

Coronary Microvascular Disease: A Case Study

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Abstract- Coronary microvascular disease is a disease of the small blood vessels in the circulation and damage to the lining of the walls of the heart lead to narrowing and decrease blood flow to the heart muscles. Most common cause is long term diabetes mellitus. A majority of people around 60%-75% with coronary microvascular disease are affected among women. I am presenting a case study report of a 40 years old female, admitted in the hospital at IGMC, Shimla, Himachal Pradesh with the complaint of pain, pulselessness in right arm, cold extremities and blackening of fingers and gradually started numbness in left fingers also since 2 weeks. A detailed assessment and investigations concluded the diagnosis as Coronary Microvascular Disease. Other diagnosis can be performed like ECG, cardiac angiography, cardiac stress test, cardiac catheterization, coronary flow reserve (CFR). She was treated with blood thinners, statins, alpha and beta blockers.

Keywords- Coronary microvascular disease, heart, CFR, cardiac catheterization, cardiac angiography

Risk factors of coronary microvascular disease included Type 2 diabetes mellitus, obesity, hypertension, post menopause.^{6,7} Abundant evidence shows that patients with Type 2 diabetes mellitus are at higher risk of cardiovascular disorder.⁸ Sign and symptoms of coronary microvascular disease often mimic those of a heart attack. Most of the common sign and symptoms included shortness of breath, fatigue, sweating, nausea, pain in mandible, neck, left shoulder, arm, back and in chest.⁹

Diagnosis is made on the basis of Sestamibi nuclear stress test, Catheterization with coronary flow reserve(CFR), Cardiac perfusion MRI or PET scans, Coronary artery angiogram. The treatment included aspirin, calcium channel blockers, Ace inhibitors, statins and long acting nitrates.^{10,11}

Small vessel disease also leading to major amputation and vasospastic condition like frostbite, raynaud's disease may leads to digital necrosis.¹²

I. INTRODUCTION

Coronary microvascular disease otherwise known as small vessel disease.¹ It is a conditions in which walls of the small arteries in the heart aren't working properly leading to decrease blood flow to the heart muscles.² The prevalence of coronary microvascular disease in the heart has been found to be higher in women compared with men.³ It is caused due to the damage of the inner walls of the blood vessels can lead to spasms and decrease blood flow to the heart muscle.⁴ Small vessel disease manifest as a multisystem disorder which mainly affect the small arteries, arterioles, venules and capillaries.⁵

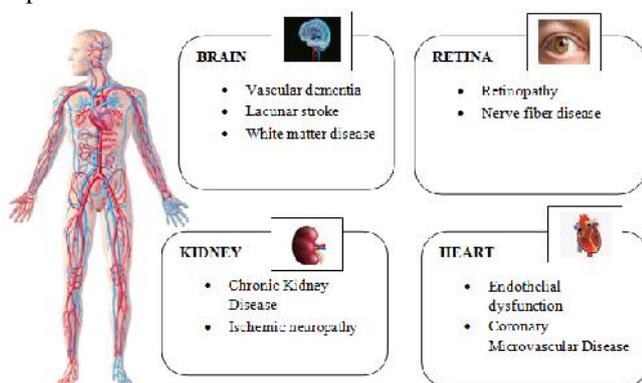


Figure 1. Microvascular disease as a multisystem disorder

II. CASE PRESENTATION

Here we present a case of Coronary Microvascular Disease. A 40 years old female, housewife visited to IGMC Shimla, H.P. with the chief complaints of pain, pulselessness in right arm, cold extremities and blackening of fingers and gradually started numbness in left fingers also. She was experiencing this symptoms from last two weeks. Patient was having a significant history of diabetes mellitus and raynaud disease since 2016.

Past Surgical History

Having significant history of below knee amputation of left leg done on 2017.

General Examination

Weight: 68Kg

Height: 160cm

BMI: 26.6kg/m²

Physical activity: having difficulty in performing daily routine activities.

Investigations

On examination peripheral pulses is absent on right side. Other investigation has been done like ECG, 2 D Echo Cardiography, X-ray, CBC, LFT, RFT. Angiography indicated that patient having diffuse small vessel disease of right radial, ulnar and femoral artery.

Treatment

Tab. Ecosprin 20mg OD, Tab. Cilostazol 100 mg BD, Tab. Ultracet 325 mg TDS, Tab. Alprex 0.25 mg HS.

Interventions

- Peripheral Angiography and CART(Controlled Antegrade and Retrograde Subintimal Tracking Technique) procedure was done.
- Patient was advised to avoid mobilization of right leg and take adequate amount of rest.

Health Education

- Eat a healthy diet- Advised to take fruit and vegetables, low-fat or fat free dairy products, poultry, fish and whole grains. Avoid excess salt and sugar.
- Regular exercise.
- Maintain a healthy weight.
- Control blood sugar.

Outcome

After the CART procedure the patient's finger's pain and coldness of extremities was relieved at some extent. Patient was advised to take the prescribed medication. Patient was advised to visit hospital after 15 days for follow up.

III. DISCUSSION

Coronary Microvascular Disease is the narrowing of the small blood vessels that branch off the coronary arteries. Mainly affect the females as with male. Most common risk factor included type 2 diabetes mellitus which may contribute to the development of coronary microvascular disease. Diagnosis of Coronary Microvascular Disease is confirmed with invasive coronary angiography, cardiac magnetic resonance imaging or PET. The treatment included blood thinners, statins, alpha or beta blockers and calcium channel blockers.^{13,14} If left untreated lead to life threatening conditions.

We can prevent coronary microvascular disease by adopting some lifestyle modification modalities such as diet

control, diabetes management, smoking cessation, reducing weight, control the blood pressure and through graded exercise program.¹⁵

IV. CONCLUSION

Coronary Microvascular Disease is a condition in which the walls of the small arteries in heart are damaged and don't dilate properly. Although many studies have been conducted which aimed at improving the medical aspect of management. This report underscores the importance of detailed history, physical examination and investigations in the diagnosis of Coronary Microvascular Disease. Additionally, good insight about the pathogenesis and the clinical presentation of Coronary Microvascular Disease improve the effectiveness of medical therapies.

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