



Case Report

Hiccups as the only symptom of acute myocardial infarction

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ABSTRACT

Hiccups are usually benign, while myocardial infarction (MI) has the potential for morbidity and mortality. Here, we report 3 cases of MI, with hiccups being the only symptom on presentation to the emergency department. Attention should be given to patients who present with hiccups and multiple risk factors for acute coronary syndrome, especially those with factors predisposing them to atypical presentations, such as diabetes mellitus, and old age.

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1. Introduction

ST-segment elevation myocardial infarction (STEMI) or non-ST-segment elevation myocardial infarction (NSTEMI) is a common cardiac emergency, with the potential for substantial morbidity and mortality [1]. In contrast, hiccups are usually benign and self-limited. Pathological intractable hiccups or hiccups secondary to other diseases such as emergent MI occur infrequently [2–4]. In individuals prone to atypical presentations of MI, such as those with diabetes, females, and elderly individuals [5], hiccups can easily lead to a misdiagnosis. Here, we report 3 cases of MI with hiccups being the only symptom on presentation to the emergency department (ED) of Taipei Veterans General Hospital between 2017 and 2018.

2. Case 1

A 77-year-old Asian man visited our ED because of intractable hiccups for 2 weeks. His Taiwan Triage and Acuity Scale (TTAS) score was 4. His medical history included type 2 diabetes mellitus. His hiccups reportedly worsened in the prior 2 days. He did not complain of chest tightness, pain or dyspnea. However, a 12-lead electrocardiogram (ECG) revealed a QS pattern with persistent ST-segment elevation in the anterolateral leads (Fig. 1A). The troponin I level was 2170 ng/L (normal range < 300 ng/L) and the creatine kinase level was 80 U/L (normal range 24–168 U/L). Emergent coronary angiography (CAG) revealed total occlusion of the left anterior descending artery (LAD) with thrombus below the proximal segment (Fig. 2A). Percutaneous

coronary intervention (PCI) was performed with stents deployment. The hiccups subsided after the procedure.

3. Case 2

A 64-year-old Asian man visited our ED because of intractable hiccups with poor appetite for 1 day. His TTAS score was 4. His medical history included type 2 diabetes mellitus, previous acute multiple left-brain infarctions, high-grade stenosis of the right carotid artery, and hypertension. He did not complain of chest tightness, pain, or shortness of breath. Laboratory data revealed the following: troponin I, 8590 ng/L; creatine kinase, 709 U/L; C-reactive protein, 11.08 mg/dL (normal range < 0.5 mg/dL); and white blood cells, 14,200/L (4500–11,000/L). ECG revealed pathological Q-wave over II and aVF along with poor R progression V1–V4 and T-wave inversion over leads III and aVF (Fig. 1B). This EKG implied inferior and anterior old scar [6]. He was admitted to the intensive care unit with the diagnosis of NSTEMI. Coronary angiography was performed on day 3 and revealed LAD-M 90% stenosis, LAD-D 80% stenosis, left circumflex artery middle part (LCX-M) 80% stenosis, right coronary artery middle part (RCA-M) 80% stenosis, and RCA-D 75% stenosis (Fig. 2B). PCI was performed successfully with balloon angioplasty and stenting in the LAD-D, LAD-M to D, LAD-P to M, and LCX-P to M. Hiccups improved after revascularization. The patient was discharged to home on day 14.

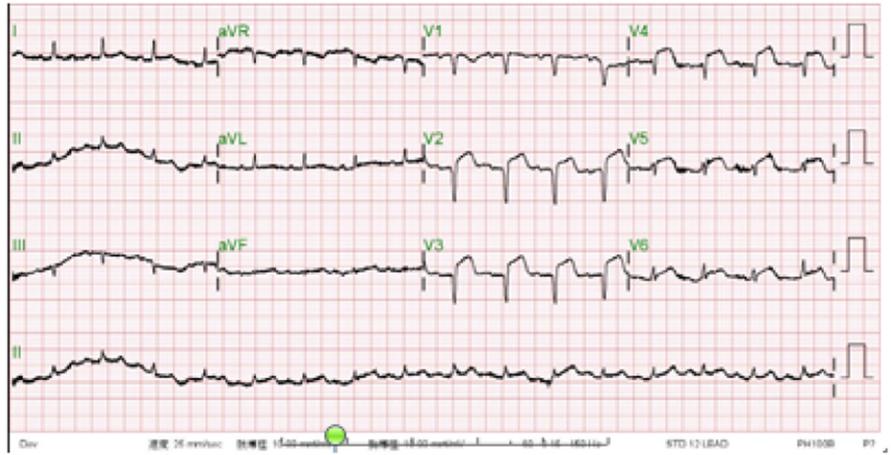
4. Case 3

A 70-year-old Asian man visited our ED because of intractable hiccups for 2 days. His TTAS score was 4. His medical history included benign prostatic hyperplasia. He did not complain of chest tightness, pain, or dyspnea at presentation. However, a 12-lead ECG revealed a

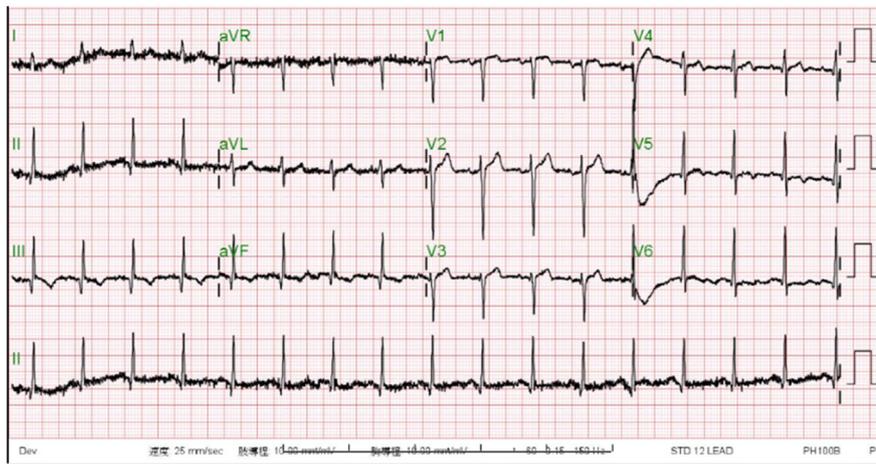
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(A)



(B)



(C)

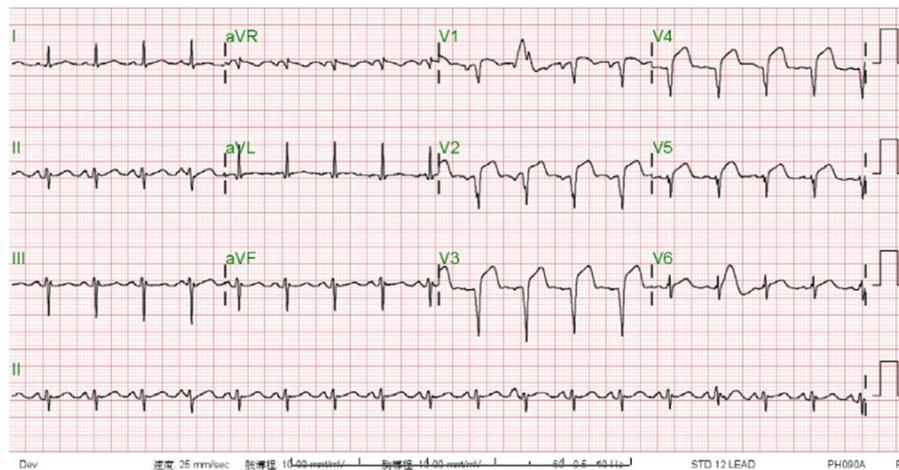
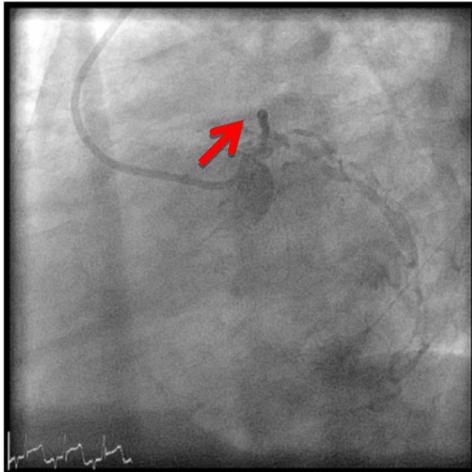
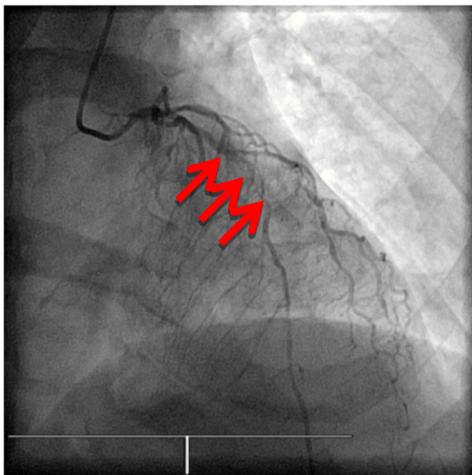


Fig. 1. A: Sinus rhythm: QS pattern with persistent ST-segment elevations in the anterolateral leads. B: Sinus rhythm: Pathological Q-wave in II and aVF, poor R progression over V1–V4, and T-wave inversion in leads III and aVF. C: Sinus rhythm: ST-segment elevations in the anterior-lateral leads.

(A)



(B)



(C)

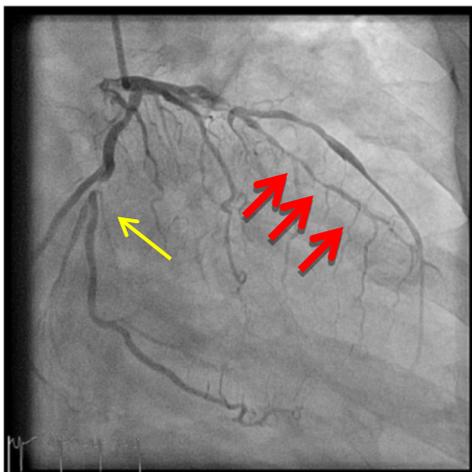


Fig. 2. A: Red arrow, LAD proximal total occlusion. B: Red arrows, LAD diffuse stenosis. The LCX lesion cannot be observed in this view. C: Red arrow, LAD 99% stenosis with long diffuse segmental lesion. Yellow arrow, LCX 90% stenosis.

QS pattern with persistent ST-segment elevations in the anterolateral leads (Fig. 1C). His troponin I level was 4470 ng/L and creatinine kinase level was 144 U/L. He did not undergo primary PCI because of acute delirium. He was admitted to our intensive care unit. His troponin I level peaked on day 1. CAG on day 3 revealed LAD 99% and LCX 90% stenosis (Fig. 2C). PCI with balloon angioplasty and stenting in LAD-P to M and LCX-M was performed successfully with Thrombolysis In Myocardial Infarction (TIMI) III flow. The hiccups subsided on post-catheterization day 2. He was discharged to home on day 12.

5. Discussion

Only 1 case of NSTEMI with hiccups as the single presenting symptom at the ED has been reported in the last 50 years [2]. In our 3 cases, the patients only complained of hiccups and displayed no other symptom that indicated MI. According to a previous study, hiccups can rarely be associated with inferior wall MI [7]. Although, there is inferior wall scar in case 2, the ongoing MI site in our 3 cases included the anterior wall and anterolateral wall, but not the inferior wall.

The hiccup reflex arc consists of 3 components, namely the afferent limb, including the phrenic, vagus, and sympathetic nerves, which convey somatic and visceral sensory signals; the central processing unit in the midbrain; and the efferent limb traveling in motor fibers of phrenic nerves to the diaphragm and in accessory nerves to the intercostal muscles [8,9]. A previous hypothesis on the mechanism of hiccups in association with MI suggests that causative factors released from ischemic tissues act on the hiccup arc or induce ischemic injury of the sensory branches in the pleura, pericardium, and peritoneum, which also send signals to the phrenic nerves. Hence, myocardial ischemia can also cause vagal and phrenic nerve irritation [7–9].

Our patients had multiple risk factors for acute coronary syndrome, including old age, male sex, diabetes mellitus, hypertension, and tobacco use. Diabetes mellitus and old age are known predisposing factors that cause atypical presentations in acute coronary syndrome [5].

In conclusion, although hiccups are common and usually benign, those that are not self-limited should be considered as a symptom of a serious underlying pathology such as MI. It is unrealistic to order a full workup for every patient who presents to the ED with hiccups, but attention should be given to those with multiple risk factors for acute coronary syndrome, especially those with factors predisposing to atypical presentations.

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