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Case Report

Oral magnesium supplement induced acute retrosternal chest pain: An esophageal ulcer due to a less well-known cause

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ABSTRACT

Retrosternal chest pain is the most common complaint of all emergency room visits. Once life-threatening causes have been thoroughly ruled out, other pathologies with favorable prognoses may be omitted. In this case report, we introduced a 79-year-old female patient with an esophageal ulcer who was complaining of severe acute onset retrosternal chest pain.

Keywords: Acute coronary syndrome, angina pectoris, general cardiology, non-cardiac chest pain.

Retrosternal chest pain is the most common complaint of all emergency room (ER) visits.[1] It is known as an initial symptom of many life-threatening diseases including cardiac and non-cardiac etiologies. In many ER, once life-threatening causes are thoroughly ruled out, other pathologies which have favorable prognoses including esophageal disease, musculoskeletal causes, pneumonia/pleuritis, or pericarditis may be omitted. In this case report, we introduced a patient with an esophageal ulcer who was complaining of severe acute onset retrosternal chest pain.

CASE REPORT

A 79-year-old female presented to ER with acute onset retrosternal chest pain which was the worst pain she has ever felt for two hours. She was anxious and pointed behind the sternum and characterized as a burning sensation and expanding to both arms. Her medical history was significant for hypertension, diabetes, and obesity. Also, the non-critical coronary disease was viewed two years ago by her coronary angiography. Her medication included acetylsalicylic acid, ACE inhibitor, beta-blocker, and magnesium supplement for hypomagnesemia. She reported no alcohol and tobacco use.

On the patient's physical examination-oriented to time, place, and person; judgment and insight intact, but she was alert. Body temperature was 36.5°C, blood pressure was 140/70 mmHg, pulse rate was 68 beats/min, respiratory rate was 20 breaths per min, oxygen saturation was 97% on room air, and pain scores were 10/10. Her respiratory, musculoskeletal, neurologic, and gastrointestinal systems examinations were within normal range except for her high body mass index of 32. The patient's heart sounds were not abnormal. There was no jugular venous distention, and no carotid or abdominal bruits. Carotid, radial, posterior tibialis, and pedal pulses were palpable symmetrically and no edema.

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The patient and ER practitioner focused on the acute coronary syndrome. Electrocardiogram (ECG) and cardiac enzyme measurements were performed twice and did not reveal acute coronary syndrome. No new ischemic change was observed on the 12-lead ECG. There was no new pathological sign-on transthoracic echocardiography. Due to the slightly high D-dimer level and COVID-19 pandemic, computed tomography and PCR tests were performed, and coronavirus infection was excluded. Together with coronavirus infection exclusion, alternative life-threatening causes of acute chest pain, especially pulmonary embolism (PE), aortic aneurism, aortic dissection, pneumothorax (PTX), and pericardial tamponade were excluded.

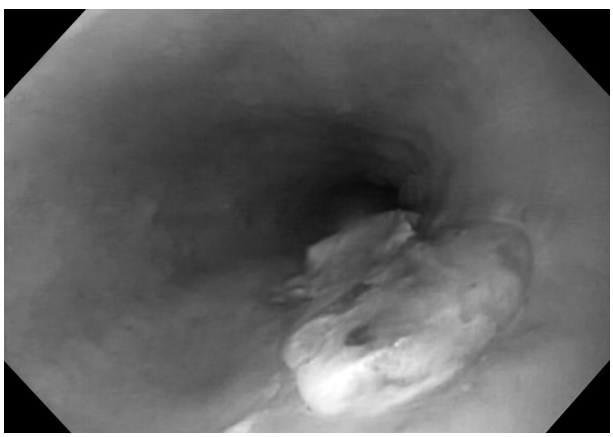

Figure 1. Endoscopy demonstrated an 1×2.5 cm white exudative plaque with an erythematous base and two un-swallowed magnesium pills in the upper esophagus (20 cm from the teeth).

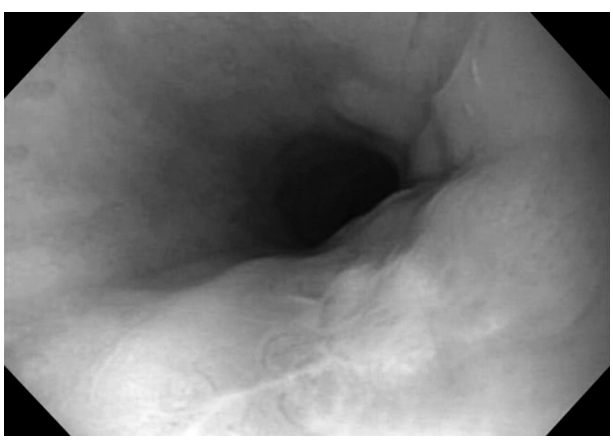

Figure 2. Control endoscopy which was performed 15 days later with healing tissue.

Thereby, the patient's pain was diminished by intravenous proton pump inhibitors (PPIs) in ER, temporarily, she was discharged. However, five days later, she turned back to the hospital with odynophagia. When her medical history was taken deeply, the patient remembered that she had taken two magnesium tablets (approximately 1.5 cm each of the tablets) 2 h before the beginning of her chest pain. Starting from this clinical manifestation, upper endoscopy was performed, and a mucosal biopsy was taken. Endoscopy demonstrated a 1×2.5 cm white exudative plaque with an erythematous base and two un-swallowed magnesium pills in the upper esophagus (20 cm from the teeth), as shown in Figure 1. Endoscopic biopsy was reported as squamous mucosa with basal cell hyperplasia, inflammatory cells compromising eosinophils in both epithelial and subepithelial areas, and evidence of erosion. This biopsy report is compatible with study results suggesting that pathological findings of drug-induced esophagitis and reflux esophagitis are similar.[2] The pills were left in place due to bleeding when we attempted to remove the tablets. She was discharged with dietary modification and long-term PPI therapy. Control endoscopy was performed 15 days later, and completely healing tissue was shown pertinent to her recovered symptoms, as shown in Figure 2.

DISCUSSION

Retrosternal chest pain is the most common complaint of all ER visits. It is known as an initial symptom of many life-threatening diseases including cardiac and non-cardiac etiologies. While retrosternal chest pain provoked by exertion and relieved by rest is roughly described as angina pectoris, non-cardiac causes encompass a broad chest pain characteristic. Physicians primarily focus on life-threatening causes such as acute coronary syndrome (ACS), pulmonary embolism (PE), PTX, pericardial tamponade, aortic dissection, and esophageal perforation in emergency departments. Electrocardiography, cardiac enzyme follow-up, and bedside echocardiography are usually sufficient to diagnose ACS in ER. It is also proven that about 30% of patients undergoing coronary angiography for chest pain have insignificant coronary artery disease.[3] Other causes of acute chest pain can be excluded, carefully.

Esophageal pathologies are considered in approximately 50% of patients with chest pain in whom cardiac etiologies are ruled out.[4] An esophageal ulcer is defined as distinct discontinuation of the margin of the esophageal mucosa. The mucosal damage is often caused by sustained severe esophagitis by gastroesophageal reflux disease. Drug-induced esophagitis due to prolonged interaction with the esophageal mucosa is not a rare cause of the esophageal ulcer. Almost half of the drug-induced esophagitis is caused by antibiotics, such as doxycycline, cloxacillin, or rifampicin. The second most common medication class is non-steroidal anti-inflammatory drugs.[5] Despite drug-induced esophagitis is often seen in the mid-esophagus, the ulcer was in the proximal segment in our case. Many pills are covered by hygroscopic gelatin capsules for easy swelling. These capsules attract and hold water molecules from the surrounding environment and get sticky. This phenomenon results in adhering to esophageal mucosa and delaying pill transit. Consuming the pills with insufficient amounts of water and in a supine position may precipitate irritation of the esophageal mucosa. Avoidance from causative medication and treatment with proton pump inhibitors constitute the optimal treatment strategy.

Characteristics of retrosternal chest pain by esophageal origin are provocation by meal, response to antacids, and association with other esophageal symptoms like heartburn, regurgitation, or dysphagia. Alleviation with nitroglycerin may also help to differentiate non-cardiac chest pain of esophageal origin, but unlike angina pectoris, it is a delayed effect. There are several case reports about misdiagnosed cases as cardiac pain. Schattner et al.[6] presented a patient with many cardiac risk factors whose diagnosis was clarified by taking a careful medical history and revealing dysphagia. Careful endoscopy showed a dissecting intramural esophageal hematoma, and the patient was discharged after adequate treatment.

Esophageal injury from a therapeutic oral magnesium supplement is a less known condition. This case report shows that esophageal injury can occur within hours of magnesium tablet intake. Fortunately, acute thermal and corrosive injury of the esophagus has a favorable prognosis. Four cases of picosulfate with magnesium citrate (PSMC)-related thermal injuries have been reported in Korea. Two of them occurred in the mid esophagus,[7,8] one of them occurred in the upper esophagus[9] and the last one occurred in the stomach.[10] PSMC is a widely used bowel cleansing agent combined with a stimulant laxative (sodium picosulfate) and an osmotic laxative (magnesium citrate) and used for preparation for diagnostic procedures such as colonoscopy. The PSMC powder should be dissolved in 150 mL of water completely and cooled before drinking. If PSMC powder is dissolved in a small amount of water, an exothermic reaction may occur when magnesium oxide reacts with anhydrous citric acid and even a third-degree burn can occur in several seconds.[11] Also, PSMC powder with a small amount of water can produce a strong acidic liquid that can lead to corrosive esophagitis.[12]

Despite the case reports with PSMC powder, there is no report about magnesium pills' rapid esophageal injury. Although these supplements are considered safe, inappropriate usage may lead to severe side effects as in our patient. In addition, misdiagnosis as cardiac pain of these esophageal pathologies could lead to potentially fatal use of anticoagulants or thrombolytic agents. Also, a health provider should take care of raising the quality of patient's life, besides saving their lives.

In conclusion, esophageal pathologies are considered approximately 50% of patients with chest pain in whom cardiac etiologies are ruled out. Our case is interesting with cause, time of occurrence, and location of ulceration. In this case, we want to emphasize the importance of multidisciplinary evaluation of patients with retrosternal pain.

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Data Sharing Statement: The data that support the findings of this study are available from the corresponding author upon reasonable request.

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