**CASE REPORT**

**Takotsubo Cardiomyopathy Associated With Work-Place Bullying**

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**Background:** Takotsubo cardiomyopathy (TC) is a condition of transient left ventricular dysfunction precipitated by acute physical or emotional stress. The pathogenesis of TC is not well understood, but it is known to predominantly affect postmenopausal women in the context of physical or emotional triggers.

**Aims:** To describe a case of TC with an association to a never previously described work place stressor of bullying.

**Case Report:** A 48-year-old female lawyer developed acute chest pain after experiencing significant emotional distress at a workplace meeting. She had experienced 18 months of increasing work-related mental stress in a new managerial role. She was initially thought to have a non-ST-elevation myocardial infarction (NSTEMI) with widespread T wave inversion on electrocardiogram and elevated serial troponin. However, a diagnosis of TC was subsequently made given the characteristic apical ballooning morphology of the left ventricle found on echocardiogram, normal coronary arteries on angiography and a normal echocardiogram 3 weeks later. This case report describes TC in a younger demographic and a link with workplace bullying.

**Conclusions:** Chronic workplace bullying has the potential for serious physical harm by precipitating Takotsubo cardiomyopathy.

**Key words** Cardiology; stress cardiomyopathy; Takotsubo cardiomyopathy; workplace bullying; work-related mental stress.

**Introduction**

Workplace bullying is defined as ‘repeated, unreasonable behaviour directed towards a worker or group of workers that creates a risk to health and safety’ [1]. It is an important issue gaining growing attention on an international level due to significant costs to individuals, workplaces and society at large [2, 3]. Takotsubo cardiomyopathy (TC) is a reversible cardiomyopathy precipitated by physical or emotional stress. This case report details, to our knowledge, a previously undescribed association of TC to chronic workplace bullying.

**Case Report**

In January 2016, a 48-year-old Caucasian female public servant presented to a tertiary Australian hospital with gradual onset left sided chest pain and palpitations in the context of severe work-related emotional stress. Symptoms were described as a ‘stretched rubber band’ radiating across her precordium with transient radiation to her left jaw and thumb. The day of symptom onset marked the culmination of 18 months of increasing work-related mental stress in a new managerial role. She was initially thought to have a non-ST-elevation myocardial infarction (NSTEMI) with widespread T wave inversion on electrocardiogram and elevated serial troponin. However, a diagnosis of TC was subsequently made given the characteristic apical ballooning morphology of the left ventricle found on echocardiogram, normal coronary arteries on angiography and a normal echocardiogram 3 weeks later. This case report describes TC in a younger demographic and a link with workplace bullying.

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episode occurred 6–12 weeks before her presentation to the hospital during and after an emotionally stressful work-related event and lasting from late afternoon until she went to bed. The second was after the death of a family cat 4 years ago. These episodes were less severe and remote in time to her current presentation.

The patient was previously well with no past cardiovascular history. Apart from a previous diagnosis of hypothyroidism, she had no other medical diagnoses. She had no symptoms or clinical signs of hypothyroidism. Her only medication was thyroxine 100 micrograms daily. She lived with a supportive husband and two adult children.

Initial observations were within normal limits apart from a blood pressure of 150/90 mm Hg. Cardiovascular and complete physical examination was unremarkable. Initial laboratory tests showed raised serial troponin-I peaking at 3035 ng/L and a mildly elevated thyroid stimulating hormone (TSH) at 7.55 mU/L but normal T4 level. The blood profile, biochemistry, lipase, lipid and liver function tests were all normal. An electrocardiogram (ECG) revealed sinus rhythm with widespread T wave inversion in the anterolateral (I, AVL, V3-V6) and inferior leads (II, III, aVF). The chest radiograph was unremarkable. The patient was initially treated as having non-ST elevation myocardial infarction (NSTEMI) given the characteristic chest pain, raised troponin and ECG changes. An echocardiogram the following day showed a mildly reduced left ventricular (LV) systolic function (ejection fraction 40–45%) with apical and mid-segment akinesia (Figure 1a ). The coronary angiogram demonstrated completely normal coronary arteries with no occlusive lesions (Figure 2).

During a 1 week hospital admission, the patient was stable. She was prescribed metoprolol succinate 95 mg daily, ramipril 5 mg daily, omeprazole 20 mg nocte and aspirin 100 mg daily. Her thyroxine dose was up-titrated to bring her TSH level to normal range. A work-related injury claim was filed by the patient.

At 1 week post discharge, a repeat echocardiogram demonstrated return to normal LV ejection fraction of 55% with complete resolution of segmental abnormalities (Figure 2b). A diagnosis of TC was confirmed, with six out of seven recently described European diagnostic criteria for TC fulfilled [4]. The only criterion not met was elevated natriuretic peptide, which was not measured.

At follow-up 12 months after the event, our patient was clinically well from the viewpoint of cardiology. Her echocardiogram demonstrated normal LV systolic function.

Discussion

TC, also known as ‘stress cardiomyopathy’, was first described in Japan in 1990 [4]. The literal translation of tako-tsubo is ‘octopus pot’—a traditional Japanese fisherman trap, due to its resemblance to the distinctive ballooning shape of the LV apex [4,5]. The aetiology remains unclear with catecholamine stress theory one of the most widely supported [4–6]. The incidence of TC is not known but it accounts for approximately 1–2% of troponin positive acute coronary syndrome presentations [7]. TC is commonly seen in postmenopausal women exposed to a psychological or physical stressor [4,5]. In some contexts, TC may have mortality and morbidity similar to acute coronary syndrome [4,5,8].

This case study is of interest as it appeared to be associated with a younger demographic and chronic occupational psychological stress in the form of bullying. To our knowledge, there is limited data on the link between work-related emotional stress and TC with no known published case reports or studies describing an association of workplace bullying with TC. A recent European and US cohort study of 1750 TC patients demonstrated that up to 28% of cases were precipitated by emotional stressors, of these 7% were related to financial or work-related issues [5]. The nature of these work-related emotional triggers, however, were not described and thus it is unclear whether bullying was associated with TC. To our knowledge, there has been only one case report describing a work-related emotional incident as a trigger for TC [9]. This case, however, was linked to a single work incident and was not described as being associated with a chronic workplace stressor such as bullying.

Figure 1. Transthoracic echocardiogram of left ventricle (LV) during ventricular systole (a) 1 day post presentation: ballooning of LV apical region and (b) 3 weeks post presentation: return to normal LV function.
Our patient, however, endured 18 months of workplace bullying in the form of repeated and undermining staff behaviour from colleagues. She suffered depressive symptoms over this period before developing TC, diagnosed after two episodes of significant chest discomfort related to adverse emotional work environment at 6–12 weeks apart.

Key points

- This case report describes an association of chronic workplace stress of bullying with Takotsubo cardiomyopathy—a condition that may have similar mortality and morbidity outcomes to acute coronary syndrome in some contexts.
- Workplace bullying may result in significant physical harm in addition to psychological harm and economical detriment.
- Although unusual, the younger working population can be affected by Takotsubo cardiomyopathy.

Conflict of interest

None declared

References