

Case Report

RESOLVING ASYMPTOMATIC TRIPLE VESSEL CORONARY ARTERY DISEASE WITH CORONARY ARTERY BYPASS GRAFTING IN DIABETIC PATIENTS

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ABSTRACT

A 67 years old female was suffering from triple vessel disease, diabetes mellitus and was hypertensive. her lifestyle was healthy, on vegan diet, properly exercising and was asymptomatic. She was assessed through ECG, ECHO and Angiogram which indicated left wall ischemia, LMCA Calcification and LAD Type III blockage in AI, 65% lesions in LPDA. Her lipid profile was also abnormal when investigated for LDL, HDL and cholesterol. She underwent Coronary artery bypass graft to protect her from possible sudden cardiac death due to LCMA malfunction. She remained asymptomatic after the implementation of intervention.

List of abbreviations

TAD	Triple vessel disease
TVCAD	Triple vessel coronary artery disease
DMT2	Diabetes Mellitus Type 2
CABG	Coronary artery bypass graft
PCI	Percutaneous coronary intervention
TGs	Triglycerides
LDL	Low density Lipoproteins
HDL	High density lipoproteins
LMCA	Left main coronary artery
LPDA	left posterior descending artery

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DOI :<https://doi.org/10.5281/zenodo.10780657>**INTRODUCTION**

Triple vessel disease (TAD) or triple vessel coronary artery disease (TVCAD) is a severe form of coronary artery disease (CAD Zeng, Yan, & Wu). Diabetes mellitus Type 2 (DMT2) in association with TAD increases risks of cardiovascular morbidity. Cardiovascular morbid conditions are reduced with two approaches, namely, percutaneous coronary intervention (PCI) and coronary artery bypass grafting (CABG) significantly reduces cardiovascular morbidity or mortality (Liang & Gu, 2021). There is a risk of development of myocardial ischemia in asymptomatic TAD on application of stress testing (Schoenenberger et al.). CABG reduces risks of major cardiovascular events in diabetic patients as compared to PCI. (Zhao et al., 2021). Although results of both approaches are not an absolute consistent (Head et al.). Transformation of symptomatic into asymptomatic is yardstick of the efficacy of TAD in patients. In this case report, an asymptomatic TAD patient with hypertension and DMT2 was treated using CABG to prevent from cardiac arrest. Patient remained asymptomatic throughout the disease management.

Key words: Coronary artery bypass graft (CABG), Triple vessel disease, coronary artery disease, Hypertension (HTN), Diabetes Mellitus Type 2, Electrocardiogram, Diabetes Mellitus Type 2, Percutaneous Coronary Intervention (PCI)

Case Report:

A female aged 67 with type 2 DM, for more than 7 years. She was on sulfonyl urease and glucose level was within limits. Being hypertensive, She was using cardiovascular medicines, Irbesartan (150 mg q 24), Timolol (40 mg q 24hrs), Amlodipine (2.5 mg q 24 hrs.), Moxonidine (200 mg q 12hrs.), Verapamil SR (100 mg q 24hrs.), Chlorthalidone 25 mg q 24hrs, Doxazosin 2 mg q24 hrs. Still with such level of polyprescriptions for management of hypertension, his ratio of systolic to diastolic blood pressure was exceeding 160/85 mm Hg. She was not dyspneic nor was showing angina on exertion. Being a non-smoker and abstaining from alcohol consumption, She was also an avid walker, walking for 3 Km per day. His clinical diagnostics included glycated Hemoglobin levels of 7.5 mmol/ml, Creatinine level - 2 mg/dl, microalbuminuria - 41 mcg/mg of creatinine while his lipid profile was abnormal with

levels, Cholesterol – 145 mg%, Triglycerides (TGs)- 349 mg%, High density lipids (HDL) – 51mg%, Low density lipoproteins (LDL) – 139 mg%. Electrocardiography (ECG) showed indications of left ventricular strain and lateral wall ischemia. On induction of stress through running, his ECG was not normal, showing ST-segment and T- segment abnormality and this persisted for 4 min after recovery. Subjecting to treadmill, his ST-segment was elevated in aVR but angina was not observed during exercise or running. LV function was up to the mark when investigated through Echocardiogram with 66% ejection. Furthermore, on conducting coronary angiogram, it was revealed that Left main coronary artery (LMCA) was calcified with 57% disease. Anterior interventricular artery (AIV) has showing LAD Type III blockage with circumflex artery displaying 75% sidewise lesions. Compared to this, left posterior descending artery (LPDA) showed 65% lesion, marginal arteries were normal while dominance was not evident in right coronary artery with 47% proximal lesions. Patient was subjected to nuclear stress test because of stress test and TVCAD. Perfusion was mildly defective which was reversible while rest of myocardial segment was functioning properly. Gated single photon emission computed tomography showed normal wall movements. She was selected for CABG on the discretion of physician as She consented to the will of physician. Medical management was also a therapeutic option but was opted out because of intervention. She underwent minimal invasive coronary artery bypass graft. She remained symptom free after intervention.

Figure 1: ECG Subjected to Stressful Condition

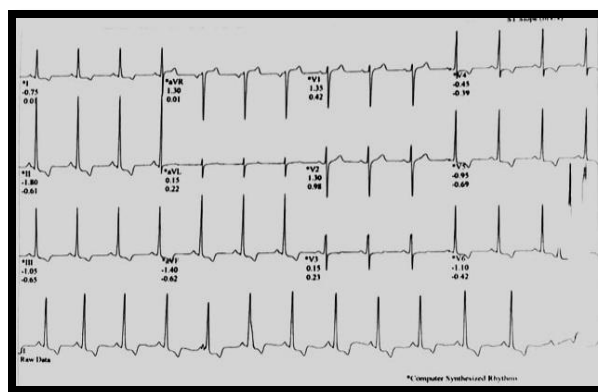


Figure 2: ECG at T = 4 min

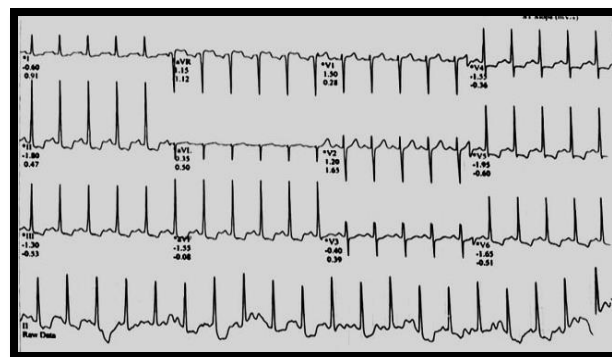


Figure 3: ECG with Lead aVR

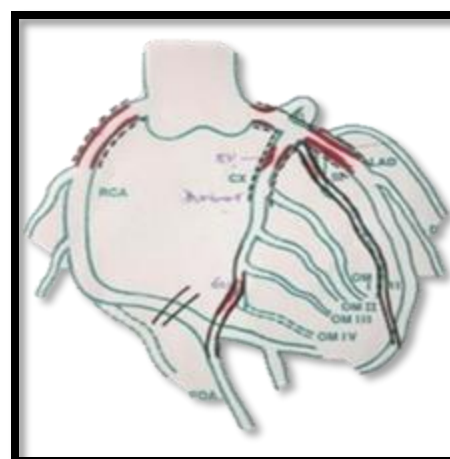
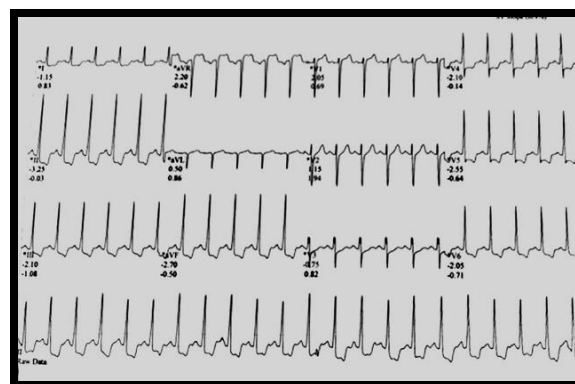
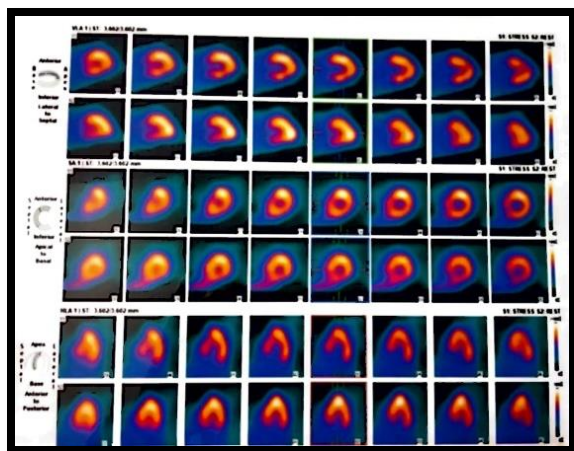


Figure 4: Coronary Angiogram





Discussion:

Triple vessel coronary artery disease is a potentially lethal condition. Increased lipid levels in combination with higher levels of glycated hemoglobin and hypertension are two comorbidities that worsens the conditions of patient and decreasing quality of life. There are two solutions to remit symptoms of TVCAD, percutaneous coronary interventions and CABG. Symptomatic patients suffer angina pectoris or exertional dyspnea. In this case ECG findings of patient displayed myocardial ischemia despite being asymptomatic. This forced investigator to number of conduct aforementioned diagnostic test along with ECHO, ECG and angiogram to assess risks of potential myocardial infection and stroke. Diabetes mellitus is a risk factor for Coronary artery disease with the risk of cardiovascular event increased with hypertension and abnormal lipid profile (Damaskos et al.). Multiple antihypertensive agents are used to regulate hypertension coupled with albuminuria in accordance with guidelines (Association, 2017). ST-Segment abnormality cannot absolutely predict the nature of any cardiovascular event but they were used as add-on to assess angina risk and dyspnea (Froelicher, Thomas, Pillow, & Lancaster, 1974). But in another study ECG variations under the influence of stressful event, exercise, carries a high predictive value for significant CAD (Andrew et al., 1984). Slower coronary occlusion was one factor responsible for TVCAD to be symptom free, the resulting maximal collaterals were obvious evidence leading to optimal circulatory flow. Despite being asymptomatic, mortality rate in TVCAD patients

remains at 4 percent according to a study. The adaptation of revascularization was based on the anatomical tissues and presence of ischemia which according to some clinical trials was efficacious (Posadzki et al., 2020), (Kokkinos). CABG is opted to prevent sudden cardiac death as his left main coronary artery was affected, otherwise, it wouldn't be adopted for this patient.

Conclusion

This case report studied a patient with multiple morbidities along with three vessel disease and was asymptomatic. She was a TVCAD patient as per angiogram while nuclear test was normal. Calcification of Left main coronary artery was reasonably justifying revascularization through coronary artery bypass graft. Although the implementation of Intervention didn't significantly made a difference. She was symptomless before the intervention and remained asymptomatic after revascularization.

Conflict of interest

Authors declare no competing conflict of interest.

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