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Case Report

An 83-Year-Old Woman Undergoing Left Main Coronary Angioplasty: A Case Report

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ABSTRACT

Several studies have shown that during ischemia, repolarization indices such as QTC are prolonged. We describe a typical case with left main disease and prolonged QTC recovering to the normal range after angioplasty. ***(Iranian Heart Journal 2022; 23(4): 97-101)***

KEYWORDS: QTC, LM angioplasty, Wellens' sign

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It has been demonstrated that QT interval and QT dispersion may be prolonged during acute myocardial ischemia.[1] Several mechanisms secondary to acute myocardial ischemia have been proposed in QT interval prolongation, including elevations in extracellular potassium levels, acidosis, anoxia , changes in the myocardial response to catecholamine or cholinergic stimulations, and changes in the intracellular hydrogen concentration.[2]
We herein describe an old woman with left main (LM) stenosis, contributing to QT prolongation, and the correcting effect of revascularization.

Case Report

An 83-year-old woman was admitted to our hospital for loss of consciousness. The patient was diagnosed with opium toxicity, and she underwent related treatments. After a few hours, her consciousness recovered to normal, but she experienced severe dyspnea. She was transferred to the coronary care unit with a diagnosis of pulmonary edema.
The patient had been suffering from exertional chest pain and dyspnea during the preceding few months without any evaluation or treatment for possible underlying ischemia. Her past medical history included hypertension of a few years' duration, for which she had been taking medication.
An electrocardiogram (ECG) for an early evaluation of feasible basic ischemia revealed a normal sinus rhythm with giant inverted T waves in V_1–V_6 (Wellens' sign), I, and AVL leads. More careful evaluations of the ECG showed a long QTC interval of 650 milliseconds (using the Bazett formula: $QTC=QT/\sqrt{RR}$) (Fig. 1).

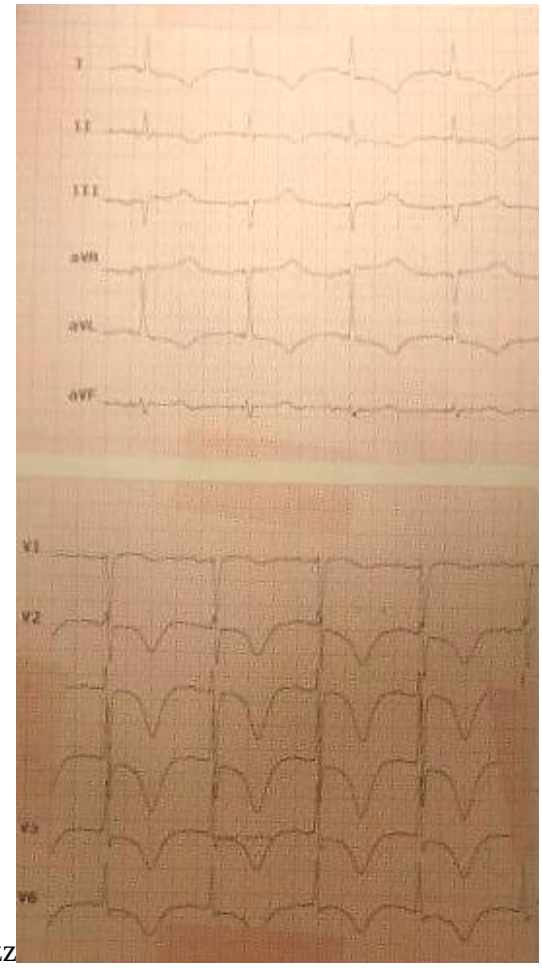

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Figure 1: The electrocardiogram on admission in the emergency department shows a giant T-wave inversion in the precordial, I, and AVL leads.

On admission, transthoracic echocardiography demonstrated a preserved systolic function with no significant valvular diseases as a probable cause of pulmonary edema. Further meticulous assessment confirmed that the primary reason for the pulmonary edema was severe ischemia; accordingly, the patient was recommended for coronary angiography. A detailed explanation about this procedure was provided to the patient, who gave consent to undergo the procedure. A diagnostic angiography was performed via the right femoral artery, and, expectedly, it revealed a significant transmural ischemia. Additionally, there was 90% stenosis at the origin of the LM artery (Fig. 2).

Figure 2: The angiogram shows significant stenosis at (95%) at the left main ostium.

Consequently, we suggested coronary artery bypass graft surgery (CABG) to the patient as the treatment of choice and provided her with consultation with a heart surgeon immediately. However, she opted for percutaneous angioplasty instead of CABG. Under the supervision of an anesthesiologist and available emergent heart surgery and intra-aortic balloon pump equipment, the patient was transferred to the catheterization laboratory for LM angioplasty.

After wiring was done, the LM was predilated with a coronary balloon. Then, a drug-eluting coronary stent was deployed at the origin of the LM artery and was postdilated. Following images showed a plaque protrusion and stent under-expansion at the origin of the LM artery (Fig. 3). Thus, another stent was deployed at the site of the protrusion and was postdilated. The amount of contrast medium used was 400 mL. The procedure was performed in the cardiac catheter laboratory under local anesthesia in 30 minutes, and the patient remained hemodynamically stable throughout. She was thereafter transferred to the cardiac care unit for observation and was discharged to the ward the following day. The postprocedural ECG showed QTC

improvement after successful revascularization (Fig. 4). The patient was asymptomatic and consequently discharged home after 3 days. A 2-week follow-up ECG confirmed normal sinus rhythm, and the patient remained asymptomatic.

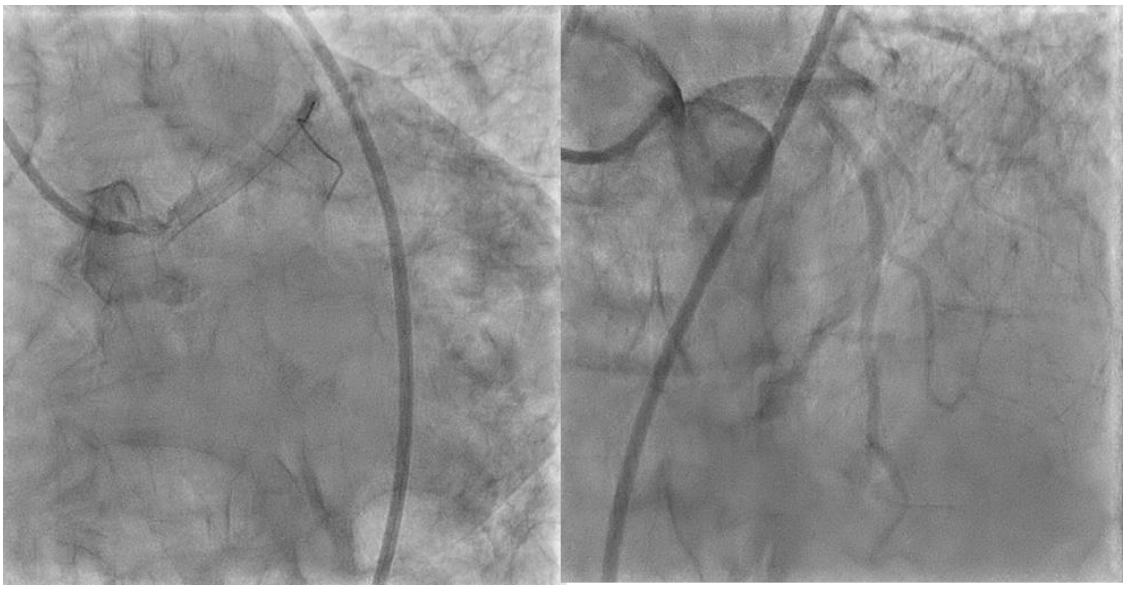

Figure 3: Left: After the first stent deployment, plaque protrusion is significant. Another stent is deployed, and the final result is acceptable (right).

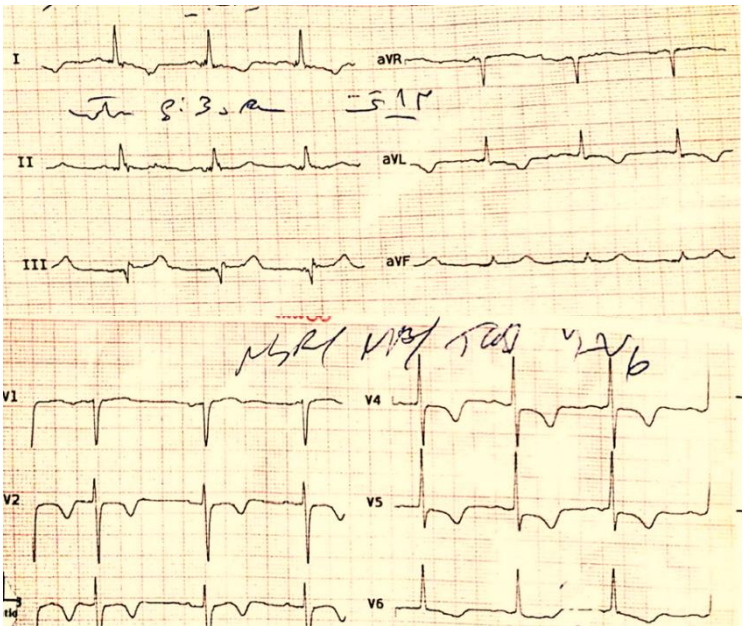

Figure 4: The electrocardiogram after revascularization illustrates the recovery of the QTC interval to the normal range.

DISCUSSION

LM coronary artery disease as a result of an at-risk large myocardial territory predicts higher prognostic risks. The existing guidelines recommend CABG as the class I indication for myocardial revascularization.[3] Currently, in the United States guidelines, percutaneous coronary intervention (PCI) in selected patients with LM stenosis in the ostium or shaft, without coexisting multivessel disease, and the increased risk of surgical bypass, has a class IIa recommendation.[4] Our patient had severe stenosis in the LM ostium, and she chose to undergo percutaneous angioplasty. Before revascularization, however, her QTC interval was prolonged. Revascularization was performed successfully, and the QTC interval returned to the normal range.

Similar to our findings, some other studies have demonstrated that successful PCI may improve ventricular repolarization abnormalities.[5] Recently, Nowinski et al[6] discovered that the myocardial ischemia during balloon inflation in PCI contributed to significant prolongation in the QT interval, which continued for minutes or even hours. These findings suggest that the QT interval can be an early marker of myocardial ischemia.[7]

CONCLUSIONS

We herein presented a case of successful LM angioplasty on a patient presenting with dyspnea correlated with a prolonged QTC interval as a marker of ischemia. The correction of the QTC interval after revascularization proved that it was due to significant myocardial ischemia.

Acknowledgments: None

Conflict Of Interest: All the authors have no conflicts of interest to declare.

Ethics Statement: Consent for publication without considering the name has been obtained from the patient. As it is a case report, no approval from our ethics committee was required.

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