Cardiac injury as a rare cause of cardiogenic shock following polytrauma

Elena Marras1*, Sonja Cukon-Buttignoni1, Giuseppe Berton1, and Wadih Tamari2

1Department of Cardiology, Santa Maria dei Battuti Hospital, Conegliano, Italy and 2Department of Cardiac Surgery, Santa Maria di Ca’ Foscello Hospital, Treviso, Italy

* Corresponding author: Via Mogliansese 47/A, 30030 Peseggia di Scorze´-VE, Italy. Tel: +39 0438663613, Fax: +39 1782206175, Email: elena.marras@alice.it

A 27-old-year man was referred to our emergency department because of polytrauma due to a car accident. Because of airbag inflation, he reported a blunt chest trauma with large pulmonary contusions (70% of lung surface involvement at CT scans). An endotracheal tube was inserted because of severe desaturation due to pulmonary oedema and cardiogenic shock. Patient’s ECG showed sinus tachycardia, q waves V3–V4 leads, T-wave inversion V4–V6 leads, frequent isolated ventricular beats with right bundle brunch block morphology and right-axis deviation and frequent run of non-sustained ventricular tachycardia (Panel A). The patient underwent transoesophageal echocardiography (TEE). Colour Doppler revealed severe mitral regurgitation jet (Panel B; Supplementary material online, Video S1–S2) secondary to the rupture of the anterolateral papillary muscle (ALPM), which prolapsed into left atrium during ventricular systole (Panel C, Supplementary material online, Figure, Videos S3–S4).

After intra-aortic balloon insertion, he was referred to emergency surgery. Macroscopic observation during cardiac surgery displayed left ventricular (LV) wall tear in correspondence of ALPM insertion (Panel D). After mitral valve exposure, complete avulsion of ALPM and part of adjacent myocardium was then observed (Panel E). The patient underwent mitral valve replacement with a biological prosthesis and he showed rapid clinical recovery. At 3-month follow-up, he remained steady in I NYHA class. Traumatic rupture of the papillary muscles is a rare condition after blunt chest trauma; prompt diagnosis and urgent cardiac surgery appear to give a good clinical outcome.

ECG shows sinus tachycardia, q waves V3–V4 leads, T-wave inversion V4–V6 leads, frequent isolated and monomorphic ventricular beats with right bundle brunch block morphology, right-axis deviation morphology and frequent non-sustained polymorphic ventricular tachycardia (Panel A). TEE four chambers and dual chambers long-axis view (Panels B and C). Colour Doppler reveals severe mitral regurgitation jet (Panel B) due to complete avulsion of the anterolateral papillary muscle, which prolapses into the left atrium (Panel C). Intra-operative views (Panels D and E). LV wall after dissection of pericardium; epicardial tear corresponds to anterolateral papillary muscle insertion (Panel D), subsequently repaired with a pericardial patch. Anterolateral papillary muscle and surrounding myocardium specimen after mitral dissection (Panel E).

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