

# Stress cardiomyopathy in hip fracture. Differential diagnosis

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Several studies suggest that early treatment of hip fracture is associated with a lower 30 days and long term mortality. Nevertheless patients with preoperative myocardial infarction hip surgery is associated with an high 30 day mortality (30-40%) [1]. Among 1205 patients referred to Trauma Centre of AOU Careggi Florence October 1 2011 - September 30 2013, 5 (four women) out of 21 patients with preoperative significant troponin increase showed ST elevation at ECG. In 2 ECG changes were present at hospital admission while in 3 developed with in the first 24 hours of hospitalization. Average age was 86.2 years (range 78 - 92). Troponin T rose in all patients with a mean peak value of 3.16 ng/ml (range 0.52 to 5.53). The 92 year male patient sustained hip fracture after accidental fall. At admission he complained chest pain and ECG showed anterior ST elevation. Severe left ventricular dysfunction was found at echocardiogram (LVEF 38%). Due to severe cognitive and functional impairment a conservative treatment was suggested. He was discharged at home after clinical stabilization and died two months later due to heart failure. Among the other four patients none had history of coronary artery disease. All were treated since a long time for arterial hypertension. One suffered from moderate aortic stenosis, another was in treatment with oncocarbide for thrombocytosis. Two patients complained chest pain within 24 hours from hospital admission with ST elevation at ECG. Echocardiography showed apical akinesia with decreased left ventricular function. The third patient developed pulmonary edema while waiting for induction of anesthesia, ECG showed ST elevation and echocardiogram severe abnormality of apex wall motion. The last one developed two episodes of supraventricular arrhythmia, the first resolved with adenosine i.v., the second with vagal stimulation. She did not complain chest pain. Her baseline electrocardiogram showed sinus rhythm, normal AV conduction, and incomplete left bundle branch. During the SVT and after its resolution in leads V2-V4 ST segment elevation was appreciable. The echocardiogram showed severe apical hypokinesia and preserved all motion of basal segments. Left ventricular ejection fraction was 30%.

Clinical, electrocardiographic and echocardiographic findings in these four patients fulfilled Mayo clinic criteria [2] for stress induced cardiomyopathy thus we decided to perform coronary angiography to confirm diagnostic hypothesis before hip surgery. No significant coronary lesions were demonstrated in all four patients.  $\beta$ -blockers and aspirin were added to treatment. Wall motion abnormalities improved significantly in all patients within 2-4 days after first examination.

Hip surgery was performed under general anaesthesia between day 4 and 11 after symptoms onset, (two patients were treated with synthesis of fracture, the other with hip prosthesis). The postoperative period was uneventful and patients were discharged to rehabilitation services. At one-year follow-up they were alive, three had recovered fully functional capacity.

Clinical presentation of stress cardiomyopathy may be undistinguishable from STEMI [3,4]. The syndrome has a large female prevalence in the seventh and eighth decade of life. At present only a few cases has been reported in trauma patients and only one in a patient with hip fracture [5]. Preoperative diagnosis has particular relevance in patients who need urgent non cardiac surgery. In fact in stress cardiomyopathy the transient nature of segmental wall motion abnormalities and the absence of significant coronary stenosis are associated with a lower surgical risk in comparison to patients with acute myocardial infarction. In elderly females with hip fracture ST segment elevation associated with apical "ballooning" pattern at echocardiography should raise the suspect of stress cardiomyopathy and coronary angiography is suggested to confirm the diagnosis and schedule orthopedic surgery.

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