Subepicardial aneurysm after blunt chest trauma – a life-saving complication?

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**Subepicardial aneurysm after blunt chest trauma – a life-saving complication?**

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**Short title:**

Subepicardial aneurysm after blunt chest trauma
A 19-year-old man was admitted to our hospital immediately after being run over by a tractor-trailer. Clinical examination was unremarkable. An electrocardiogram (ECG) showed inverted T wave in aVL, V1 leads and ST depression in II, III, aVF, V4-V6 leads.

Transthoracic echocardiography (TTE) revealed mildly dilated left ventricle (LV) with end-diastolic diameter (LVEDD) of 62mm, systolic function was normal with an ejection fraction of 60%. All cardiac valves and great arteries appeared normal. Further examination revealed an oval, echolucent, intramyocardial area (35x15 mm), within the basal lateral wall segment communicating with the left ventricle through a narrow neck. Color Doppler examination showed bidirectional blood flow within that cavity (Figure 1A-B). An ECG gated cardiac CT scan was conducted that confirmed the presence of subepicardial aneurysm (SEA) with preserved epicardium integrity (Figure 1C). SEA formation caused the displacement of the circumflex artery (LCx) branches (Figure 1D). The patient was managed conservatively and remained stable. Serial TTE showed no progression of SEA or worsening of heart function. Cardiac magnetic resonance imaging (MRI) revealed subendocardial fibrous scar in the mid-lateral wall segment and transmural fibrous scar covering aneurysm (Figure 1E, arrow). Coronary angiography was then performed and revealed dissection of the obtuse marginal branch (OM), that was successfully treated by angioplasty. The patient was discharged home three days later.

Control MRI after 3 months showed complete aneurysm regression with the transmural fibrous scar in its location (Figure 1F, arrow). The patient remained asymptomatic.

SEA is considered a rare form of partial myocardial rupture and can occur as a result of myocardial infarction, chest trauma, percutaneous coronary intervention or can form spontaneously [1]. ECG abnormalities in patients with blunt chest trauma are nonspecific, but can be indicative of potentially life-threatening complications. Multimodal imaging is essential in diagnosing and monitoring SEA, as they may remain stable, resolve over time or progress to cardiac rupture, true aneurysm or pseudoaneurysm formation [2]. Clinically stable patients can be managed with careful monitoring while surgical treatment or percutaneous embolization is a recommended option when complications
occur [3]. In this case, the patient has been extremely fortunate as cardiac rupture following blunt chest trauma is usually a fatal condition.

References:


Figure 1. A - Transthoracic echocardiography, zoomed apical four-chamber view showing subepicardial aneurysm; B - Systolic blood flow on Doppler color flow imaging; C - Cardiac Computer Tomography showing subepicardial aneurysm in basal lateral wall; D – Cardiac Computer Tomography 3D reconstruction demonstrating left circumflex artery displacement; E – An initial cardiac magnetic resonance: transmural scar covering aneurysm; F - Regression of aneurysm in control study.