



BROKEN HEART SYNDROME: UNDERSTANDING TAKOTSUBO CARDIOMYOPATHY

A comprehensive narrative review of clinical insights, pathophysiology and diagnostic challenges

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Abstract

Takotsubo cardiomyopathy is temporary and reversible heart condition where heart muscle suddenly become too weak often leading to the dilation of left ventricles into a balloon shape. "Takotsubo" is a Japanese word where tako=octopus and tsubo=pot, a traditional octopus fishing vessel with round bottom and narrow neck resembling enlarged left ventricle with normal upper part of heart. This reviews current understanding of this cardiomyopathy and examines etiology, pathophysiology, case presentation along with discussion, diagnostic criteria, echocardiographic findings, treatment methods and prognosis in the patients. Takotsubo cardiomyopathy highlights upon interaction between emotional stress and heart function. It often goes underdiagnosed or misdiagnosed, continued research is needed for better understanding and treatment.

Introduction

Takotsubo cardiomyopathy is also known as:

1. broken heart syndrome (as it is caused due to emotional stress, anxiety)
2. apical balloon syndrome (causes ventricle to take shape of a balloon)

A condition that predominantly seen in postmenopausal women. It is almost indistinguishable from acute coronary syndrome and can lead to adverse outcomes if not treated



early. It needs much clinical awareness for proper management, this article aims to present all key features of Takotsubo cardiomyopathy .

Etiology

Emotional trigger such as anxiety, sudden shock ,fear, chronic stress and physical stress like trauma, surgery, medical illness are most common causes of Takotsubo cardiomyopathy besides these neurological events including subarachnoid haemorrhage, stroke, seizures and autonomic dysfunction such as Guillains-Barre syndrome are also considered as triggers leading to excessive catecholamine release .

Studying more number of cases in postmenopausal women it is quite obvious that endocrine factors like low estrogen level and condition of pheochromocytoma also highly contribute to etiology. Certain sympathomimetic drugs and some antidepressants are potential triggers.

Pathophysiology

The exact mechanism of Takotsubo cardiomyopathy is still not completely understood though current evidence support sudden excessive level of stress hormone (catecholamines) at such level that they overstimulate heart cells-beta receptors leading to calcium overload in cell causing impaired contractions the tip of apex has more beta receptors making it sensitive to adrenaline and most likely to become weak and dilated possible mechanism of these include myocardial stunning, microvascular dysfunction and metabolic derangements in heart. The temporary dysfunction results in reduced pumping ability and abnormal contraction pattern without any permanent structural damage in most cases.

Case presentation

A 61 year old women attended her local accident and emergency department with severe central chest pain.After being chased by two large terrier dogs. The pain was not relieved by nitroglycerine spray given in the ambulance . An electrocardiogram showed an anterolateral ST segment depression, with elevated troponin T of 1.25µg/l. she had no cardiovascular risk factor. Non-ST elevation myocardial infarction was diagnosed, and the patient was treated accordingly.

Coronary angiography showed normal coronary arteries, but the left ventriculogram showed a large area of apical hypokinesis with moderate impairment of left ventricular systolic function. The patient was readmitted several weeks later with further chest pain. An electrocardiogram showed no new changes with no rise in cardiac troponin. An electrocardiogram showed left ventricular systolic function had almost return to normal.

Discussion

The case is consistent with literature showcasing postmenopausal women with symptoms that are almost indistinguishable from that of myocardial infarction like severe chest pain , dyspnea and irregular heartbeat along with elevated troponin level due to which it is misdiagnosed as NSTEMI it is angiography report that tells us otherwise. Echocardiography result of Apical hypokinesis with moderate impairment of left ventricle systolic function redirects diagnosis to Takotsubo cardiomyopathy, the trigger here being fear caused by terrier dogs



Diagnostic criteria

On testing we find electrocardiographic changes resembling heart attack (ST elevation), elevated cardiac enzymes like troponin. Takotsubo cardiomyopathy is best diagnosed with coronary angiography, which rules out coronary artery blockage and absence of Acute coronary syndrome. Echocardiography shows wall motion abnormalities demonstrating left ventricular systolic dysfunction and apical hypokinesis, further cardiac MRI aid in confirming diagnosis.

Treatment

It includes supportive care like aspirin anticoagulants like heparin are initially given until myocardial infarction is ruled out, if left ventricular ejection fraction is less than 40% non selective beta-blocker like carvedilol (to reduce heart rate and workload) along with Angiotensin-converting enzyme inhibitor or angiotensin II receptor blocking agent is given. Additionally Diuretics if pulmonary edema is present and oxygen if oxygen saturation is low.

For severe cases vasopressors for cardiogenic shock and mechanical circulatory support in refractory shock along with anticoagulation if left ventricle has thrombus formation

Prognosis

Prognosis is very good, with about 95% of patient making full recovery. recovery is seen in most patients within weeks-months, the left ventricle usually returns to normal function. The recurrence rate being quite low around 5-10%. Despite a generally good prognosis under conservative treatment, complication like arrhythmias and heart failure are reported in 17.7% of all cases in the literature. Therefore intensive treatment and monitoring are necessary.

Emotional recovery is just as important as physical recovery the patient is advised to rest and avoid emotional stress, therapy, meditation, breathing techniques and avoiding known triggers.

Conclusion

Takotsubo cardiomyopathy highlights how strongly psychological and emotional stress can affect physical health of a being. It reshapes the common idea that heart diseases are only about lifestyle or blockages but also about mental wellbeing of an individual and how it can help human body recover itself if taken care of. The number of postmenopausal women affected with this cardiomyopathy showcases the role of estrogen on cardiovascular by regulating release of catecholamines. We often use the term "broken heart" as metaphor but it can turn into reality if the emotional and mental health is being compromised so much so that it actually mimics a severe heart condition like myocardial infarction and the fact that it is in fact misdiagnosed as myocardial infarction reflects lack of awareness among both doctors and patients. Takotsubo cardiomyopathy reminds us heart is not just a pump but also reflection of our emotional world.

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