

Atypical mid-ventricular Tako-tsubo cardiomyopathy in a pregnant patient presenting with acute pulmonary edema: a case report

Forme atypique de syndrome de Tako tsubo avec atteinte médioventriculaire chez une femme enceinte: Cas clinique

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Résumé

La cardiomyopathie de Tako-tsubo réalise une dysfonction ventriculaire gauche aigue par ballonisation apicale et touche essentiellement des femmes ménopausées dans un contexte de stress émotionnel intense. Sa survenue à un âge jeune est exceptionnelle, encore plus exceptionnelle au cours de la grossesse. Nous rapportons un cas rare de syndrome de Tako-tsubo survenant chez une femme enceinte au cours de la 7ème semaine de gestation et se manifestant par un œdème aigu du poumon. L'atteinte cardiaque ne concernait pas le segment apical comme dans la forme typique de cette cardiomyopathie mais plutôt une akinésie médio-ventriculaire avec des parois basales et un apex de fonction conservée. Le diagnostic a été suspecté sur les données cliniques, biologiques et écho-cardiographiques et a été confirmé par l'imagerie de résonance magnétique.

Mots-clés

Syndrome de Tako-tsubo, grossesse, atteinte médio-ventriculaire.

Summary

We describe a rare case of Tako-Tsubo syndrome which occurred in a young woman at the beginning of pregnancy, who presented with acute pulmonary edema. In this case, the transient left ventricular ballooning involved mid segments and produced a severe impairment of cardiac function with typical echocardiographic and cardiac magnetic resonance findings.

Keywords

Tako-tsubo cardiomyopathy, pregnancy, midventricular dysfunction

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INTRODUCTION

Tako-tsubo cardiomyopathy (TTS) or “broken heart syndrome” or “stress cardiomyopathy” had been typically associated with the characteristic abnormality of a ballooned left ventricular apex with basal segmental hyperkinesis. Recently different morphologic variants have been described. We report an unusual case of a pregnant woman admitted for atypical midventricular TTS.

CASE REPORT

A 32 year old woman in her seventh week of pregnancy presented to the emergency department with acute pulmonary edema. She had no past medical history. She had no history of viral infection. There was no a specific stressful environment. She had no chest pain and there were no significant electrocardiographic (ECG) anomalies (Figure 1). Peak troponin T was elevated at 0.1 ng /mL (normal range (NR) <0.05ng/mL). Pro-B-type natriuretic peptide (ProBNP) was significantly elevated at 18.000 ng/L (NR<350 ng/ L). In the intensive care unit, she suffered hypotension and diuresis reduction.

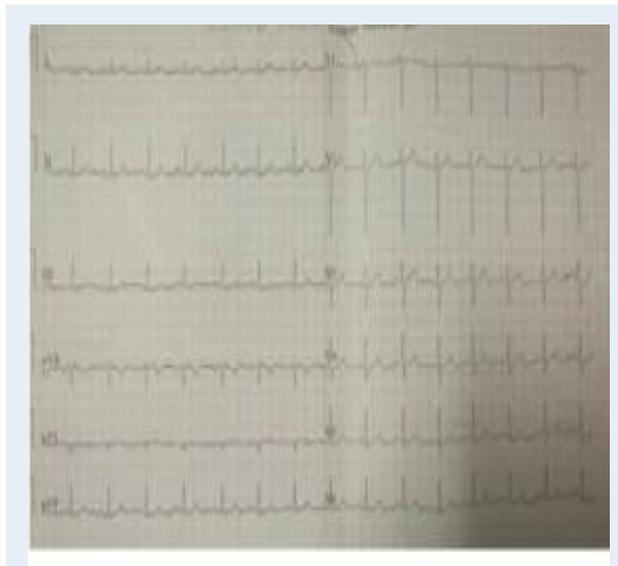


Figure 1: No specific anomalies on electrocardiogram

She was intubated and she improved after intravenous injection of amine (continuous infusion of dobutamine and then levosimendan). Transthoracic echocardiography with speckle tracking study showed left ventricle dysfunction at 25 %; all midventricle segments of a not dilated left ventricle (LV) were akinetic (Figure 2). We performed a cardiac magnetic resonance imaging

examination. Cine view showed midventricular akinesis. There was no edema on T2 weighted images short-inversion-time, inversion-recovery (STIR) or pathological signal activity in the late-enhancement sequences, which ruled out myocardial infarction or inflammatory processes (Figure 3). During the following days the patient showed a progress and on the sixth day she breathed spontaneously after extubation.

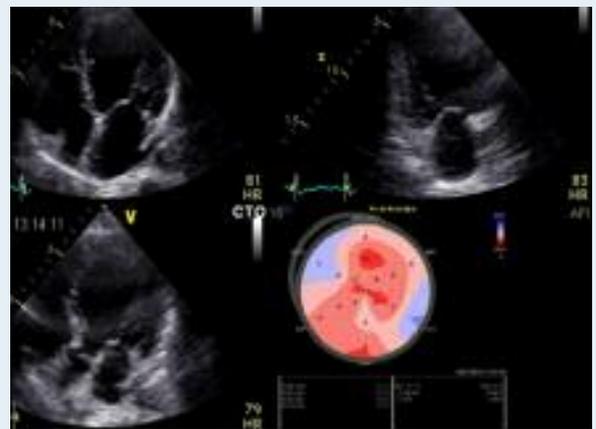


Figure 2: Echocardiographic findings: left ventricle dysfunction with abnormal speckle tracking of the midventricular regions and normal apical region.

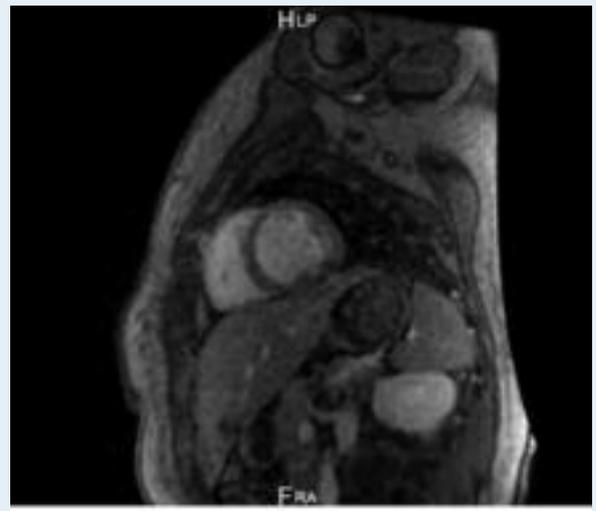


Figure 3: Cardiac MRI showed midventricular akinesis on the cine views and no pathological signal activity in the late-enhancement sequences.

Echocardiogram performed 7 days later revealed significant improvement of LV function. Unfortunately, the woman suffered a spontaneous abortion 10 days after the disease onset. Follow-up echocardiography one month post-discharge showed complete resolution of the

extensive midventricular akinesis and normalization of the ProBNP to 290 ng/L, confirming the diagnosis as tako-tsubo cardiomyopathy.

DISCUSSION

We describe a rare case of pulmonary edema caused by atypical tako-tsubo cardiomyopathy involving only the midventricular segment and occurring in a pregnant woman at 7 weeks of gestation. TTS also called transient left ventricular apical ballooning cardiomyopathy is a clinical entity that was first described by Dote and colleagues in the Japanese population in 1990 [1].

We consider this TTS report particular for many reasons: It regards a young pregnant woman; a situation rarely reported in literature [2]. In fact TTS affects predominately postmenopausal women soon after a psychic and/or physis stress. The mean age reported in the literature ranged from 62 to 76 years [3]. Therefore, pregnancy-associated TTS is considered a special type of TTS. A recent review looked at the incidence of Takotsubo cardiomyopathy in pregnant women and found only 29 published cases, with the majority occurring in the post-par-tum period [4]. We have done a MEDLINE literature review, using PubMed and including the key words "Takotsubo" and "pregnancy and that revealed only 3 cases [5-6-7]. Two of them presented with chest pain and ST segment elevation and occurred in the 5th month and the 23 rd week of pregnancy respectively. For the third case eclampsia has been a trigger for left ventricle dysfunction. For pregnant women with TTS after delivery, the most common physical stressors are perioperative and postoperative procedures [8]. Our case report is also particular because of the unusual presentation: Typically in TTS, the presentation mimics an acute coronary syndrome with chest discomfort and ECG changes indicative of myocardial ischemia. Herein, the onset was pulmonary edema; a situation that is associated with significant morbidity and mortality especially in a pregnant patient. Stress-induced cardiomyopathy is a rare cause of acute pulmonary edema in a pregnant patient, especially prior to delivery of the fetus.

This case is also original because of the atypical location of wall motion abnormalities: Apical ballooning is broadly recognized as the classic form of tako-tsubo syndrome. Atypical subtypes of TTS also exist (basal, midventricular and focal TTS), which represent about 20% of all cases [9]. Interestingly, different forms may occur in the same patient. Jelena R et al showed that patients with atypical TTS are slightly younger than those with typical TTS and more often experience neurologic comorbidities. The BNP levels were higher and left ventricle ejection fraction was lower in patients with typical TTS compared with those with atypical TTS

[9]. ST-segment depression was more prevalent in patients with atypical form while ST segment elevation was found more frequently in patients with typical TTS. The pathophysiological mechanisms responsible for different phenotypes of this syndrome remain unclear: Variability of the density of adrenergic receptors is one theory that remains speculative [10-11]. Ghadri JR et al [12] illustrate that TTS can be triggered by not only negative but also joyful life events and the midventricular TTS type was more frequent among the "happy hearts" than among the "broken hearts".

To our knowledge, our case report represents the first case reported in literature about TTS in pregnant woman with atypical midventricular form.

Treatment of tako-tsubo cardiomyopathy remains pragmatic, with standard care for congestive heart failure. During the acute epi-isode of cardiogenic shock, the use of inotropic agents is con-troversial, because hyper-adrenergic activity is usual-ly responsible for this condition [13]. The restoration of cardiac function is rapid (within 7 days in our case), but the real prognosis is unclear. The reported complications in addition to recurrence of the syndrome are LV failure, cardiogenic shock, arrhythmias, mitral regurgitation, LV free-wall rupture, and rarely death [14]. Outcomes are comparable between patients with typical and atypical forms suggesting that both should be equally monitored [9].

CONCLUSION

Our report of atypical TTS in a pregnant woman gives new information in understanding another aspect of this cardiomyopathy. We shouldn't regard TTS cardiomyopathy as an apical ballooning syndrome in a post menopausal woman, but rather a transient left ventricular dysfunction syndrome with an apical or midventricular pattern that can happen during pregnancy.

REFERENCES

1. Dote K, Sato H, Tateishi H, et al. Myocardial stunning due to simultaneous multivessel coronary spasms: a review of 5 cases. *J Cardiol.* 1991; 21:203-214.
2. D'Amato N, Colonna P, Brindicci P, Campagna MG, Petrillo C, Cafarelli A, D'Agostino C. Tako-Tsubo syndrome in a pregnant woman. *Eur J Echocardiogr.* 2008 Sep; 9(5):700-3.
3. Madhavan M, Prasad A. Proposed Mayo Clinic criteria for the diagnosis of Tako-Tsubo cardiomyopathy and long-term prognosis. *Herz.* 2010 Jun; 35(4):240-3.
4. Minatoguchi M, Itakura A, Takagi E et al. Takotsubo cardiomyopathy after cesarean: A case report and published work review of pregnancy-related cases. *J Obstet Gynaecol Res*, 2014; 40: 1534-39.
5. Bojan Vujin, Dragan Kovacevic, Milovan Petrovic, Igor Ivanov, Gordana Panic Takotsubo cardiomyopathy in pregnancy. *Cent. Eur. J. Med.* 9(1) 2014; 49-53.
6. Brezina P, Isler CM. Takotsubo cardiomyopathy in pregnancy. *Obstet Gynecol.* 2008 Aug; 112(2 Pt 2):450-2.
7. Karamchandani K, Bortz B, Vaida S. Acute Pulmonary Edema in an Eclamptic Pregnant Patient: A Rare Case of Takotsubo Syndrome. *Am J Case Rep.* 2016 Sep 23; 17:682-685.
8. Eitel I, von Knobelsdorff-Brenkenhoff F, Bernhardt P et al. Clinical characteristics and cardiovascular magnetic resonance findings in stress (Takotsubo) cardiomyopathy. *JAMA* 2011; 306: 277-286.
9. Jelena R. Ghadri, MD; Victoria L. Cammann; L. Christian Napp et al. Differences in the Clinical Profile and Outcomes of Typical and Atypical Takotsubo Syndrome. Data From the International Takotsubo Registry. *JAMA Cardiol.* 2016;1(3):335-340.
10. Kawano H, Okada R, Yano K et al. Histological study on the distribution of autonomic nerves in the human heart. *Heart Vessels* 2003; 18:32-9.
11. Bybee KA, Kara T, Prasad A et al. Systematic review: transient left ventricular apical ballooning: a syndrome that mimics ST-segment elevation myocardial infarction. *Ann Intern Med.* 2004;141:858-865.
12. Ghadri JR, Sarcon A, Diekmann J et al. Happy heart syndrome: role of positive emotional stress in takotsubo syndrome. *Eur Heart J*, 2016;37:2823-2829
13. Andrade AA, Stainback RF: Takotsubo cardiomyopathy. *Tex Heart Inst J*, 2014; 41: 299-303.
14. Templin C, Ghadri JR, Diekmann J et al. Clinical features and outcomes of Takotsubo (Stress) cardiomyopathy ». *N Engl J Med*, 2015; 373:929-938.