Takotsubo Cardiomyopathy Occurring in the Postoperative Period

Süleyman Deniz, Ömer Bakal, Gökhan İnangil, Hüseyin Şen, Sezai Özkan

Department of Anaesthesiology and Reanimation, Gülhane Military Medical Academy Haydarpaşa Training Hospital, İstanbul, Turkey

Takotsubo cardiomyopathy simulates acute myocardial infarction, and it is characterised by reversible left ventricular failure. A case of Takotsubo cardiomyopathy diagnosed after emergency angiography performed in a patient with evidence of acute myocardial infarction in the postoperative period will be described in this report. Transurethral resection of a bladder tumour (TUR-BT) was performed in a 92-year-old male patient by the urology clinic. The patient was transferred to the post-anaesthesia care unit after the operation. An echocardiography was performed because of the sudden onset of dyspnoea, tachycardia (140-150 beats per minute, rhythm-atrial fibrillation) and ST-segment elevation on electrocardiography (ECG) at the first postoperative hour, and midapical dyskinesia was detected at the patient. An immediate angiography was performed due to suspicion of acute coronary syndrome. Patent coronary arteries and temporary aneurysmatic dilatation of the apex of the heart were revealed by angiography. As a result of these findings, the patient was diagnosed with Takotsubo cardiomyopathy by the cardiology service. The patient was discharged uneventfully following 10 days in the intensive care unit. Aneurysm of the apex of the left ventricle and normal anatomy of the coronary arteries in the angiography have diagnostic value for Takotsubo cardiomyopathy. Diuretics (furosemide) and beta-blockers (metoprolol) are commonly used for the treatment of Takotsubo cardiomyopathy. Even though Takotsubo cardiomyopathy is a rare and benign disease, it should be kept in mind in patients suspected for acute myocardial infarction in the postoperative period.

Key Words: Anaesthesia, Takotsubo cardiomyopathy, acute myocardial infarction

Introduction

Takotsubo cardiomyopathy develops in association with catecholamine discharge after acute stress or coronary artery spasm (1-5). It stimulates acute myocardial infarction and is characterised by reversible left ventricular failure (1-5).

The name of the disease was coined on the basis of similarity between the appearance in systole on ventriculography and Takotsubo (a kind of octopus trap in Japan) (4). Stress-induced cardiomyopathy and transient left ventricular apical ballooning syndrome are other names used for this disease (4). It is classified among cardiomyopathies by the American Heart Association (6).

Although this disease was reported in some studies before 1990, Sato et al. (5) from Japan first defined the term of takotsubo cardiomyopathy.

Takotsubo cardiomyopathy constitutes 1-3% of suspicious acute coronary syndromes. It is seen in women at a rate of 90%. The mean age of patients is 58-75 years (4, 7).

The most common symptoms of the disease are chest pain and dyspnoea (1-5). Changes in the electrocardiography (ECG), especially abnormally high levels of ST and negative T, are encountered frequently (4).

In this case report, a patient with evidence of postoperative myocardial infarction who was diagnosed with takotsubo cardiomyopathy after having undergone emergency angiography is presented.

Case Presentation

Before reporting the data of the 92-year-old male patient, his written informed consent was obtained. Transurethral resection of a bladder tumour was planned by the urology clinic. His preoperative evaluation revealed that he had chronic renal

failure and hypertension, and he was evaluated to be American Society of Anesthesiologists (ASA) III. His preoperative ECG was normal.

Following ECG, SPO₂ and non-invasive arterial monitoring, spinal anaesthesia was applied to the patient, who did not have a history of coronary artery disease, by giving 12, 5 mg heavy bupivacaine with a 25 gauge spinal needle through the L4-5 interspace. No problem was encountered during the operation that lasted for 60 minutes. The patient was transferred to the post-anaesthesia care unit after the operation. Cardiology consultation was requested for the patient because of the sudden onset of dyspnoea, tachycardia (140–150 beats per min, AF rhythm) and ST-segment elevation on ECG at the first post-operative hour. A blood sample was sent for evaluating cardiac enzymes, and echocardiography was planned for the patient. Midapical dyskinesia was detected in the echocardiograph.

The patient underwent an immediate angiography because of a suspicion of acute coronary syndrome. Angiography revealed patent coronary arteries and temporary aneurysmatic dilatation in the apex of the heart (Figure 1). After this procedure, the patient was transferred to the intensive care unit for follow-up and treatment. Cardiac enzymes were found to be within normal intervals. The patient was diagnosed with takotsubo cardiomyopathy in the evaluation conducted by the cardiology service. The patient was uneventfully discharged 10 days later.

Discussion

In takotsubo cardiomyopathy, symptoms and transient apical wall motions typically disappear in days or 1-2 weeks (1-4). It has a good prognosis, and the rate of mortality at hospital was reported to be 0-8% (4).

It was reported that the symptoms of this disease are felt more often at the morning hours on Mondays (1, 4) during summer, the reason of which has been explained by excessive secretion of catecholamine discharge due to stress. It is stated that this discharge is more apparent especially in the mornings of Mondays during summer (1).

This disease with a good prognosis, which is thought to develop because of sudden stress and catecholamine, should be differentiated from the diseases with high morbidity and mortality, including acute myocardial infarction, myocarditis, aortic dissection and cardiac tamponade, because their follow-up and treatment periods differ (1-7). Emergency angiography is an effective method for differential diagnosis. In patients suspected to have postoperative acute myocardial infarction, emergency angiography is used as a routine diagnostic and treatment method at present (1, 3, 7). Left ventricular apical ballooning and normal coronary arteries in angiography are diagnostically valuable for takotsubo cardiomyopathy (4). For establishing a final diagnosis, diseases leading to catecholamine discharge such as pheochromocytoma, head trauma, stroke and palsy should be ruled out (1, 2, 8).

Psychiatric disorders (posttraumatic stress disorder, depressive disorder, etc.), neuroleptic therapy, sympathetic nervous system disorder, decrease in heart rate variability, changes in platelet function and increase in pro-inflammatory processes, radiotherapy for cancer, pain attacks and Alzheimer's disease increase the possibility of the development of takotsubo cardiomyopathy (8-10).

Although takotsubo cardiomyopathy displays a good prognosis, cardiac rupture, ventricular arrhythmia and apical thrombus are rare but fatal complications (4). Therefore, patients with this disease should be followed-up in the intensive care unit for a while. They should be followed-up with echocardiography, and these possible complications should be tried to be eliminated through intra-aortic balloon pump, antithrombotic medications and beta blockers (4). The treatment of takotsubo cardiomyopathy is usually carried out with a diuretic (furosemide) and beta blockers (metoprolol) (1-7, 10). Antithrombotic therapy and reperfusion application are generally unnecessary for this patient group (7). Other treatment agents that can be used include angiotensin converting enzyme inhibitors, angiotensin II type 1 receptor blockers, specific aldosterone antagonist (Spironolactone) and anxiolytics (4, 10). If necessary, positive pressure ventilation for respiration support and opioid therapy in case of pain can be used (10).

Smoking, excessive consumption of alcohol, high levels of anxiety and hyperlipidaemia increase the rate of mortality in this patient group (8).

Conclusion

Although takotsubo cardiomyopathy is a rare disease with a good prognosis, it should be kept in mind for patients suspected of having postoperative acute myocardial infarction and it should be observed for follow-up and treatment under intensive care conditions.

Figure 1. Temporary aneurysmatic dilatation in the apex of the heart on ventriculography (takotsubo appearance)

Informed Consent: Written informed consent was obtained from patient who participated in this case.

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References

1. Song BG, Oh JH, Kim HJ, Kim SH, Chung SM, Lee M, et al. Chronobiological variation in the occurrence of Tako-tsubo cardiomyopathy: experiences of two tertiary cardiovascular centers. *Heart Lung* 2013; 42: 40-7. [\[CrossRef\]](#)
2. Sharkey SW, Windenburg DC, Lesser JR, Maron MS, Hauser RG, Lesser JN, et al. Natural history and expansive clinical profile of stress (tako-tsubo) cardiomyopathy. *J Am Coll Cardiol* 2010; 55: 333-41. [\[CrossRef\]](#)
3. Gianni M, Dentali F, Grandi AM, Sumner G, Hiralal R, Lonn E. Apical ballooning syndrome or takotsubo cardiomyopathy: a systematic review. *Eur Heart J* 2006; 27: 1523-9. [\[CrossRef\]](#)
4. Kurisu S, Kihara Y. Tako-tsubo cardiomyopathy: clinical presentation and underlying mechanism. *J Cardiol* 2012; 60: 429-37. [\[CrossRef\]](#)
5. Sato H, Tateishi H, Dote K, Uchida T, Ishihara M. Tako-tsubo-like left ventricular dysfunction due to multivessel coronary spasm. In: Kodama K, Haze K, Hori M, editors. *Clinical aspect of myocardial injury: from ischemia to heart failure*. Tokyo: Kagakuhyoronsha Publishing Co.; 1990.p.56-64.
6. Maron BJ, Towbin JA, Thiene G, Antzelevitch C, Corrado D, Arnett D, et al. Contemporary definitions and classification of the cardiomyopathies: an American Heart Association Scientific Statement from the Council on Clinical Cardiology, Heart Failure and Transplantation Committee; Quality of Care and Outcomes Research and Functional Genomics and Translational Biology Interdisciplinary Working Groups; and Council on Epidemiology and Prevention. *Circulation* 2006; 113: 1807-16. [\[CrossRef\]](#)
7. Santoro F, Di Biase M, Brunetti ND. Urinary sepsis associated with Takotsubo cardiomyopathy. *Int J Urol* 2014; 21: 432-3. [\[CrossRef\]](#)
8. Romanò M, Zorzoli F, Bertona R, Villani R. Takotsubo cardiomyopathy as an early complication of drug-induced suicide attempt. *Case Rep Med* 2013; 2013: 946378.
9. Southwick SM, Krystal JH, Morgan CA, Johnson D, Nagy LM, Nicolaou A, et al. Abnormal noradrenergic function in posttraumatic stress disorder. *Arch Gen Psychiatry* 1993; 50: 266-74. [\[CrossRef\]](#)
10. Singh SB, Harle IA. Takotsubo cardiomyopathy secondary in part to cancer-related pain crisis: a case report. *J Pain Symptom Manage* 2014; 48: 137-42. [\[CrossRef\]](#)