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Late-presenting Symmetrical Peripheral Gangrene in a patient with cardiac arrest post-coronary artery bypass graft: Will early intervention reduce the risk of unfavorable cardiac outcomes?

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Symmetric peripheral gangrene (SPG) is a rare entity characterized by symmetrical distal ischemic changes, leading to gangrene of two or more sites in the absence of large vessel obstruction or vasculitis. We present the case of a 54-year-old man with bilateral necrosis of the toes that occurred after 12 days of the coronary artery bypass graft. On further testing, patient's thrombophilia profile showed positive results for lupus anticoagulant and R506W mutation on factor V Leiden. It is suggested that the hypercoagulability from lupus anticoagulant and/or factor V Leiden, with the critical cardiac condition might be responsible for the SPG.

Introduction: Symmetrical peripheral gangrene (SPG) was first mentioned by Hutchinson in 1891 (1). It is characterized by symmetrical distal ischemic damage leading to gangrene of two or more sites in the absence of large vessel obstruction or vasculitis (2, 3). Though poorly understood, SGP is commonly associated with a hypercoagulable vasospastic situtaion in a low-flow state, leading to microcirculatory occlusion (2, 4, 5). It is very important to recognize early as SPG is associated with high rate of amputation and high mortality rate. In patient who had severe cardiac conditions, SPG always presented within 7 days of hospitalization for the cardiac manifestation (6-13). As the result, SPG is always seen in hospital rather than clinic settings. Today, we describe a case of symmetrical peripheral gangrene after presenting later than 7 days from a coronary artery bypass graft for its unusual and interesting features.

Case report: A 54-year-old Caucasian man was presented to the office for establishing cardiovascular care with us. The patient's medical history includes allergic rhinitis due to pollen, obstructive sleep apnea, hypertension, hyperlipidemia, and significant history of cardiovascular disease.

On January 07, 2021, the patient underwent a coronary artery bypass graft (CABG) surgery to LIMA/mid LAD, SVG/distal RCA, and SVG/OM due to myocardial infarction. Postoperatively, he suffered from a cardiac arrest due to ventricular fibrillation which required open-heart massage and cardiac re-exploration with an additional graft to the LAD distal to the more proximal anastomosis. During hospitalization, the patient developed shortness of breath and alteration of consciousness presumably due to paroxysmal atrial fibrillation with premature ventricular contractions. Of note, echocardiogram on post-op day 5 showed moderate to

severe mitral regurgitation and low left ventricular ejection fraction (LVEF) of 45-50%.

On January 19, 2021, the patient developed small blisters in the feet and bluish discoloration from proximal to distal phalanges in the bilateral lower extremities. However, lower extremity arterial duplex, as well as venous duplex, were negative for a blood clot or thrombosis. Echocardiograms in February showed moderate to severe mitral regurgitation and ischemic cardiomyopathy with grade III diastolic dysfunction, LVEF of 40-45%. Within the next few months, the blisters broke open, dried out, and healed, while his toes slowly progressed to dry gangrene. The patient reported dull pain with a tingling sensation, bilateral stiffness, no pitting edema, normal peripheral pulses, and no fever throughout the progression of the gangrene. Per patient's primary care physician, his LVEF was stable at 40-45%.

On June 28, 2021, the patient was admitted to the hospital for a near syncopal episode, palpitation, and shortness of breath. His repeat echocardiogram showed LVEF of 30-35% and severe segmental wall motion abnormalities despite maximal tolerated dosage of Sacubitril/ Valsartan and Metoprolol for greater than 3 months. His EKG showed sinus rhythm with frequent monomorphic PVCs and left ventricular excitation while taking amiodarone for bigeminal PVCs. He was suspected of a syncopal episode due to ventricular arrhythmia associated with acute decompensated congestive heart failure in the setting of severe ischemic cardiomyopathy. As a result, he was later given a dual-chamber ICD implantation after being stabilized from the recent hospitalization. At this time, the patient reported that his gangrene became drier and turned into eschar with some sloughing off at the edge. He visited a podiatrist to take care of most of the eschar on his foot.

The patient returned to his cardiology in Washington twice for the device interrogation before visiting our office the first time in Arizona on 08/06/2021. During the visit to our office, the patient stated that some of the eschars fell off and he had some pain that was controlled by Tramadol and Tylenol. On examination, the gangrene on his toes was dry without discharge or ulceration and localized at the distal phalanges of the bilateral lower extremities. He had no fever. Both extremities were warm with normal bilateral pulses. Thrombophilia profile was ordered and results came back on 08/18/2021. His antithrombin level was mildly elevated with positive results for lupus anticoagulant and R506Q mutation of factor V Leiden. However, his ANA was negative.

Of note, the patient has no history of smoking, and his platelet counts during this time were consistently in the normal range. The patient is currently taking furosemide, Sacubitril/ Valsartan, apixaban,

Conclusion: Symmetrical peripheral gangrene is characterized by symmetrical distal necrotic in two or more distal extremities in the absence of large vessel obstruction or vasculitis. SGP is commonly associated with a hypercoagulability a low-flow state, leading to microcirculatory occlusion. In patient who suffered from shock, SPG should be suspected in patient presenting with blisters and discoloration in bilateral extremities regardless the day from cardiac event. If SPG presents later than 7 days, a thrombophilia profile should be ordered and anticoagulant can be initated as soon as possible. Heparin has been anecdotally used by many authors. Surgery should be avoided if clinical shows good progression and there is no sign of super-imposed infection.