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Case of takotsubo cardiomyopathy after surgical treatment of liver hydatid cyst: A case report

Altaş Y *et al.* Takotsubo cardiomyopathy and liver hydatid cyst

Abstract

BACKGROUND

Takotsubo cardiomyopathy, also called apical ballooning syndrome, is a disease that is often triggered by stress factors in postmenopausal women and mimics acute coronary syndrome. The aim of this article is to draw attention to takotsubo cardiomyopathy after surgical treatment of liver hydatid cyst.

CASE SUMMARY

A 50-year-old diabetic and hypertensive female patient was evaluated preoperatively before general surgery for liver hydatid cyst, and no cardiac problems were found. The patient was discharged on the 3 rd postoperative day without any postoperative complications. On postoperative day 5, the patient presented to the emergency department with fever, shortness of breath, chills, and shivering and was hospitalized with the diagnosis of pneumonia. The troponin levels remained high during follow-up. Echocardiography was performed on postoperative day 7, after which the patient was referred to a tertiary center with the diagnosis of non-ST-elevation myocardial infarction due to akinesia in the apical region. Coronary angiography performed at the tertiary center showed normal coronary anatomy, and the patient was diagnosed with takotsubo cardiomyopathy.

CONCLUSION

Takotsubo cardiomyopathy mimicking myocardial infarction without ST segment elevation may develop after surgical treatment of liver hydatid cyst.

Key Words: Takotsubo cardiomyopathy; Liver hydatid cyst; Noncardiac surgery; Coronary angiography; Echocardiography; Case report

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Core Tip: Takotsubo cardiomyopathy is a type of cardiomyopathy triggered by stress. Echocardiography shows akinesia in the apical region and hyperkinesis in other regions. Clinical, electrocardiographic, and laboratory findings mimic acute coronary syndrome. The diagnosis is made by excluding acute coronary syndrome. In our case, cardiomyopathy developed after surgical treatment of liver hydatid cyst.

INTRODUCTION

Takotsubo cardiomyopathy, also referred to as apical ballooning syndrome or broken heart syndrome, is a disease that mimics acute myocardial infarction triggered by stress[1]. Its pathophysiology is thought to include epicardial coronary artery spasm and myocardial dysfunction due to catecholamine discharge[2] . More than 95% of patients are female and mostly postmenopausal[3]. Takotsubo cardiomyopathy was first described by Sato *et al* [4-5] in Japan in 1990. Its name refers to the appearance of the left ventricle on ventriculography, which resembles the vessel used by Japanese fishermen for octopus fishing. In subsequent years, many reports on the disease have been published worldwide. According to the Mayo Clinic diagnostic criteria, takotsubo cardiomyopathy has four diagnostic criteria: (1) Transient regional left ventricular akinesia, hypokinesia, or dyskinesia with or without involvement of the apical region; (2) presence of coronary artery disease; (3) electrocardiogram (ECG) derivations including ST segment change and

negative T wave or significant elevation of cardiac troponins; and (4) presence of pheochromocytoma and myocarditis[6] . Diagnosis of the disease is based on the exclusion of acute coronary syndrome. The symptoms of takotsubo cardiomyopathy are often chest pain, shortness of breath, and sweating. ECG shows ST deviation, negative T wave, QT prolongation, and elevated cardiac biomarkers. Echocardiography may reveal akinesia, hypokinesia, dyskinesia in the apical region, and hyperkinesia in other regions. However, coronary angiography reveals normal coronary anatomy.

CASE PRESENTATION

Chief complaints

A 50-year-old woman presented to our hospital with abdominal distension, nausea, and vomiting for 2 mo.

History of present illness

The patient, who had complaints for 2 mo, was admitted to the general surgery outpatient clinic. Abdominal computed tomography (CT) showed a space-occupying lesion consistent with type II liver hydatid cyst with dissociated germinant membrane in liver segments 8, 7, and 5, which was approximately 12 cm × 11 cm in size. Surgery was recommended (Figure 1). The patient's preoperative electrocardiogram was unremarkable (Figure 2). Losartan and metformin treatment was continued during the surgical period.

History of past illness

The patient had a history of type 2 diabetes mellitus and hypertension.

Personal and family history

There was no distinctive feature.

Physical examination

The patient had no remarkable physical examination findings other than a pale appearance.

Laboratory examinations

There were no abnormalities in the patient's laboratory tests.

Imaging examinations

The patient's abdominal CT examination showed a space-occupying lesion consistent with type II hydatid cyst with a dissociated germinal membrane, approximately 12 cm × 11 cm in size in liver segments 8, 7, and 5.

MULTIDISCIPLINARY EXPERT CONSULTATION

The patient was evaluated by multidisciplinary experts in cardiology, internal medicine and pulmonology in the preoperative period. No serious problems were detected, and the patient was considered suitable for surgery with low risk.

FINAL DIAGNOSIS

Liver hydatid cyst

TREATMENT

The patient underwent surgical removal of the cyst (Figure 3).

OUTCOME AND FOLLOW-UP

The patient did not require inotropic agents and vasopressors during surgery. The patient was discharged on postoperative day 2 without any complication. On postoperative day 4, she was admitted to the emergency room with complaints of fever, shortness of breath, and palpitations. Her C-reactive protein level was 105 mg/L, white blood cell count was 21400/mcL, and troponin I level was 1800 ng/mL. The initial ECG showed no significant features except sinus tachycardia. The ECG taken after rate control was achieved showed

a long QTc duration (467 ms) (Figure 4). Echocardiography performed as a result of the cardiology consultation on these findings showed an akinetic apex and ejection fraction of about 40%. However, we did not record an echo because we initially thought the patient had acute coronary syndrome. The patient was referred to a tertiary center for emergency percutaneous coronary intervention with a diagnosis of non-ST-elevation acute coronary syndrome. Coronary angiography performed at the tertiary center revealed normal coronary anatomy. Takotsubo cardiomyopathy was considered and our patient was followed up. Control echocardiography performed on postoperative day 33 showed complete normalization of left ventricular function. After the patient's left ventricular function improved, only antihypertensive and antidiabetic treatment was continued.

DISCUSSION

Takotsubo cardiomyopathy is thought to develop due to coronary spasm and myocardial dysfunction as a result of noradrenaline discharge following illness, emotional, and physical stress. Since the 1990s, there have been numerous studies on this condition, some of which are surgically relevant. There are case series of takotsubo cardiomyopathy after some infections. Anu Anna George *et al*[7] published a case of Takotsubo cardiomyopathy after influenza infection, a common infection. Achuthanandan S. *et al*[8] also published a case of takotsubo cardiomyopathy with global hypokinesia after covid-19 infection in a young female patient. Izumi Y [9] reported a case of development of the syndrome after drug abuse. In addition, Jalan P *et al*[10] reported a case after a migraine attack.

Some of these cases developed after cardiac valve surgery. Zaprin *et al* [11] published a case of takotsubo cardiomyopathy developing after aortic and mitral valve replacement. Some cases develop in the preoperative period. Rodrigues *et al* [12] published a case of takotsubo cardiomyopathy mimicking ST-elevation myocardial infarction that developed in the preoperative period after general anesthesia. There are also cases in the literature of development after liver transplantation [13-15]. Bhojraj *et al*[16] published a case of takotsubo cardiomyopathy developing after vaginal hysterectomy. In contrast to

takotsubo cardiomyopathy cases, which are frequently seen in the postmenopausal period, Kim *et al*[17] published a case that developed after cesarean section. Our case developed takotsubo cardiomyopathy after surgery for liver hydatid cyst, which is considered postoperative noncardiac surgery. What makes our case different is that a case of takotsubo cardiomyopathy after liver hydatid cyst surgery, which has not been encountered in the literature before.

CONCLUSION

Our patient was diagnosed *via* interdisciplinary coordination. Pneumonia was initially considered according to physical examination and laboratory findings. Subsequently, postoperative non-ST elevation myocardial infarction was considered according to echocardiography and elevated cardiac biomarker findings; however, coronary angiography showed normal coronary anatomy. A diagnosis of takotsubo cardiomyopathy was made according to Mayo Clinic diagnostic criteria. To the best of our knowledge, this is the first reported case of takotsubo cardiomyopathy after surgical treatment of liver hydatid cyst. Additional studies on takotsubo cardiomyopathy developing after noncardiac surgery are needed.

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