

Cardiogenic shock as the initial manifestation of takotsubo syndrome

Choque cardiogénico como manifestación inicial de síndrome de takotsubo

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Case presentation

A 75-year-old female with a lymphoma record, diabetes mellitus 2, and hypertension, was hospitalized in another institution with a diagnosis of urosepsis; she required vasopressor treatment and a 3rd generation cephalosporin 2 weeks ago with a partial clinical improvement; but two weeks later she returned to the same hospital with dyspnea and peripheral edema. At the physical examination highlights general rales and peripheral edema, an electrocardiogram (ECG) showed sinus rhythm with ST-segment elevation in V2-V6, DI, and aVL. The troponin I level was 620 ng per liter on a high-sensitivity assay, and she was referred to our institute. Upon her arrival to the emergency department at our institution, she had a Glasgow score of 10 points, respiratory distress and medium blood pressure <65 mmHg. The ECG persists with a ST-segment elevation in V2-V6, DI, and aVL (Fig. 1). The patient was intubated and required invasive mechanical ventilation, we started anti-ischemic treatment and vasopressor. In the context of ST-segment elevation myocardial infarction and cardiogenic shock, she was transferred to the cardiac catheterization laboratory, where it was reported the absence of injuries in the right coronary, circumflex, and anterior descending arteries (Fig. 2). With anterior and inferior akinesia, and apical dyskinesia,

suggestive of Takotsubo cardiomyopathy (Fig. 3). After that, she was transferred to the coronary care unit where the diagnosis of cardiogenic shock was integrated. We initiated treatment with an inodilator (levosimendan) and inserted an intra-aortic balloon pump (IABP) as a ventricular-assistant device. A transthoracic echocardiogram was performed, reporting basal hypokinesia, apical akinesia. LVEF 12%, without a dynamic obstruction of the left ventricular outflow tract and a lung ultrasound with a B-profile. Urine and blood culture were negative; she presented a clinical improvement, so the vasopressor and inodilator were retired and started deflating the IABP. We performed another echocardiogram obtaining a LVEF 27%. As she presented clinical improvement as the days went by, we removed the ventricular assistant device. Unfortunately, in a sudden way, the patient started with ventricular tachycardia requiring pharmacological, electrical defibrillation, and resuscitating maneuvers without a response.

Discussion

The patient had three of four criteria according to the Mayo Clinic diagnostic criteria for takotsubo syndrome and 38 points of InterTAK diagnostic score. Cardiogenic shock as a presentation of takotsubo syndrome is not

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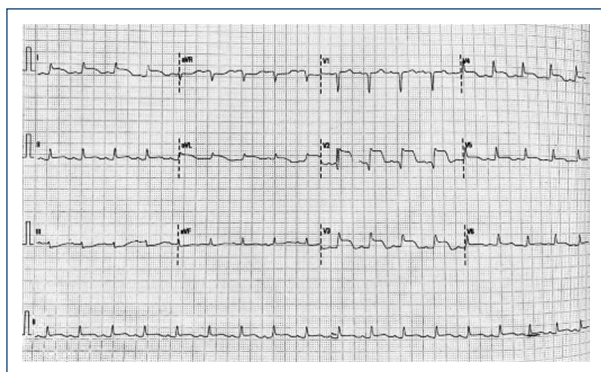


Figure 1. Electrocardiogram. ST segment elevation in V2-V6, DI and aVL.

common, in this case, female gender and a decreased LVEF are well-known risk factors associated with takotsubo syndrome and its complications. In addition, diabetes mellitus presents only in 12% of patients and is associated as a protective factor due to slow release of catecholamines¹. Some prospective studies enhance that 50% of patients developed complications but only 2-3% died during the acute phase; being our case report part of this statistic². In this context, patients that receive cardiac mechanical support (IABP, Impella, or extracorporeal membrane oxygenation [ECMO]) have a lower in-hospital mortality rate (12.8%) than those without cardiac mechanical support (28.3%), making this intervention a key factor in the evolution of the patients³. It is important to mention that IABP is the predominantly used mechanical support device all over the world. However, it is also established and supported by the Heart Failure Association of the European Society of Cardiology that in case of having the source and according to the clinical evolution of the patient progression of mechanical support to Impella or V-A ECMO is indicated to avoid refractory cardiogenic shock^{4,5}. Early implantation of mechanical devices should be considered as a bridge to recovery therapy to reduce the high mortality rate during the acute phase⁶. Identifying more predictor data of shock valuable for an appropriate algorithm of treatment strategies are imperative^{6,7}. According to the results of the international registry of takotsubo syndrome, identifying variables such as apical takotsubo syndrome, physical stress, lower LVEF, and atrial fibrillation should be components to include in a primary risk stratification model³.

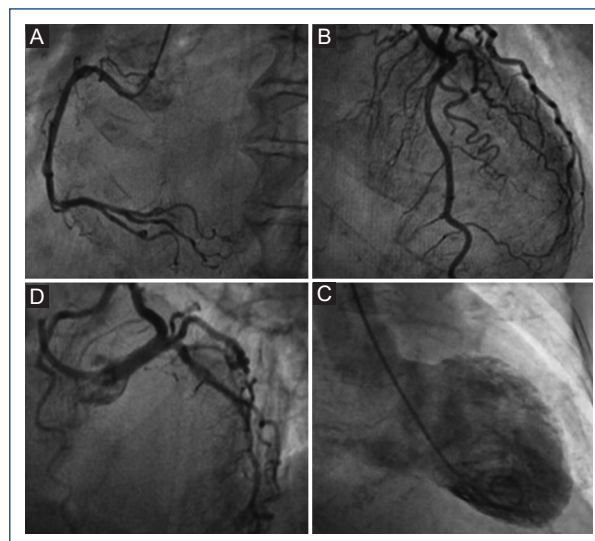


Figure 2. Coronary angiography; **A:** right coronary artery without obstruction. **B:** left anterior descending artery without obstruction. **C:** circumflex coronary artery without obstruction. **D:** apical ballooning pattern in coronary angiography, Left ventricular apical dyskinesia.

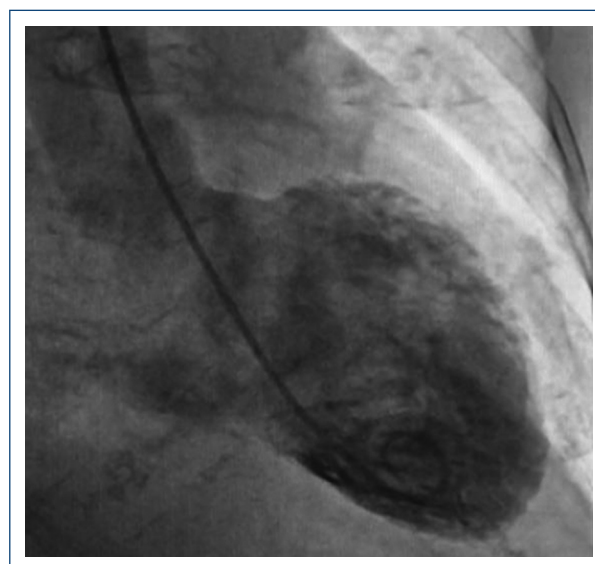


Figure 3. Ventriculography: transient left ventricular apical ballooning.

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Conflicts of interest

The authors declare that they have no conflicts of interest.

Ethical disclosures

Protection of human and animal subjects. The authors declare that no experiments were performed on humans or animals for this study.

Confidentiality of data. The authors declare that they have followed the protocols of their work center on the publication of patient data.

Right to privacy and informed consent. The authors have obtained the written informed consent of the

patients or subjects mentioned in the article. The corresponding author is in possession of this document.

References

1. Madias JE. Low prevalence of diabetes mellitus in patients with Takotsubo syndrome: a plausible "protective" effect with pathophysiologic connotations. *Eur Heart J Acute Cardiovasc Care*. 2016;5:164-70.
2. Schneider B, Athanasiadis A, Schwab J, Pistner W, Gottwald U, Schoeller R, et al. Complications in the clinical course of tako-tsubo cardiomyopathy. *Int J Cardiol* 2014;176:199-205.
3. Di Vece D, Citro R, Cammann VL, Kato K, Gili S, Szawan KA, et al. Outcomes associated with cardiogenic shock in Takotsubo syndrome. *Circulation*. 2019;139:413-5.
4. Beneduce A, Bertoldi LF, Melillo F, Baldetti L, Spoladore R, Slavich M, et al. Mechanical circulatory support with impella percutaneous ventricular assist device as a bridge to recovery in Takotsubo syndrome complicated by cardiogenic shock and left ventricular outflow tract obstruction. *JACC Cardiovasc Interv*. 2019;12:e31-2.
5. Aalberts JJ, Klinkenberg TJ, Mariani MA, van der Harst P. Mechanical circulatory support for refractory cardiogenic shock in Takotsubo syndrome: a case report and review of the literature. *Eur Heart J Case Rep*. 2017;1:ytb005.
6. Tornvall P, Collste O, Ehrenborg E, Jarnbert-Pettersson H. A case-control study of risk markers and mortality in takotsubo stress cardiomyopathy. *J Am Coll Cardiol*. 2016;67:1931-6.
7. Saxena A, Garan AR, Kapur NK, O'Neill WW, Lindenfeld J, Pinney SP, et al. Value of hemodynamic monitoring in patients with cardiogenic shock undergoing mechanical circulatory support. *Circulation*. 2020;141:1184-97.