


CASE IMAGE

Lethal complication: Ventricular septal perforation and right ventricular infarction after acute myocardial infarction

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Key clinical message

Here, we report a case of ventricular septal perforation complicated with right ventricular infarction after inferior acute myocardial infarction, which was associated with a poor clinical outcome despite the successful surgical treatment.

KEYWORDS

myocardial infarction, percutaneous coronary intervention, ventricular dysfunction, right, ventricular septal rupture

1 | CASE PRESENTATION

An 86-year-old man (body mass index: 22.6) who had a history of hypertension and bronchial asthma presented to the emergency department with chest pain of 13 h duration. His medication included nifedipine 10 mg/day and Olmesartan 20 mg/day. An electrocardiogram showed first degree atrioventricular block with ST-segment elevations and abnormal Q waves in leads II, III, _aV_F and increased R wave in lead V₂, consistent with infero-posterior myocardial infarction (MI) (Figure 1A). ST-segment elevations in right precordial leads were also observed, which suggested the presence of right ventricular infarction (Figure 1B, arrows). A transthoracic echocardiogram (TTE) showed

a severely hypokinetic infero-posterior left ventricular (LV) wall and right ventricular wall and a 56% of LV ejection fraction. Emergency coronary angiography was performed. Occlusion of the proximal right coronary artery (Figure 1C, arrow) without collateral arteries from the left coronary artery (Figure 1D) was visualized and treated with the placement of a drug-eluting stent (Figure 1E). On the 4th day after admission, newly developed systolic murmur was audible, and he became hemodynamically unstable. TTE revealed ventricular septal perforation (VSP) at the basal posterior septal wall (Figure 1F,G, arrows; Video S1). Although the surgical repair for VSP was successfully performed, he died of severe congestive heart failure 7 days after surgery.

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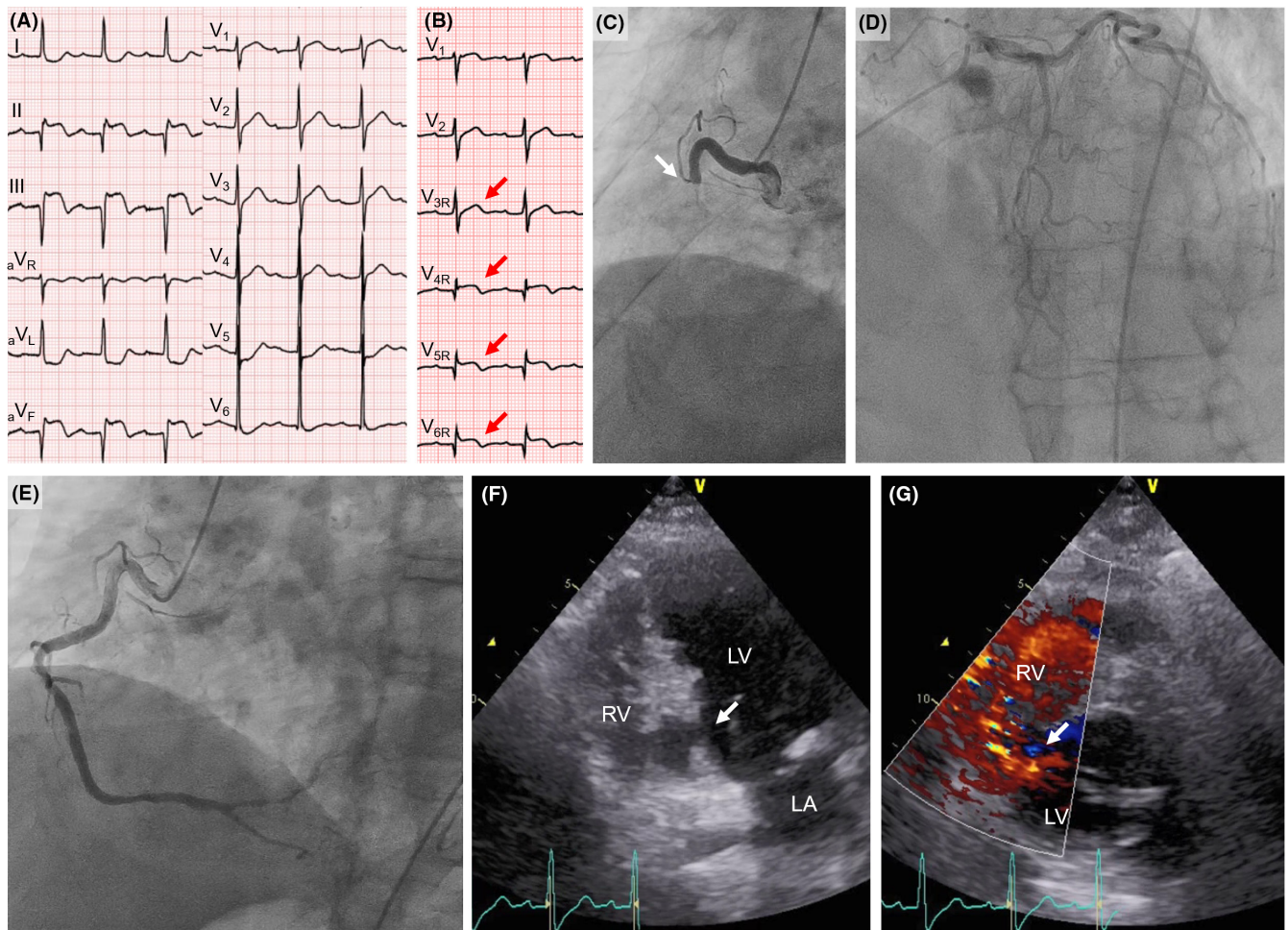


FIGURE 1 (A) A 12 lead electrocardiogram; (B) An electrocardiogram in right precordial leads; (C, D) The initial angiogram for (C) right coronary artery and (D) left coronary artery; (E) Final angiogram after stent implantation; (F) Echocardiogram (apical four-chamber view) showing ventricular septal perforation (VSP); (G) Echocardiogram (parasternal short axis view) showing VSP with left-to-right shunt. LA, left atrium; LV, left ventricle; RV, right ventricle.

2 | DISCUSSION

VSP is a rare though critical complication after MI, which occurs despite the recent progress in reperfusion therapy. The incidence of VSP has been reported to be 0.25% of AMI patients. VSP after MI frequently involves the anterior wall (80.3%) but infrequently the inferior wall (12.7%).¹ VSP usually occurs near the apex (69%) rather than middle of the septum (31%).¹ The predisposing factors of VSP are older age, female, anterior MI and single-vessel disease,² and mortality rate is reported to be 45%–80%.¹ This case was rare because VSP occurred in the inferior wall of basal septum, and furthermore, complicated with right ventricular infarction, which led to the poor clinical outcome.

In this case, VSP occurred probably due to the pre-hospital delay and the acute total occlusion with poor collateral arteries. The total occlusion lesion without good collateral arteries could damage wider range of

myocardium by reperfusion injury. Because malnutrition is reported to be associated with poor collateral arteries,³ the better nutritional status prior to the cardiac event as well as sufficient accessibility in seeking hospital care was needed for preventing this case's critical complications. Transcatheter closure of VSP may be one of the therapeutic options for a high-risk patient like this case.

AUTHOR CONTRIBUTIONS

Takao Konishi: Conceptualization; data curation; investigation; project administration; visualization; writing – original draft; writing – review and editing. **Naohiro Funayama:** Conceptualization; writing – review and editing. **Tadashi Yamamoto:** Conceptualization; writing – review and editing. **Daisuke Hotta:** Conceptualization; data curation; writing – review and editing. **Shinya Tanaka:** Conceptualization; writing – review and editing.

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CONFLICT OF INTEREST STATEMENT

The authors declare that they have no conflict of interest.

DATA AVAILABILITY STATEMENT

The data related to this study are available from the corresponding author upon reasonable request.

ETHICS STATEMENT

None.

CONSENT

Written informed consent was obtained from the case's next-of-kin to publish this report in accordance with the journal's patient consent policy.

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SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

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