



## MYOCARDIAL INFARCTION WITH NON-OBSTRUCTIVE CORONARY ARTERIES-AN EMERGING CARDIAC PHENOMENON IN INDIA: A CASE REPORT.

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**ABSTRACT** MINOCA is clinical syndrome characterized by the clinical features of myocardial infarction but with normal coronary arteries or no significant coronary stenosis (<50%) on coronary angiography. Here we report a case of 38 years old male presented with typical chest pain, having history of chronic smoking. On evaluation he was diagnosed with Non-ST elevation Myocardial infarction but Coronary Angiography appeared to be normal. CMRI supported the diagnosis of minoca which is still a very commonly missed entity though a common phenomenon in the community.

**KEYWORDS :** Thrombophilia, gadolinium, hyperlipidemia.

### INTRODUCTION

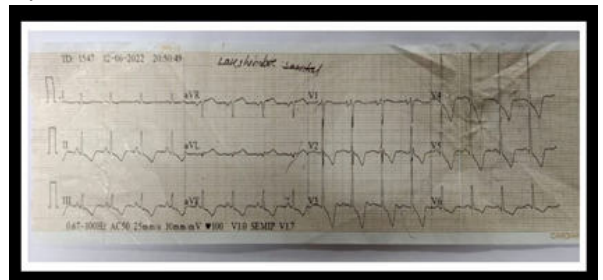
MINOCA is a clinical entity characterized by clinical evidence of myocardial infarction with normal or near-normal coronary arteries on angiography (stenosis <50%) and without an overt cause for the MI such as cardiac trauma<sup>1</sup>. It was first reported almost 80 years ago<sup>2</sup>. As a nationwide study, MINOCA-TR showed that the prevalence of MINOCA was 6.7% in patients who were diagnosed with MI<sup>3</sup>. MINOCA is also more common in younger patients and women<sup>4</sup>. The causes attributed to MINOCA is still not clear, so some additional testings has to be carried out so that etiology-targeted therapy can be implemented. A focused clinical history with a detailed assessment of the presenting symptoms, along with a family and social history, may provide diagnostic clues. When needed and if resources permit, additional testing should be considered, including intracoronary imaging studies with intravascular ultrasound or optical coherence tomography, thrombophilia testing, provocative testing for coronary vasospasm, and cardiac magnetic resonance imaging. Thrombotic disorders has been reported in 14% of MINOCA patients<sup>5</sup>, hypercoagulability detected in 3%. Provocative spasms been detected in 27% of MINOCA patients, with even higher rates noted in Asian populations<sup>6</sup>. Given the absence of significant atherosclerosis, it is intuitive that the prognosis of patients with MINOCA is better than that for myocardial infarction and CAD (MI-CAD)<sup>6</sup>. In fact, many studies have suggested a more favorable prognosis for patients with MINOCA compared with patients with MI-CAD. In contrast, a few studies have shown similar or worse outcomes for MINOCA patients<sup>7</sup>. A sizeable amount of AMI patients often presents with MINOCA which are actually missed in countries like ours due to limitations of resources as well as lack of proper guidelines and knowledge about this new entity.

### CASE REPORT

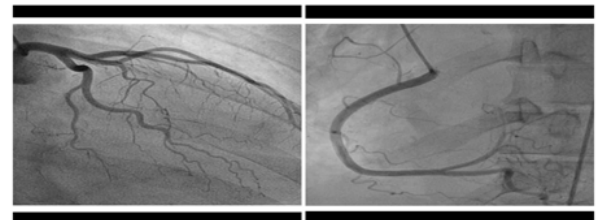
A 38 year old non-hypertensive, non-diabetic male came to ER with chief complaint of sudden onset retrosternal chest pain radiating to the left and right arm for 1 day with significant smoking history but insignificant past and family history. On examination he was having diaphoresis, tachycardia, tachypnoea, his Blood pressure was 160/100mmhg. No other abnormality detected during his systemic examination. An urgent ECG was done and blood sent for both troponin I and CPKMB. ECG showed ST depression and T inversion in lead II, III, avf, V2, V3, V4, V5, V6 with high Trpi (0.11 ng/ml) CPKMB value. Patient was stabilised and Transthoracic Echocardiography was done suggesting Regional Wall Motion Abnormality with LVEF 58%. Patient immediately treated as ACS and taken for Coronary Angiography which showed both Right and Left coronary arteries to be normal with no significant occlusion. Patient was advised CMRI with gadolinium enhancement on 7<sup>th</sup> day which is suggestive of myocardial infarction with edema. We also worked up to find out the etiology of this non-obstructive coronary artery disease like D-dimer, Protein C, S to rule out pulmonary thromboembolism and other thrombophilias but reports came normal.

With these above investigations we reached to a working diagnosis of

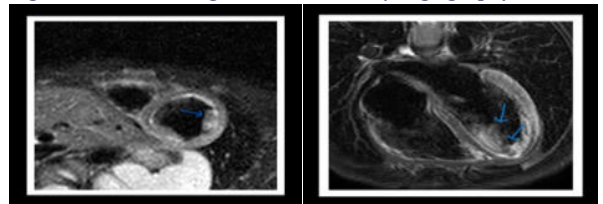
Non-obstructive AMI and patient was started with statin, anti-platelet therapy, Beta-blocker and ARB. Patient was finally discharged after 10 days in stable condition.



**Fig1.0-12 lead eeg showing ST-depression and T-inversion in II,III,avf and multiple precordial leads.**



**Fig2a and b-Normal right and left coronary angiography.**



**Fig3a: CMRI short axis view and Fig3b: 4 chamber view-showing myocardial infarction with edema involving infero-lateral wall.**

### DISCUSSION

MINOCA continues to be a therapeutic challenge as patients may exhibit a different cardiovascular risk profile than obstructive CAD patients. Current methods of treatment include targeting known cardiovascular risk factors and prescribing angiotensin-converting enzyme inhibitors and beta-blockers to alleviate symptoms associated with myocardial ischemia<sup>8</sup>. MINOCA has been found to be more prevalent in women and younger adults and affect patients who report a higher frequency of hypertension than a diagnosis of hyperlipidemia or diabetes. Further evaluating the mechanisms of potential underlying causes, such as coronary spasm, should be regularly considered as a

differential diagnosis as it may provide important clinical implications for future treatment. CMR is a clinically relevant noninvasive imaging modality for the assessment of patients presenting with MINOCA. The myocardial characteristics of CMRI can be used to identify focal edema and fibrosis with T2-weighted and late gadolinium enhancement (LGE) images<sup>9</sup> and can assess diffuse myocardial fibrosis with elevated extracellular volume (ECV) fraction. Here, we report a case of Myocardial infarction of non-obstructive coronary pathology where the CAG showed no stenosis of coronaries but CMRI supported the diagnosis with myocardial infarction with edema. Though Optical Coherence Tomography (OCT) and Intravascular Ultrasonography (IVUS) are often valuable in the diagnosis of MINOCA but we could not perform it at our centre.

## CONCLUSION

This is one of the first cases of Myocardial Infarction Of Non-Obstructive coronary Artery disease diagnosed in our small state of Tripura using patient's clinical presentation and the other non-invasive diagnostic modalities though due to some limitations of advanced diagnostic techniques, we couldn't further evaluate the patient. Among the Indian population, MINOCA could be a challenging situation leading to a major cause of cardiac-related morbidity and mortality, thus demanding a high level of awareness and a diagnostic eye among young physicians.

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