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Takotsubo Cardiomyopathy

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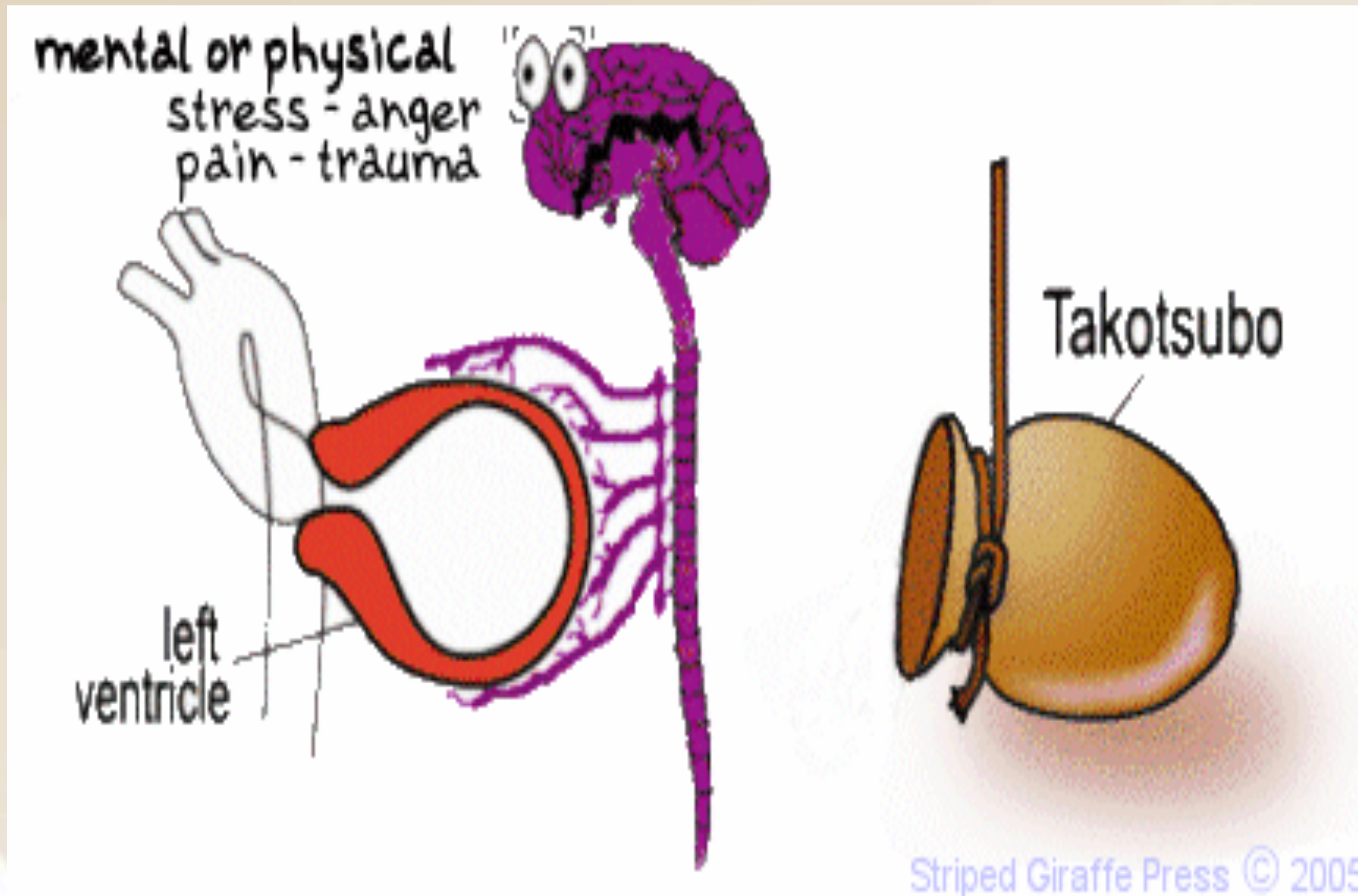


Introduction

Takotsubo cardiomyopathy (TCM) is a reversible form of non-ischemic cardiomyopathy. Patients typically present with symptoms of acute coronary syndrome including chest pain, shortness of breath, elevated cardiac biomarkers and ST elevation. As a result, patients are emergently taken to the coronary catheterization lab for angiography of the coronary arteries. During the coronary angiography, a left ventricular dysfunction with apical ballooning is noted along with the absence of coronary artery disease. The base of the left ventricle remains unaffected and results in the classic ballooning appearance. Takotsubo was first described in Japan in 1990 because the apical dysfunction by angiography resembled a Japanese octopus trap (Peters, George, & Irimpen, 2015). The trap is a pot with a narrow neck and a round bottom (Milinis & Fisher, 2012). Takotsubo is also referred to as broken heart syndrome or stress-induced cardiomyopathy. It is commonly triggered or preceded by intense emotional or physical stress with an increased incidence in women (Pelliccia et al., 2014). It is estimated that 90% of all cases occur in postmenopausal women (Peters, George, & Irimpen, 2015). TCM is typically in relation to emotional stress in women and physical stressors in men.

Pathophysiology

Although the exact mechanism of TCM is still controversial and multiple theories have been researched, it is becoming clear that the process is mediated by an excess of circulating catecholamine (Peters, George, & Irimpen, 2015). Sympathetic excitation through the hypothalamus triggers the release of norepinephrine and epinephrine (Yoshikawa, 2015). Norepinephrine and epinephrine levels are 2-3 times higher in TCM than those having an acute myocardial infarction (Brown, Trohman & Madias, 2015). The catecholamine excess causes myocardial toxicity and/or activation of α - and β -adrenergic receptors leading to microvascular dysfunction or coronary spasm (Brown, Trohman & Madias, 2015). Myocardial biopsies have found contraction band necrosis, infiltration of inflammatory cells, and localized fibrosis, all directly caused by catecholamine toxicity (Brown, Trohman & Madias, 2015).



Signs and Symptoms

- Chest Pain
- Dyspnea
- Anterior wall ST elevation
- Mildly elevated Troponin 1
- Cardiac murmurs and pulmonary crackles due to acute heart failure
- Recent acute physical or emotional stress

Can you really die from a broken HEART?

Broken Heart Syndrome

Criteria for Diagnosis

1. Transient hypokinesis, akinesis, or dyskinesis of the left ventricle mid segments with or without apical involvement; the regional wall motion abnormalities extent beyond a single epicardial vascular distribution; a stressful trigger is often, but not always present
2. Absence of obstructive coronary disease or angiographic evidence of acute plaque rupture
3. New electrocardiographic abnormalities (either ST-segment elevation and/or T-wave inversion) or modest elevation in cardiac troponin
4. Absence of pheochromocytoma or myocarditis

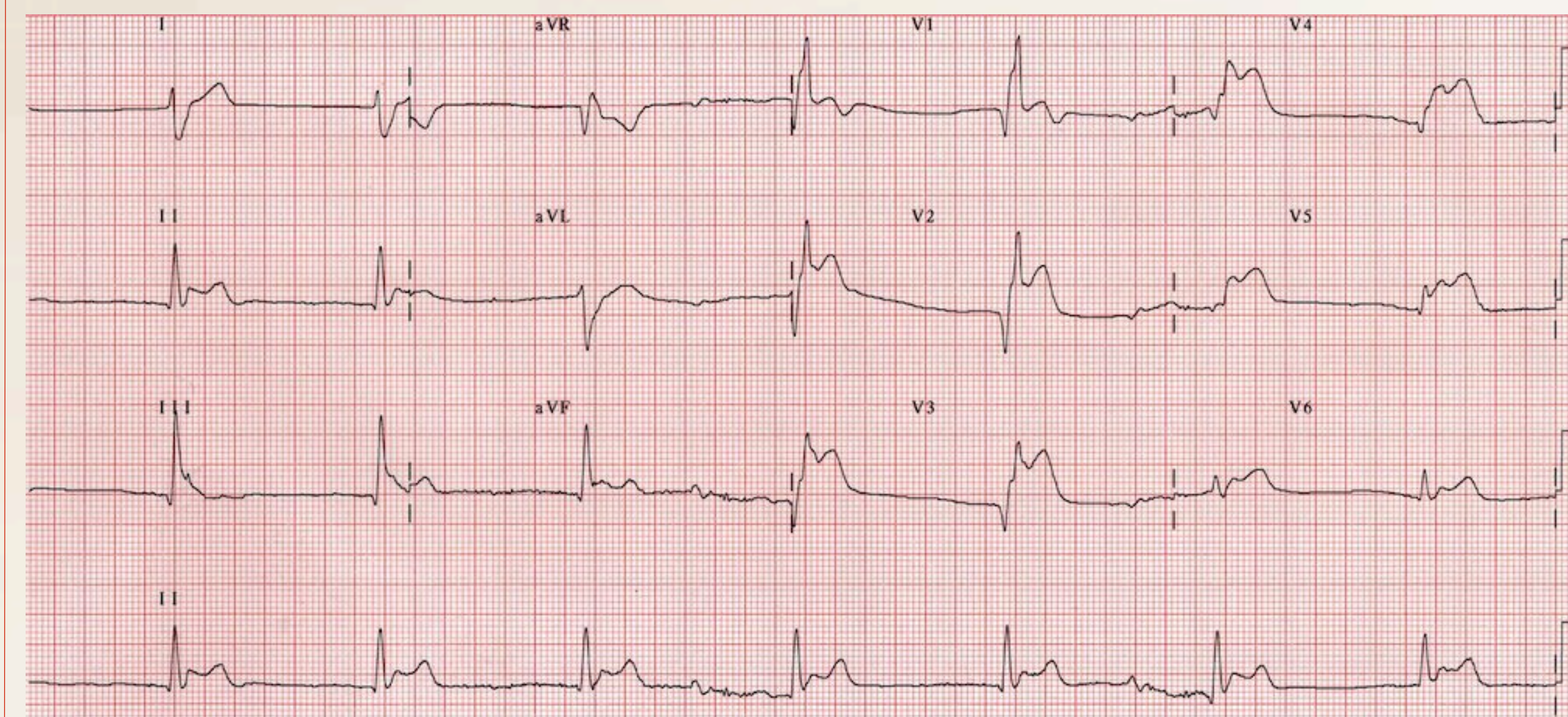
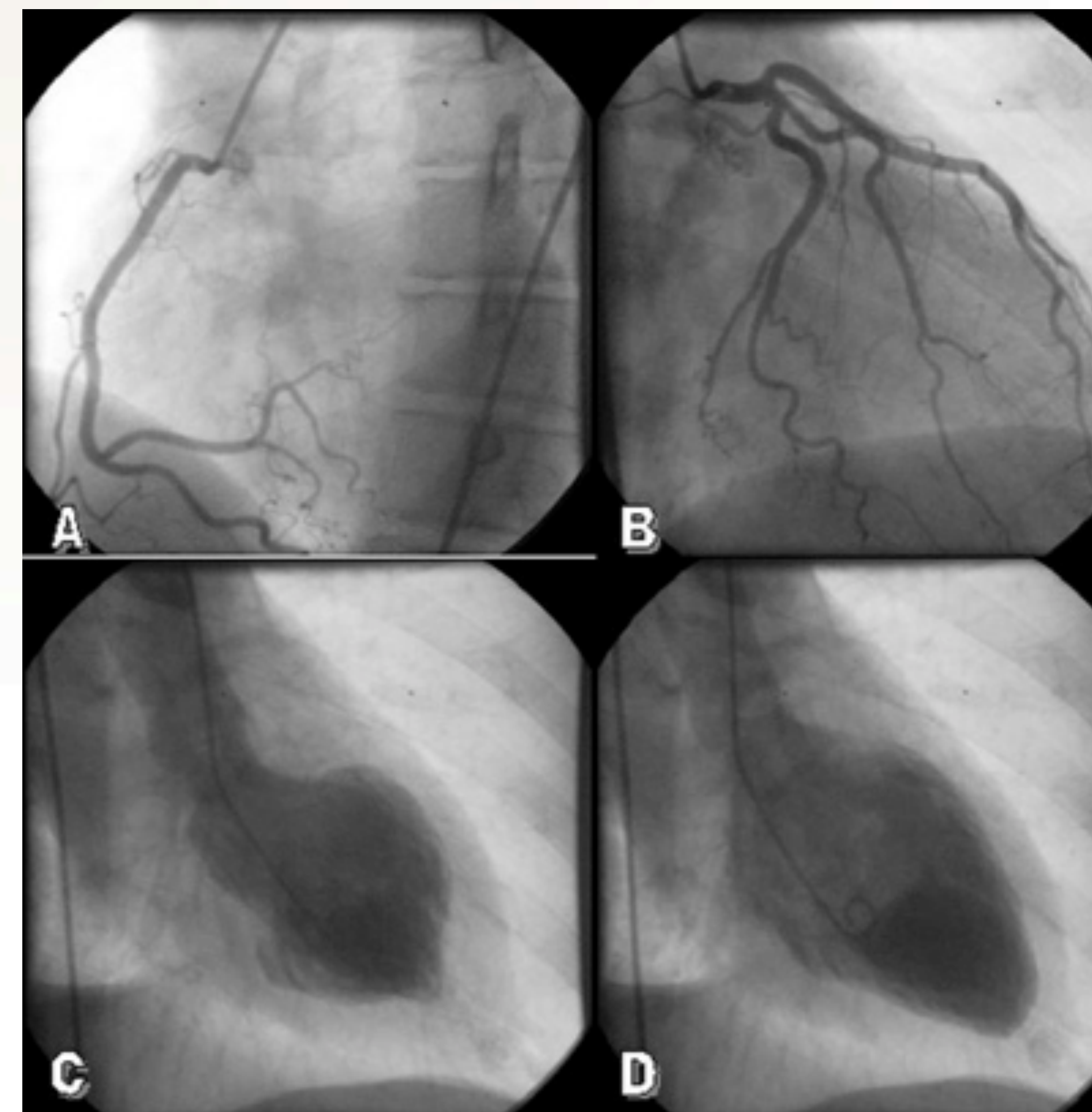


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Images A and B are normal angiographic coronary arteries, while image C is a left ventricular angiogram of the heart in systole and D in diastole. Image copyright www.revespcardiol.org

Medical Management

- Due to the lack of knowledge regarding the pathophysiology, there are no specific recommendations for optimal treatment.
- Beta-blockers are typically administered due to the excess catecholamine's in the body.
- The traditional treatment of left ventricular systolic dysfunction is also used, consisting of angiotensin-converting enzyme inhibitors and diuretics.
- Anticoagulants may also be utilized to prevent thrombus formation during the acute phase.
- Patients who are hypotensive due to left ventricular dysfunction may benefit from an intra-aortic balloon pump while inotropes should be avoided.

Potential Complications

- Left ventricular failure
- Cardiac arrhythmias
- Intra-cardiac thrombus
- Cardiac rupture

Nursing Care

- Dysrhythmia monitoring
- Pain management
- Blood pressure control
- Anxiety reduction
- Patient education regarding stress management and the importance of support systems
- Promote daily physical activity and adequate rest

Patient Outcomes

"TCM is generally considered to have an excellent outcome with almost complete recovery seen in 96% of patients (Milinis & Fisher 2016). Most patients experience a complete recovery within as little as a week to a few months (Padilla, Paltoo, Edsall, & Hettling, 2014). The greatest risk is with the initial onset, long term survival is that of the general population (Milinis & Fisher 2016).

Conclusions

Takotsubo cardiomyopathy should be considered as a possible differential diagnosis for patients presenting with symptoms of acute coronary syndrome following any variable form of acute stress especially in postmenopausal women. Although the exact pathophysiology remains unclear, excess catecholamine's plays an important role.

References

Andrade, A. A., & Stainback, R. F. (2014). Takotsubo cardiomyopathy. *Texas Heart Institute Journal*, 41(3), 299-303. doi:10.14503/THIJ-14-4108

Brown, K. H., Trohman, R. G., & Madias, C. (2015). Arrhythmias in Takotsubo Cardiomyopathy. *Cardiac Electrophysiology Clinics*, 7(Arrhythmias in Cardiomyopathies), 331-340. doi:10.1016/j.ccep.2015.03.015

Inngs, R., & Christensen, M. (2015). Takotsubo cardiomyopathy: Considerations for nursing practice. *Singapore Nursing Journal*, 42(2), 17-22. 6p.

Kazakauskaitė, E., Jankauskas, A., Lapinskas, T., Ordienė, R., & Ereminienė, E. (2014). Review: Takotsubo cardiomyopathy: The challenging diagnosis in clinical routine. *Medicina*, 50(1-7). doi: 10.1016/j.medici.2014.05.009

Kristijonas, M., & Michael, F. (2012). Takotsubo cardiomyopathy: Pathophysiology and treatment. *Postgraduate Medical Journal*, 88(1043), 530-538.

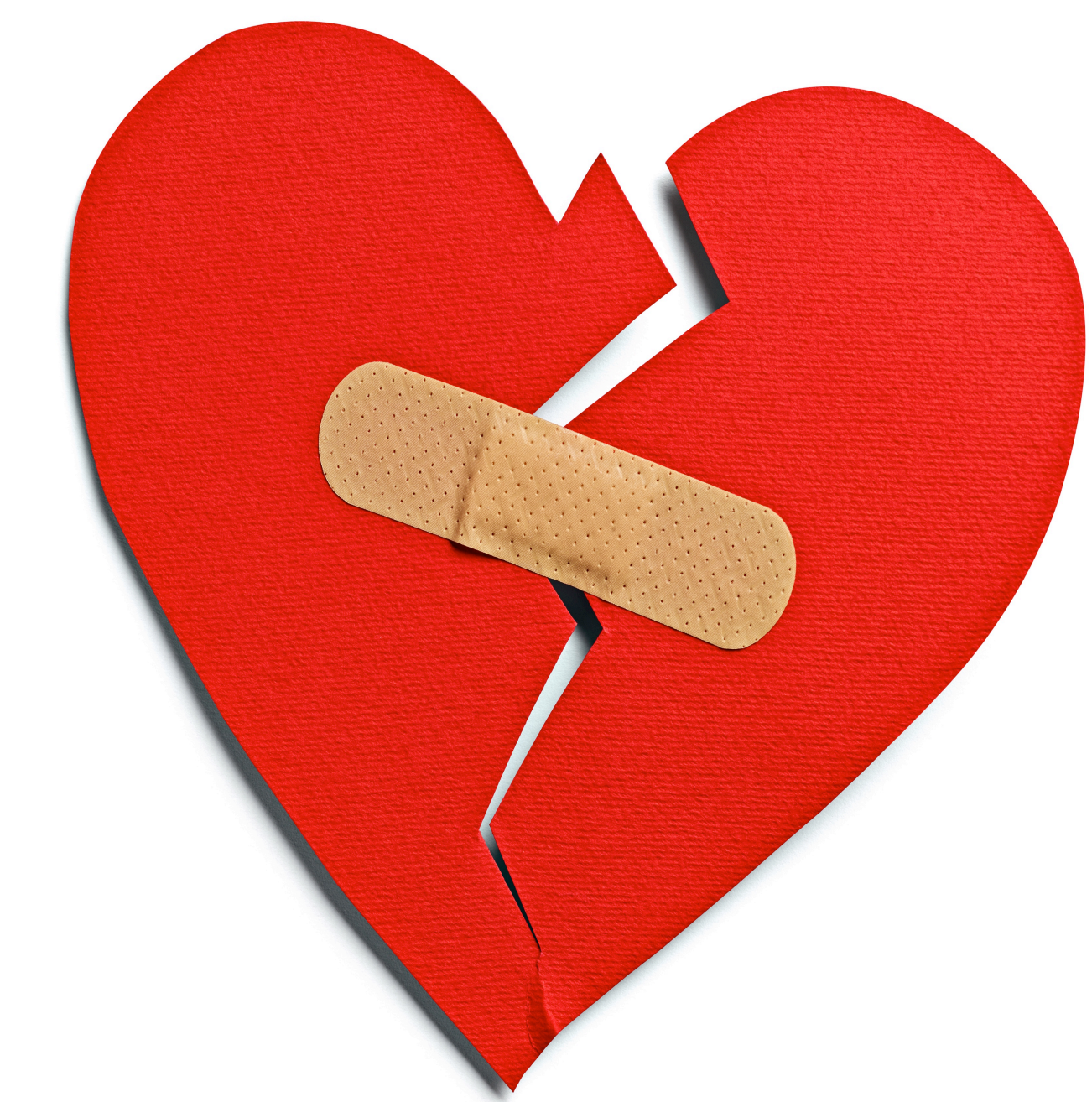
Padilla, H., Paltoo, B., Edsall, R., & Hettling, N. (2014). Recognizing and treating Takotsubo cardiomyopathy. *Nursing*, 44(8), 50-54. doi: 10.1097/01.NURSE.0000450780.57483.17

Pelliccia, F., Greco, C., Vitale, C., Rosano, G., Gaudio, C., & Kaski, J. C. (2014). Takotsubo syndrome (stress cardiomyopathy): An intriguing clinical condition in search of its identity. *American Journal of Medicine*, 127(8), 699-704. doi: 10.1016/j.amjmed.2014.04.004

Peters, M. N., George, P., & Irimpen, A. M. (2015). The broken heart syndrome: Takotsubo cardiomyopathy. *Trends in Cardiovascular Medicine*, 25, 351-357. doi:10.1016/j.tcm.2014.11.005

Redfors, B., Shao, Y., Ali, A., & Omerovic, E. (2014). Review: Current hypotheses regarding the pathophysiology behind the takotsubo syndrome. *International Journal of Cardiology*, 177, 771-779. doi:10.1016/j.ijcard.2014.10.156

Yoshikawa, T. (2015). Takotsubo cardiomyopathy, a new concept of cardiomyopathy: Clinical features and pathophysiology. *International Journal of Cardiology*, 297. doi:10.1016/j.ijcard.2014.12.116



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The image in the left represents the apical ballooning and the right is the octopus trap. Image copyright www.lifeinthefastlane.com