

Petechial purpuric rash after non-invasive blood pressure measurement: Rumpel-Leede sign

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DESCRIPTION

A 62-year-old man with a history of hypertension, hypercholesterolaemia, myocardial infarction and chronic renal failure was admitted at the cardiac care unit after having undergone a percutaneous coronary intervention (PCI) for a ramus circumflex artery stenosis earlier that morning. Based on the patient's clinical presentation with an acute coronary syndrome/non-ST segment elevation myocardial infarction, he had been started—in addition to his chronic aspirin treatment—on ticagrelor pre-PCI. During heart catheterisation he had received a bolus of 5000 International Unit (IU) of heparin at the start of the procedure, and an additional 2500 IU of heparin before proceeding to ad-hoc PCI.

The heart catheterisation procedure was performed via the right radial artery, and initial haemostasis at access site was achieved by placement of a radial artery compression band (Rayband; Lepu Medical, Beijing). As per protocol, the compression band was at first inflated with 12 mL. Due to a subcutaneous bleed and haematoma forming next to the initially placed radial artery compression band, a second radial band was placed adjacent to the first band at the proximal side, successfully suppressing further growth of the haematoma. The radial band



Figure 2 Haemorrhagic bulla at the site of the radial puncture.

deflation protocol was followed for both applied devices, with deflation after 30 min until pulsation/flow was visible while still achieving haemostasis; after another 30 min and then after 60 min, the compression bands were further deflated by 2 mL, respectively, with complete deflation and removal of the bands after 2 hours.

Several hours later, the patient developed a non-blanching rash immediately following inflating a sphygmomanometer cuff for blood pressure measurement. On examination, the patient had multiple fine petechiae and non-palpable purpura scattered around the right lower arm (figure 1). Remarkably, the upper boundary of the petechial rash was well demarcated at the antecubital fossa, closely following the lower border of the sphygmomanometer cuff. Except for a haemorrhagic bulla at the radial puncture site (figure 2), no other skin lesions or symptoms were present.

These findings are consistent with a clinical diagnosis of tourniquet-induced petechiae, first described by Theodor Rumpel in 1909 and Carl Stockbridge Leede in 1911 in patients suffering from scarlet fever, hence also known as the 'Rumpel-Leede sign'. This clinical phenomenon refers to the acute development of a petechial rash distally from a cuff typically applied to the upper arm.¹ The petechiae are a result of acute rupture of the dermal capillaries, signifying microvascular fragility.² The Rumpel-Leede sign was formerly used to evaluate for thrombocytopaenia and other bleeding tendencies, and is nowadays still used infrequently for analysis of haemorrhagic manifestations in dengue fever (referred to as tourniquet test) and encountered in patients with immune thrombocytopaenic purpura.^{3 4} It has also been described following



Figure 1 Disseminated fine macular petechiae and non-palpable purpura without ulceration on the right lower arm and hand (A). The upper boundary of the petechial rash was rather well demarcated at the antecubital fossa (B).



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Learning points

- The Rumpel-Leede sign refers to the acute development of a petechial rash distally from a cuff typically applied to the upper arm and is caused by acute rupture of the dermal capillaries, signifying microvascular fragility.
- Tourniquet-induced petechiae can be accidentally encountered with non-invasive blood pressure measurement in patients having an increased risk for capillary fragility, such as haemodialysis and antiplatelet therapy.
- Recognition of this self-limiting clinical phenomenon is important to avoid unnecessary diagnostics.

radial artery catheterisation.^{5 6} Other predisposing factors include diabetes mellitus and hypertension. Our patient had normal platelet counts, making the petechiae likely attributed to microvascular fragility related to hypertension and chronic renal failure requiring haemodialysis, in addition to the increased intracapillary pressure due to cuff compression.^{2 7} Additionally, the patient's aspirin and ticagrelor treatment impacting platelet function may have contributed to the petechial purpuric rash.⁸ In view of the benign characteristics of the rash and the indication for potent platelet inhibition in the setting of an acute coronary syndrome with subsequent PCI, we did not adjust dual antiplatelet therapy.

Interestingly, in this patient, the rash did not occur after placement of the radial compression band, probably because it was inflated just enough to achieve haemostasis while allowing arterial flow past the compressed segment, a condition called 'patent haemostasis'. In contrast, inflation of the sphygmomanometer led to a temporarily complete occlusion of the arterial circulation with subsequent acute release of arterial flow, which posed the classic trigger of the Rumpel-Leede sign. The bulla

that developed at the radial access site is likely more related to the radial artery compression tourniquet device.

As the Rumpel-Leede sign can accidentally be encountered with non-invasive blood pressure measurement in patients at risk for capillary fragility, recognition of this self-limiting clinical phenomenon is important to avoid unnecessary diagnostics. In this patient, the petechial rash resolved completely without any sequelae within several weeks.

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