

# Sudden Cardiac Death with Myocardial Infarction after Free-flap Lower Extremity Reconstruction

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To the Editor: Free-flap reconstructions involve factors that can increase the risk of myocardial infarction (MI; e.g., the intraoperative use of a vasoactive agent, body temperature maintenance, and postoperative administration of fluid therapy and/or antithrombotic drugs).<sup>[1]</sup> MI has been observed after free-flap head and neck reconstruction<sup>[2]</sup> although it has not been reported after free-flap lower extremity reconstruction. Thus, we report a rare case of sudden death from MI after free-flap foot reconstruction.

A 58-year-old man with diabetes developed a wound at the first metatarsophalangeal joint [Figure 1a]. We evaluated his preoperative cardiac status using electrocardiography and echocardiography, which revealed normal findings [Figure 1b]. Therefore, the defect was covered using an anterolateral thigh free flap [Figure 1c]. On day 3, we identified congestion in the flap [Figure 1d] although we were able to alleviate the congestion by day 8. On day 10, the flap had fully survived [Figure 1e] and the patient was ambulatory.

However, on day 30, he collapsed and complained of chest discomfort. An electrocardiogram revealed complete atrioventricular block with ST segment elevation in leads II, III, and arteriovenous fistula [Figure 1f], and his cardiac troponin I value was 4.7 µg/L; these findings were consistent with MI. Coronary angiography was performed within 2 h after the collapse which revealed acute total occlusion in the proximal portion of the right coronary artery and the left circumflex coronary artery [Figure 1g]. Right coronary blood flow was restored after balloon angioplasty [Figure 1h], although the patient continued to exhibit severe left ventricular dysfunction with ventricular fibrillation, and ultimately died on day 31.

Free flaps are commonly used for lower extremity reconstructions although they have traditionally been considered contraindicated for diabetic foot reconstructions.<sup>[3]</sup> However, the flap survival rate has improved to 92% as a result of the multidisciplinary approach to reconstruction.<sup>[3]</sup> Nevertheless, diabetic foot reconstruction remains challenging, and flap-related complications are inevitable.

Although MI after free-flap head and neck reconstruction has been reported,<sup>[2]</sup> MI remains rare after lower extremity reconstructions. In the present case, the patient did not have a history of coronary artery disease, and the operative risk was deemed to be low, based on the preoperative electrocardiography and echocardiography findings.

However, the patient had several inherent risk factors (20-year history of diabetes, hypertension and hyperlipidemia, and 30 packs cigarettes/per year), as well as several operative risk factors (e.g., a long operative/anesthetic time [5.5 h], blood loss related to leech application, and 100 ml/h of fluid therapy). Other relevant risk factors included 9 days of absolute bed rest and the use of antithrombotic drugs.

In this case, it remains unclear whether the MI was directly related to the free-flap reconstruction as the MI occurred at 30 days after the reconstruction. Nevertheless, the free flap and its perioperative management (e.g., use of antithrombotic drugs) and the patient's inherent factors clearly had some influence. Therefore, it is important to consider that spontaneous MI and sudden cardiac death is possible in patients with no history of coronary artery disease and no abnormal finding during the preoperative heart examination. Thus, we suggest rapid evaluation and aggressive management of cardiac symptoms without delay during the postoperative management of free-flap reconstruction.

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## Conflicts of interest

There are no conflicts of interest.

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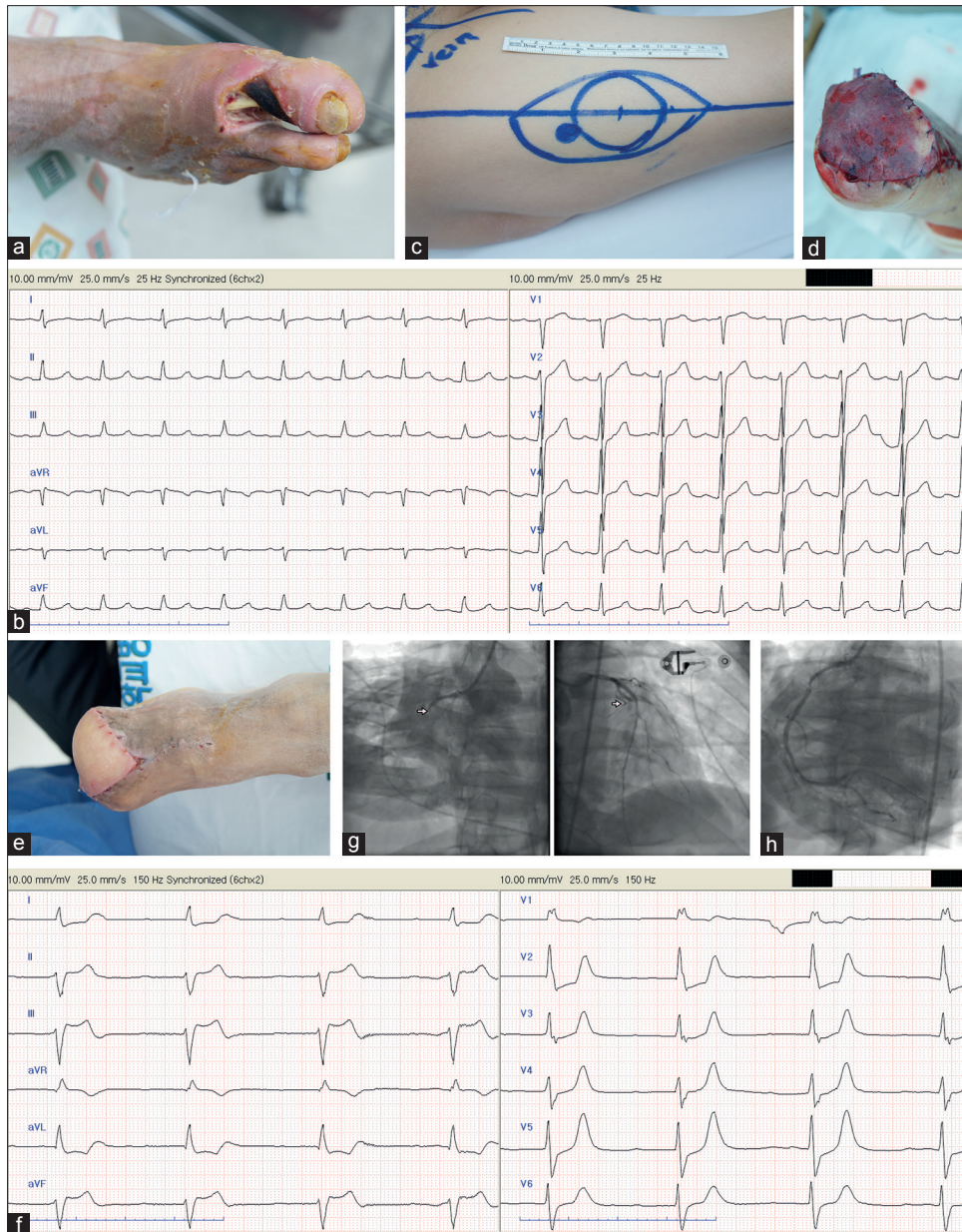
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**Figure 1:** (a) Preoperative finding, (b) preoperative electrocardiogram, (c) flap design, (d) the flap after it developed congestion, (e) results, (f) complete atrioventricular block with ST segment elevation in leads II, III, and arteriovenous fistula, (g) findings from coronary angiography after the event, (h) findings after balloon angioplasty.

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