Reversible Left Ventricular Dysfunction in Suicidal Hanging

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Abstract
Acute and rapidly reversible left ventricular dysfunction may be triggered by various psychological and physical insults. This entity is now well known as stress cardiomyopathy or Takotsubo cardiomyopathy. Suicidal hanging involves intense emotional outburst and the act of hanging is an extreme physical stress. We report a case of rapidly reversible left ventricular dysfunction following attempted suicide by hanging. Usually the outcome is favourable as in our case. The pathogenesis of left ventricular dysfunction in hanging is myocardial stunning due to catecholamine surge. Other mechanisms are also proposed.

INTRODUCTION
Reversible left ventricular systolic dysfunction is known to occur in various medical emergencies like sepsis, envenomation due to scorpion sting, physical stress like trauma, surgery and after intense emotional stress. This condition is known as stress cardiomyopathy or Takotsubo cardiomyopathy and more recently called transient apical ballooning syndrome. Left ventricular systolic dysfunction is due to myocardial stunning due to various mechanisms. This stunning is a transient effect and lasts a few days only and is generally followed by complete recovery. Suicidal attempt involves intense emotional outburst and the act of hanging is an extreme physical stress. A case of reversible left ventricular systolic dysfunction in a survivor of suicidal hanging is reported here.

CASE REPORT
21 year old high school educated unmarried girl was brought to the emergency room with history of attempted hanging from a ceiling fan using her saree. On examination she was restless and gasping for breath. Pulse was feeble and rapid at 134 bpm and her systolic blood pressure was 80 mmHg. Her oxygen saturation was 65%. There was mark of hanging around her neck and no injury to cervical spines could be detected. On auscultation her heart sounds were feeble with no murmur with bilateral crepitations over her chest. Her electrocardiogram (ECG) showed sinus tachycardia and diffuse ST-T changes. Chest X-ray revealed bilateral fluffy shadows especially over right lung. Her hemogram was within normal limits. Blood sugar was elevated (237 mg/dl) and her renal parameters were normal. Serum potassium was 3.1 mEq/L and sodium was 135 mEq/L. Arterial blood gas analysis revealed a pH of 7.3, paCO2 of 53 mmHg and paO2 of 76 mmHg and bicarbonate of 24 mEq/L. Her oxygen saturation improved with noninvasive ventilation and her blood pressure could be maintained with Dopamine infusion at 10µg/kg/min. Bedside echocardiogram revealed global hypokinesia of left ventricle with moderate systolic dysfunction with an ejection fraction of 39% by Teichholz method and 42% by Area length method. Qualitative estimation of Troponin T was negative. Her Total creatine phosphokinase and Creatine phosphokinase – MB fraction were 50 and 12 Units/Liter respectively. She was given Dobutamine infusion in addition to Dopamine. Steroids and Mannitol were also given to decrease cerebral edema. Her hemodynamics and neurologic status improved rapidly and she recovered completely on 3rd day without any neurologic sequelae. After complete weaning of inotropic support, repeat ECG showed normal sinus rhythm with resolution of ST-T changes. Chest X-ray was normal and Echocardiogram revealed no wall motion defect and normal left ventricular systolic function with an ejection fraction of 64% by Teichholz method and 59% by Area length method. She received psychiatric counselling before discharge.

DISCUSSION
Acute physical stress like surgery, trauma, intense physical exertion and emotional stress like anger, intense grief can lead to cardiovascular events. Reversible left ventricular dysfunction is not uncommon after an identifiable trigger. The triggering event could be an acute medical illness or strenuous physical activity or emotionally traumatic one. Reversible left ventricular dysfunction occurs in such situations in the absence of underlying coronary
artery disease or other cardiac morbidity. This entity has been recently well recognised as Stress cardiomyopathy or Takotsubu Cardiomyopathy. Suicidal hanging involves intense emotional and physical stress. In our reported case, the patient had severe hypoxemia and left ventricular dysfunction leading to acute pulmonary edema and hypotension. In addition she also had hyperglycemia probably due to excess cortisol secretion due to stress. All abnormalities resolved over time. This is likely a form of stress cardiomyopathy. Usually cardiac enzymes are elevated only slightly as in our case. Our patient had global hypokinesia of left ventricle instead of apical ballooning as described originally. Generalised wall motion abnormalities are also described in stress cardiomyopathy although segmental wall motion abnormalities are more commonly seen. We believe the mechanism of reversible left ventricular dysfunction is myocardial stunning. Myocardial stunning results from catecholamine excess and increased cortisol secretion. Catecholamine surge is known to occur preceding the act of hanging. Hypoxemia is another postulated mechanism for left ventricular dysfunction but this is unlikely in our patient because left ventricular dysfunction was documented even after her oxygen saturation improved to near normal. This is the first case of reversible left ventricular dysfunction reported in South Asia, in the setting of attempted suicidal hanging.

REFERENCES