

Inferior ST-segment elevation myocardial infarction and intramyocardial dissecting hematoma following blunt chest trauma

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A blunt chest trauma is a rare etiology of non-atherosclerotic acute coronary syndrome (ACS), needing early diagnosis and treatment [1]. Trauma-related ACS mechanisms include intimal tear, subintimal hemorrhage, intra-luminal thrombosis, and spasm [2]. We present a case of inferior ST-segment elevation myocardial infarction (STEMI) caused by the crushing of the right coronary artery (RCA) following blunt chest trauma that was successfully treated with percutaneous coronary intervention.

A 69-year-old female patient was referred to the emergency department for polytrauma from a traffic collision. Total-body computed tomography scanning revealed lung contusion, left-sided hemopneumothorax, sternal fracture, Th12 vertebral fracture, craniofacial disjunction, and upper extremities fractures. The highest priority was craniofacial disjunction, and the patient was admitted to the Department of Maxillofacial Surgery. After *circa* 48 hours, the patient reported typical angina at rest. ECG displayed inferior ST-segment elevation. A coronary angiogram revealed acute occlusion in the proximal/mid RCA. After reopening the artery with a wire, we observed linear dissection in mid-RCA and a parallel artery, acute marginal branch (AM), filling retrogradely from the collateral circulation from the posterolateral artery. At the site of the cardiac contusion, we observed myocardial blush along the AM with contrast jet extravasation suggesting it had been crashed. Initial RCA pre-dilation with a balloon was followed by the drug-eluting stent implantation with TIMI 3 flow grade. An attempt to find the orifice of the crashed AM failed (Figure 1A–C;

Supplementary material, *Video S1–S3*). We observed a resolution of angina and progression of high-sensitive cardiac troponin T typical for STEMI. Dual antiplatelet therapy was initiated. Transthoracic echocardiography (TTE) revealed basal and mid inferolateral hypokinesia and a pulsatile dissection flap, delineating a 34 × 12 mm neocavity of intramyocardial dissecting hematoma (IDH), left ventricular ejection fraction (LVEF) of 55%, and partially organized hemopericardium that had not been observed on focus cardiac ultrasound on admission (Figure 1D; Supplementary material, *Video S4*). Cardiac computed tomography angiography (CCTA) demonstrated a total occlusion of the AM at the site of IDH and showed no evidence of communication between IDH and the pericardium or the left ventricle (Figure 1E; Supplementary material, *Figure S1*). Analysis of CCTA performed before the accident confirmed high RCA bifurcation and non-obstructive lesions in the coronary arteries (Figure 1F). Follow-up TTE performed 2 weeks later showed partial resorption of IDH with preserved LVEF (Supplementary material, *Figure S2* and *Video S5*), so we continued conservative treatment. TTE performed 5 months later showed basal and mid inferolateral akinesia with LVEF of 52% and without IDH; TTE remained comparable at 1-year follow-up.

The management of trauma-related ACS is not standardized. Reported cases were treated with dual antiplatelet therapy, thrombolytic therapy, balloon angioplasty, stent angioplasty, or coronary artery bypass grafting [2, 3]. Prognosis worsens if IDH occurs [4]. An approach to IDH depends on the patient's stability, IDH localization, and communication

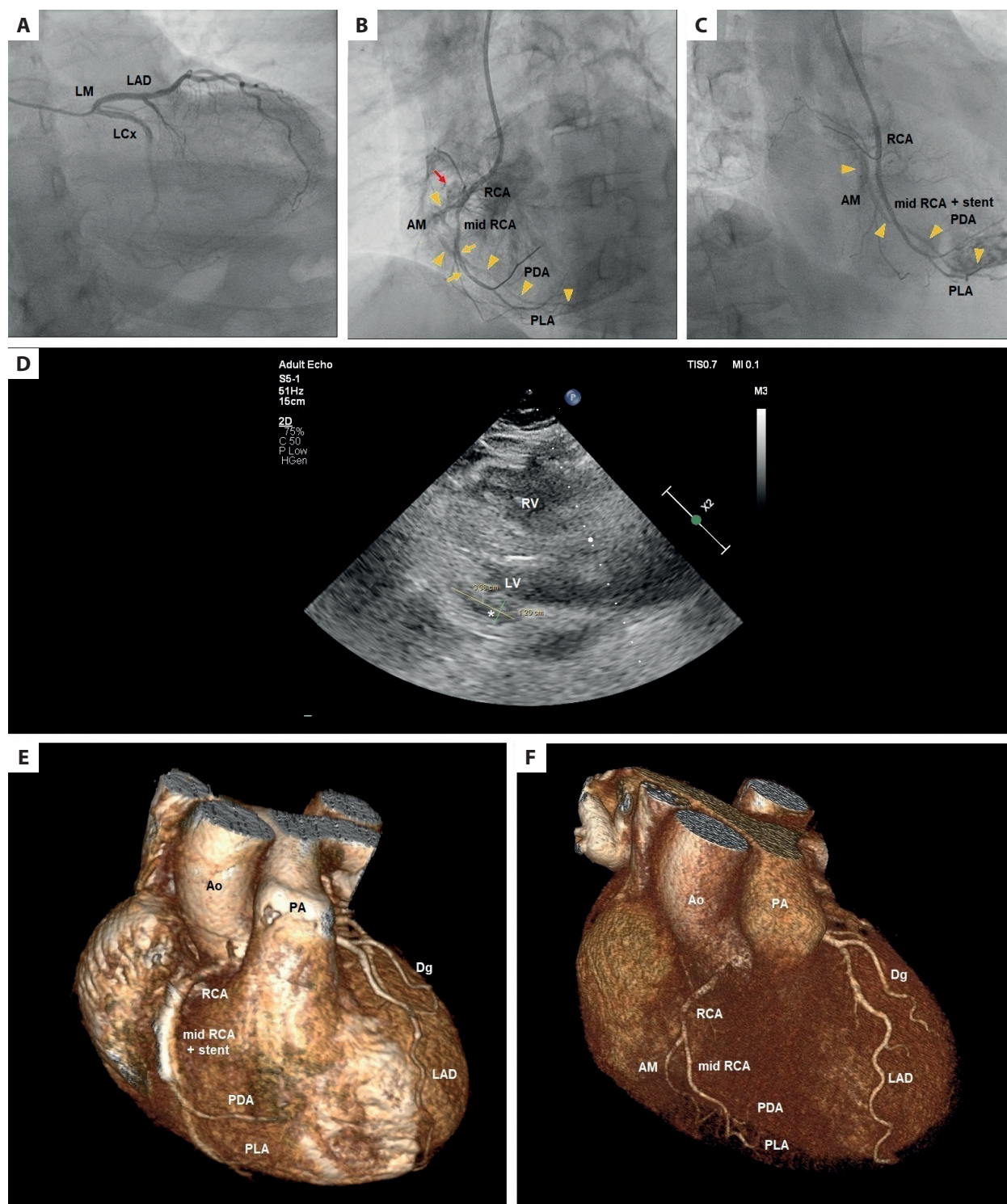


Figure 1. A–C. Invasive coronary angiography and percutaneous coronary intervention. **A.** Non-obstructive lesions in the left main coronary, left anterior descending, and left circumflex arteries. **B.** A lesion in the right coronary artery bifurcated into the mid-right coronary artery, and a crashed acute marginal branch (arrowheads) filled retrogradely from the collateral circulation from the posterolateral artery. Coronary angiogram before angioplasty showed dissection in the mid-right coronary artery (yellow arrows) and blush along the acute marginal branch with contrast jet extravasation (red arrow). **C.** The crashed acute marginal branch (arrowheads) was inaccessible with a guide wire. **D.** Transthoracic echocardiography, parasternal long axis showing intramyocardial dissecting hematoma (asterisk) 3 days after percutaneous coronary intervention, dimeters: 34 × 12 mm. **E.** 3D VR cardiac computed tomography angiography (64 thick) performed 3 days after percutaneous coronary intervention confirmed total occlusion of the crashed artery. **F.** 3D VR cardiac computed tomography angiography (128 thick) performed 1 year before the accident demonstrated high bifurcation of the right coronary artery into the mid-right coronary artery and the acute marginal branch with non-obstructive lesions

Abbreviations: AM, acute marginal branch; Ao, aorta; Dg, diagonal branch; IDH, intramyocardial dissecting hematoma; PA, pulmonary artery; PDA, posterior descending artery; PLA, posterolateral artery; LAD, left anterior descending artery; LCx, left circumflex artery; LM, left main artery; LV, left ventricle; RCA, right coronary artery; RV, right ventricle; VR, volume rendering

with IDH [4]. In our case, we decided to treat trauma-related ACS with primary percutaneous coronary intervention and IDH conservatively in the case of patient's stability, no presence of communication between IDH and the cavities, and gradual resorption of IDH with favorable short- and long-term outcomes.

Supplementary material

Supplementary material is available at https://journals.viamedica.pl/kardiologia_polska.

Article information

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