investigations and lipid profile were normal. ECG showed normal sinus rhythm and poor R wave progression. A detailed 2D echocardiogram showed dilated LV with severe anterior wall hypokinesia (LVEF of 20%). Angiogram showed long

* Corresponding author. Tel.: +91 9326874463.

E-mail address: deepakabohara@gmail.com (B. Deepak).

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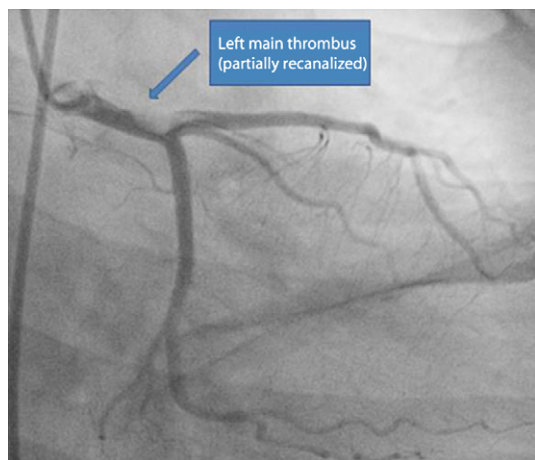


Fig. 1 – Left main thrombus (partially recanalized).

segment dissection involving left anterior descending coronary artery (Fig. 2). A diagnosis of spontaneous left anterior descending coronary artery dissection was made.

3. Case 3: coronary embolization

45-year-female, status post-mitral valve replacement for rheumatic mitral regurgitation on warfarin, presented with rest angina and breathlessness of 2 h duration. On examination she had irregular pulse, normal mitral clicks and normal second heart sound. ECG showed atrial fibrillation with 3 mm ST elevation in V1–V6 and reciprocal changes in inferior leads. 2D echocardiogram showed normally functioning metallic mitral prosthesis and anterior wall hypokinesia. His baseline PT INR was therapeutic (2.1). Patient received intravenous thrombolytic therapy followed by heparin infusion. A check coronary angiogram showed migrated thrombus in distal left anterior descending artery.

4. Case 4: anomalous origin of left coronary artery from pulmonary artery

24-year-old male presented with palpitations and breathlessness on exertion. On examination he had irregularly

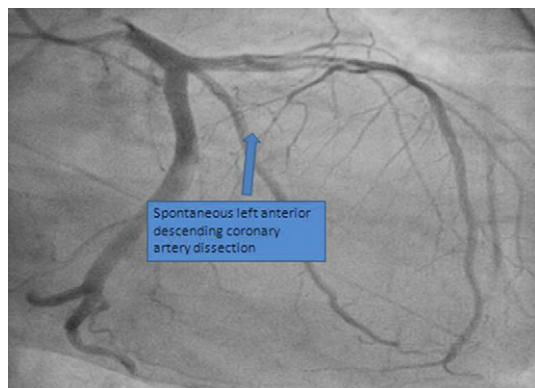


Fig. 2 – Spontaneous left anterior descending coronary artery dissection.

irregular pulse, normal blood pressure and varying first heart sound. His ECG showed atrial fibrillation with fast ventricular rate, and poor R wave progression. Detailed 2D echocardiogram showed minimally dilated LV and a dilated right coronary artery. Patient underwent a coronary angiogram which showed a hugely dilated RCA filling left system and left main arising from main pulmonary artery (Fig. 3). A diagnosis of anomalous left coronary artery origin from pulmonary artery (ALCAPA) was made. Patient was referred for surgical correction.

5. Case 5: Takayasu's arteritis with coronary involvement

22-year-female presented with gradual history of breathlessness and angina on exertion and right upper limb claudication. Examination showed absent right upper limb pulses, normal blood pressure with S3 gallop. ECG revealed poor progression of R wave with sinus rhythm. Detailed 2D echocardiogram showed dilated LV with global hypokinesia with EF of 15%. An aortogram with coronary angiogram revealed critical ostial left main stenosis with normal left anterior descending coronary artery (LAD), right coronary artery (RCA) and left circumflex coronary (LCx) artery and right subclavian stenosis. Patient underwent successful percutaneous angioplasty and stenting (drug eluting stent) to ostial left main coronary artery. Her LV function remained same at 3 months follow-up with no improvement in class of symptoms.

6. Case 6: anomalous origin of left circumflex from right coronary artery

60-year-male presented with chest pain and breathlessness on exertion. He was smoker, hypertensive and non-diabetic. His ECG on admission showed normal sinus rhythm and ST segment depression in anterior leads. A detailed 2D echocardiogram showed normal LV function. Coronary angiogram showed anomalous left circumflex coronary artery from right coronary artery, which was coursing in between aorta and pulmonary artery (Fig. 4). A CT coronary angiogram confirmed the course of the circumflex artery; with narrowing of the circumflex artery between aorta and right ventricular outflow tract. Patient was put on maximal anti-anginal management as circumflex artery was non-dominant and risk of infarction or arrhythmia was low.

7. Discussion and review of literature

Coronary artery thrombosis was most common cause of myocardial ischemia, predominantly seen in young smokers. Spontaneous dissection and coronary artery embolization were other important causes for myocardial infarction (Table 1). Anomalous origin of coronary artery from opposite sinus (ACOAS), anomalous origin of left coronary artery from pulmonary artery (ALCAPA), coronary artery spasm and coronary arteritis were other causes identified. Here we will

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