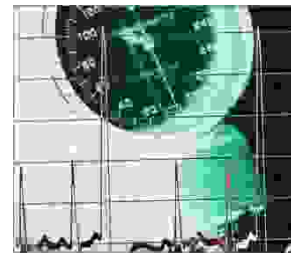


## CASE REPORT

PROF-776

# A CASE OF ELECTRIC SILENCE

## (NORMAL ELECTROCARDIOGRAM, NORMAL EXERCISE TOLERANCE TEST AND POSITIVE TROPININ-T IN A PATIENT WITH TIGHT LEFT CIRCUMFLEX CORONARY ARTERY DISEASE)



**BRIG DR. ZAFAR UL ISLAM, FCPS**

Head Department of Medicine  
Combined Military Hospital  
Multan.

**ZULFIQAR A KANGO DIP CARD (UK)**

Department of Medicine  
Combined Military Hospital  
Multan.

**ABSTRACT...** [osabeeka@yahoo.com](mailto:osabeeka@yahoo.com) This is a case report of a patient with chest pain who had normal non invasive investigations at various occasions. He was put on anti anginal therapy and advised follow up. More invasive investigations were not carried out at that time because of negative exercise tolerance test (ETT). Patient had repeated visits with atypical chest pain and no electrocardiogram (ECG) evidence of ischemia during pain or during ETT. At one such visits patient was advised Trop-T that turned out to be positive. Coronary angiogram was advised and that revealed critical disease in his Left circumflex coronary artery (Cx). It was treated with intra coronary stents, and patient became symptom free. This is one of those cases with normal ECG during ischemic anginal episodes and normal ECG during exercise induced ischemia.

**Key words:** Circumflex coronary artery. Troponin-T. Electric Silence.

## INTRODUCTION

Circumflex coronary artery disease may become difficult to diagnose as it may remain undetected on various non invasive investigations. Electrocardiogram and exercise electrocardiogram have lowest sensitivity for Cx artery disease when compared with other coronary arteries. It is less likely to be detected and more important when the symptoms are atypical or producing silent ischemia. This makes way for introduction of the term "ELECTRIC SILENCE".

## CASE REPORT

Mr. S A is a government employee in his early forties. He was previously healthy and recently developed choking sensation in throat. His symptom appeared

with moderate exertion and relieved by taking rest. He has been smoking 10 to 20 cigarettes per day for the last 20 years. His father was diagnosed as a case of ischemic heart disease at the age of fifty. On examination he was medium built person with blood pressure of 130/80 and pulse 76 per minute regular. Systemic examination was unremarkable. His resting ECG was normal. He had fasting cholesterol level of 208 mg/dl, Triglycerides 380 mg/dl, Fasting blood sugar 90 mg/dl. He was advised exercise tolerance test twice at two different centres and the test was negative for ischemia at both occasions but positive for angina at 100% target heart rate. In view of the above he was put on anti-anginal therapy including nitrates, beta blocker, and aspirin. He became symptom free with medication. He was advised to continue with medical therapy, quit

smoking and have regular follow up. He continued to have vague symptom without any ECG change or ETT findings. As the patient was very keen for further investigations he was advised Trop-T. It

turned out to be positive. Coronary angiogram was advised that revealed critical disease in early mid course of left circumflex artery that was treated by deployment of intra coronary stent.

**Table: I**

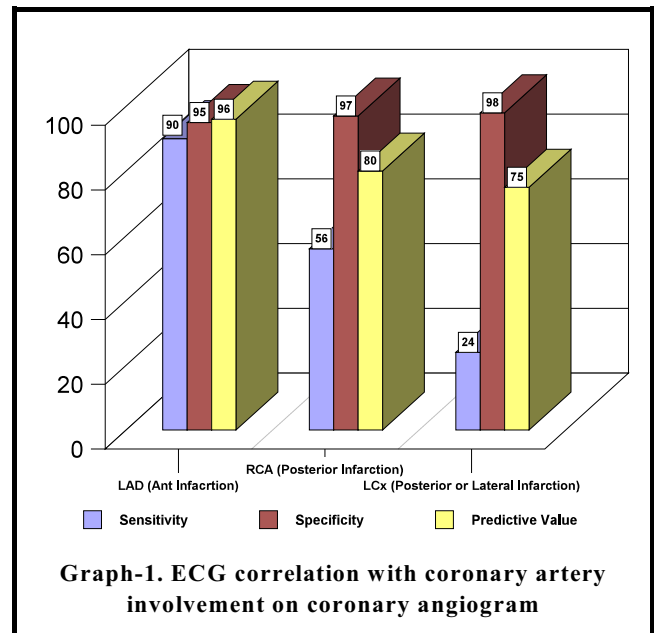
	SYMPTOMS	ECG (Ischemic Changes)	ETT (Exercise induced Ischemia)	ANGIO(Coronary Artery Disease)
SILENT ISCHEMIA	-	+	+	+
SYNDROME "X"	+	+	+	-
(ELECTRIC SILENCE) (Proposed term) e.g. Circumflex Disease	+	-	-	+
(DEADLY SILENCE) Silent Ischemia of Cx Disease (Theoretical Scenario)	-	-	-	+

**DISCUSSION**

Disease in the Circumflex coronary artery can go undetected in the non invasive investigations such as resting ECG and exercise tolerance test (ETT)<sup>1</sup>. Even during an episode of angina or acute coronary insufficiency, resting ECG may remain normal. Sensitivity of ECG is minimum when coronary involvement is limited to Left Circumflex Coronary artery (LCx), Further investigation of disease with the help of exercise tolerance test also carries low sensitivity in the cases of LCx. Diagnosis can become even more difficult in the presence of atypical history or silent ischemia. A positive Troponin T is suggestive of myocardial ischemia in the absence of any ECG fiinds. Troponin-T is a helpful investigation in such situations.

In one study the sensitivity, specificity, and predictive value for; (a) ECG indicative of anterior infarction and occlusion of the left anterior descending coronary was 90, and 96 per cent, respectively; (b) ECG indicative of inferior infraction and occlusion of the right coronary artery was 56, 97, and 80 per cent, respectively; (c) ECG indicative of posterior or lateral infarction and obstruction of the left circumflex coronary was 24, 98, and 75 per cent, respectively

[Graph-1]<sup>2</sup>.



The sensitivity of exercise ECG for single-vessel disease ranges from 25 to 71 per cent, with exercise-induced ST segment displacement most frequent in patients with left anterior descending coronary artery disease, followed by those with coronary artery disease and those with isolated left circumflex

coronary disease<sup>3</sup>. Positive Troponin-T test alone independent of ECG changes is suggestive of myocardial ischemia<sup>4</sup>. There have been various studies showing significance of troponin T in the diagnosis of unstable angina and NSTEMI (Non ST elevation Myocardial infarction)<sup>5</sup>. Coronary angiogram is stated to be gold standard in the diagnosis of coronary artery disease<sup>6</sup>. But it has its limitation in cases involving micro vasculature. It is here that perfusion scans come into action to diagnose micro vascular ischemia. The sensitivity of the test in the diagnosis of coronary heart disease (CHD) is approximately 90 percent, greater than that achieved with the exercise electrocardiogram. Scintigraphy is also useful in evaluating myocardial viability, in establishing the “culprit” lesion prior to revascularization, in assessing the completeness of revascularization, and in the risk stratification of patients with stable CHD, post myocardial infarction, post-unstable angina, and prior to vascular surgery<sup>7</sup>.

There is a well known condition called “Silent Ischemia”. Patient is symptom free but his resting ECG, Holter Monitoring, and exercise ECG are strongly suggestive of ischemic heart disease. At the other end of spectrum is “Syndrome X” or micro vascular disease where there is ischemia in small microscopic vessels but main coronary arteries are normal so is coronary angiogram. This micro vascular ischemia can be picked up by ETT and Thallium Stress Test (Table-I) . In between is a group of patients with symptoms very much suggestive of ischemic heart disease but non invasive investigations like ECG, exercise ECG are normal and make a weak case for further investigations like perfusion scans or invasive investigations such as coronary angiogram. In other words electrical activity of heart is not helpful even in the presence of severe disease. We propose a term “ELECTRIC SILENCE” for this condition as demonstrated by our patient. An other group of patient theoretically speaking is possible though case is never reported. There may be a symptom free patient with coronary artery disease and normal

electrical activity on ECG and negative ETT. This scenario may even be more dangerous and is not expected to report for medial help. Using the term DEADLY SILENCE would be appropriate here [Table-I] as the patient can not be picked up at any stage, so that he is never expected to have coronary angiogram. Here the role of troponin-T becomes more important towards diagnosis of ischemia.

## REFERENCES

1. Braunwald: **Heart disease, Fifth Edition** W.B. Saunders Company 1998.
2. Blanke, H., Cohen, M., Schlueter, G.V., et al: **Electrocardiographic and coronary arteriographic correlations during acute myocardial infarction.** Am. J Cardiol 54:249, 1984.
3. Folland, E.D., Vogel, R.A., Hartigan, P., et al; **Relation between coronary artery stenosis assessed by visual, caliper, and computer methods and exercise capacity in patients with single-vessel coronary artery disease.** Circulation 89:2005, 1994.
4. deFillppi , CR, Tocchi, M, Pamarmer, RJ, et al. **Cardiac troponin T in chest pain unit patients without ischemic electrocardiographic changes: Angiographic correlates and long-term clinical outcomes.** J Am Coll Cardiol 2000: 35:1827.
5. **Myocardial infarction redefined-a consensus document** of The Joint European Society of Cardiology/American College of Cardiology Committee for the redefinition of myocardial infarction, J Am Coll Cardiol 2000: 36:959.
6. Little, WC. **Angiographic assessment of the culprit coronary artery lesion before acute myocardial infarction.** Am J Cardiol 1990; 55:44G.
7. Beller, GA, Zaret, BL. **Contributions of nuclear cardiology to diagnosis and prognosis of patients with coronary artery disease.** Circulation 2000;101:1465.