Skin Mottling as Clinical Manifestation of Cardiogenic Shock

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Figure 1. Skin mottling (Mottling Score 2) observed in the lower extremity

According to Van Diepen et al, cardiogenic shock is defined as the inability of the heart as a result of impaired pumping function to deliver adequate amount of blood to tissues to meet resting metabolic demand.[1] According to Society for Cardiovascular Angiography and Interventions (SCAI), the hallmarks of cardiogenic shock are hypotension and hypoperfusion which can be classified into five levels. Based on SCAI consensus, diagnosis and classiciation of cardiogenic shock are dependent on both physical examination and biochemical markers. Prompt recognition of cardinal signs of cardiogenic shock is vital in prompt and appropriate management of said patients.[2]

One of the more easily recognizable signs of CS is the assessment of peripheral circulation. Physical examination of the peripheral is convenient, accessible and were shown to be able to differentiate the stages of shock experienced by the patients. If the patient is at the initial period of shock, there would be systemic vasoconstriction to preserve the vital organs of the patient via decreased perfusion of the tissues. Persisting peripheral vasoconstriction despite stability of hemodynamics may signify worse outcomes in patients with cardiogenic shock.[3]

Skin mottling is defined as a red-violaceous discoloration of the skin that is usually found in the lower extremity. Pathophysiology of mottling skin is believed to be due to peripheral vasoconstriction of the skin. However, the exact patophysiology remain controversial: observations showed that mottling areas are

colder than normally colored skin. Assessment using NIRS showed that mottled areas have lower StO2 compared to the healthy skin tissues. Mottling skin were classified using Mottling Score in which we classified into 5 levels: score 0 found no mottling, score 1 with modest mottling area localized to the center of the knee, score 2 is moderate mottling area that does not exceed superior edge of the kneecap. Score 3 mild mottling area that does not exceed middle thigh. Score 4 is severe mottling area that does not exceed the fold off the groin. Score 5 is extremely severe mottling area that exceeds the fold of the groin.[4] Coudroy et al discusses the impact on the persistence of skin mottling during hospital stay. In this study, we see that a patient assessed with septic shock had 40% skin mottling. Among patient with persistent skin mottling, it is considered as an independent risk factor for in-ICU mortality and also organ dysfunction.[5] Persistent skin mottling is a surrogate marker for poor perfusion to the peripheral tissues.

A 59 years old male came to the emergency department with chief complain of dyspnea. Dyspnea has worsened since 3 days before admission accompanied with dyspnea on effort, orthopnea and paroxysmal nocturnal dyspnea. In the emergency department, patient experienced cardiac arrest after defecating, leading to cardiopulmonary resuscitation for 45 minutes. Administration of vasoactive drugs were done and the patient was intubated.

Post resucitaiton physical examination showed that the patient was sedated, with blood pressure of 72/40 (on dobutamine support). Peripheral circulation examination showed cold and clammy extremities, skin mottling of the lower extremity with mottling score of 2. CRT is more than 2 seconds. Blood gas analysis showed severe metabolic acidosis with blood lactate of 8.1.

Angiographic examination were previously done on the patient during the previous admission with the results of three vessels disease with a chronic total occlusion in the left anterior descending artery. However, patient had refused further intervention regarding the coronary problems. Patient also has longtsanding atrial fibrillation.

Patient was admitted into the intensive care unit for further management. Patient was stabilized during admisison in the intensive care with inotropes, however despite the hemodynamic stablilization the skin remain mottled-regardless. Patient had complicating factors in the form of pneumonia and sepsis. Patient had difficulty in weaning the ventilator and died because of arrythmia complication.

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