Reversible left ventricular dysfunction “takotsubo” cardiomyopathy associated with pneumothorax

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CASE PRESENTATION

An 83 year old woman presented to the emergency department with chest pain and dyspnoea. Chest radiography showed pneumothorax of the left lung. Arteries were normal on coronary angiography. Left ventriculography showed asynergy of apical akinesis and basal hyperkinesis. Within 8 days, the asynergy improved without any specific treatment. In the present case the left ventricular dysfunction may have been induced by altered catecholamine dynamics as a result of pneumothorax.

Reversible left ventricular asynergy, known as “takotsubo” cardiomyopathy, has been reported relatively often. However, a thorough survey of the literature found only one report of concomitant ventricular asynergy and pneumothorax.

DISCUSSION

In Japan, there have been a number of reports of reversible left ventricular dysfunction with symptoms similar to those of acute myocardial infarction but without coronary artery lesions even during the acute phase with ST segment elevation. This type of ventricular dysfunction manifests left ventricular wall motion abnormalities with apical akinesis and basal hyperkinesis, which generally return to normal within a few weeks. This reversible disease is also called “takotsubo” cardiomyopathy for the characteristic shape of left ventricular asynergy; the Japanese word “takotsubo” means an octopus fishing pot with a round bottom and a narrow neck.

Left ventricular wall motion abnormalities have been observed, especially in elderly women over 60 years of age, and in most cases some physical or mental stress precedes the onset of the symptom. These cases are associated with several clinical events, such as myocardial stunning, subarachnoid haemorrhage, phaeochromocytoma, Guillain-Barré syndrome, and emotional stress. The exact mechanisms of ventricular asynergy have not been clarified; however, multivessel coronary spasm or catecholamine cardiotoxicity has been suggested as an exciting cause.

In the present patient, manifestation of coronary spasm was excluded after coronary angiography. Besides, spasm induced ventricular dysfunction is not consistent with patent coronary arteries during the acute phase with ST segment elevation. It is known that diffuse ST segment elevation can be caused by an altered immune response associated with infection. It is also known that catecholamine cardiomyopathy or a high concentration of plasma noradrenaline indicates ST segment deviation on an ECG. Furthermore, in the literature, we did find a case of left tension pneumothorax presenting elevated ST segments. In the present case, however, ST segment elevation persisted even after pneumothorax improved. We suggest that in the present patient left ventricular dysfunction was induced by altered catecholamine dynamics caused by the occurrence of pneumothorax, which could be an underlying stress to increase plasma noradrenaline.
Figure 1  (A) ECG showing sinus tachycardia at 134 beats/min and ST segment elevation in leads V2 through V5. (B) Chest radiograph showing a pneumothorax of the left lung.

Figure 2  Coronary angiography showing no significant stenosis and left ventriculography showing asynergy of apical akinesis and basal hyperkinesis.

Figure 3  The initial change in ECG was noted 12 hours after admission. ST segment elevation in leads II, III, and aVF continued for two weeks followed by deep inverted T waves in all leads.
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REFERENCES
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