Atypical takostubo cardiomyopathy associated with nasal packing for paranasal sinus surgery


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Takostubo cardiomyopathy (TC) is characterized by reversible left ventricular (LV) apical ballooning and no significant coronary artery stenosis. New variants of TC with localized wall motion abnormality or inversed pattern with hyperdynamic apex have been reported. We present the case of a 24-year-old female with atypical presentation of TC occurring in the setting of paranasal sinus surgery under local anaesthesia with post-surgical nasal packing. She did not demonstrated ST-segment elevation on electrocardiogram, but transient moderate LV systolic dysfunction and localized wall motion abnormality affecting basal to mid-ventricular anterior and anteroseptal wall. She rapidly and completely recovered without sequelae.

Keywords
Stress-induced cardiomyopathy • Takotsubo cardiomyopathy • Nasal packing • Sinus surgery • Syncope

Introduction
Stress-induced cardiomyopathy or Takotsubo cardiomyopathy (TC) is characterized by transient hypokinesia of the apical portion of the left ventricle (LV) with compensatory hyperkinesia of the basal walls.1 New variants of this syndrome such as localized wall motion abnormality or inversed pattern with hyperdynamic apex have recently been described in the literature.2–4 Here, we report a rare case of a young woman who had a variant TC with localized wall motion abnormality affecting the left anterior descending (LAD) coronary artery territory of LV wall from basal to mid-ventricular level (inversed TC) in the setting of paranasal sinus surgery under local anaesthesia with post-surgical nasal packing.

Case report
A 24-year-old woman with no history of cardiac disease or hypertension was transferred to the emergency department in our institution due to sudden-onset syncope from local outpatient eye–nose–throat (ENT) clinic. She had undergone an uncomplicated paranasal sinus surgery under local anaesthesia due to maxillary and ethmoidal sinusitis at the ENT clinic 1 day before her presentation and was discharged with post-surgical packing of 0.01% bosmin (epinephrine) plus 2% lidocaine-soaked gauze left in the nasal cavity. She stated that she felt well except discomforts due to nasal obstruction. After 24 h, she visited the ENT clinic again and the nasal packing was removed. Several minutes after removal, she felt palpitation, dizziness, and complained of chest tightness and suddenly experienced syncope and was transferred to our institution. On arrival, blood pressure, heart rate, and temperature were 76/50 mmHg, 83/min, and 36.4°C, respectively. Cardiac examination revealed regular heart rate and rhythm with normal heart sounds and no murmurs. Her initial 12-lead electrocardiogram (ECG) and the follow-up ECGs during hospitalization showed normal sinus rhythm and no definite ST–T-wave abnormality. Initially, we considered that she had an episode of vasovagal syncope and treated her with administration of intravenous atropine and 2 L of normal saline over 2–3 h but she showed persistent hypotension (76/52 mmHg). Infusion of dopamine was started at 10 μg/kg/min, and her blood pressure was maintained at 100/70 mmHg. Initial laboratory examination revealed a white blood cell count of 12 340 cells/mm³ with 85% neutrophils, and a haemoglobin level of 10.7 g/dL. Serum creatinine, serum urea nitrogen, serum proteins, and electrolytes were within the normal range. Troponin-T and creatine kinase-MB fraction levels were mildly elevated to 1.04 ng/mL (reference range <0.1 ng/mL) and 9.24 ng/mL (reference range <2.88 ng/mL), respectively. Initial pro-B-type natriuretic peptide level was 45.2 pg/mL (reference range <153 pg/mL) and later elevated to 5904 pg/mL after 24 h.

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Transthoracic echocardiogram revealed moderate global LV systolic dysfunction [ejection fraction (EF) by biplane Simpson’s method = 41%] with hyperdynamic apex and basal to mid-ventricular akinesis of anterior and anteroseptal walls mimicking acute coronary syndrome (Figures 1 and 2, see Supplementary data online, Videos S1–4). Mild-to-moderate mitral regurgitation (MR) due to mitral valve prolapse was also evident (see Supplementary data online, Video S5). She underwent coronary angiography for further evaluation but coronary angiogram showed normal coronaries (Figure 3). We treated her conservatively and repeat echocardiogram after 72 h revealed complete recovery of her LV systolic function and regression of regional wall motion abnormalities with only trivial residual MR (see Supplementary data online, Videos S6 and S7). After 7 days, she was discharged without sequelae.

**Discussion**

Our patient has some features different from the typical presentation of TC. First, our case showed transient localized LV wall motion abnormality affecting especially territory of LAD coronary artery mimicking acute coronary syndrome. Burgdorf et al.\(^5\) suggest that regional differences in adrenergic sensitivity or innervation could explain different clinical presentations with other regions of hypokinesia. Short-lasting but very intense exogenous sympathomimetic stimulation could spare the apex because this region receives less sympathetic innervation.\(^6\)

Secondly, TC has been reported in various clinical settings such as pheochromocytoma, sepsis, or subarachnoid haemorrhage.\(^1\) Although the cause of TC is unknown, exaggerated sympathetic stimulation due to stress has been proposed as a central factor in the pathophysiology.\(^1\) We postulate that the triggers in this patient were excessive catecholamine stimulation due to emotional and physical stress associated with discomfort due to nasal obstruction or pain during the gauze removal. Also, systemic absorption of epinephrine from nasal application of bosmin-soaked gauze may be responsible for the manifestations of this syndrome. Recently, a comparable case of acute pulmonary oedema associated with TC after local skin infiltration anaesthesia using a combination of lidocaine and epinephrine was reported.\(^7\)

Thirdly, in most reported cases, TC presents as an ST-segment elevation myocardial infarction with classical ECG changes.\(^8\) However, the patient’s ECG did not show the ST-segment elevations or T inversions, as is often seen in TC. Rapid and complete LV recovery within 72 h was particularly impressive in our patient. This rapid recovery may be due to young age (rather than elderly woman), mild global LV dysfunction (EF ~40%), relatively smaller area of myocardial involvement, and less intense illness.\(^9\)

Nasal packing, commonly used to control bleeding in epistaxis and after paranasal sinus surgery, has been reported that some...
of the patients fainted and exhibited the symptoms of vasovagal syncope in this clinical setting and TC must be included in the differential diagnosis.10

Supplementary data
Supplementary data are available at *European Journal of Echocardiography* online.

Conflict of interest: none declared.

References