

Radial artery cannulation and reversible skin pallor after saline flushing. What do you do?

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Abstract. Radial artery cannulation is widely used in intensive care units. However, it is not free from risks. We cannulated the left radial artery in a 75-year-old man and observed this phenomenon but found poor information from literature searches. We propose that the pallor around the insertion site after flushing the line with saline may be due to the cold and high-pressure injection, causing localized superficial vasospasm. Luckily, skin pallor resolved once the arterial lavage was stopped. This phenomenon may be less observed by practitioners leading to underestimating the possibility of related complications. (www.actabiomedica.it)

Key words: Radial artery, cannulation, vascular access, complications, skin pallor, spasm

Introduction

In intensive care unit today, radial artery cannulation is more used than femoral approach, being a less invasive procedure and rarely associated with complications (0.03% for a sample of 62,626 procedures) (1), however is not free from risks. One of the most common complications is radial artery spasm (incidence variable from 4% to 20%) and pathophysiology is believed to be related to abundant adrenoceptors in the radial artery wall, which when stimulated by catheter manipulation, wall elongation and local trauma, contribute to increased vasoreactivity with consequent vasoconstriction of smooth muscle. (2) Other risk factors appear to be small radial artery, loops or tortuosity in the vascular system or anatomical variants of the vessel. The occurrence of complications has been associated with multiple attempts, female gender, use of clopidogrel, a larger diameter arterial cannula or mini-invasive cardiac output device and provider inexperience. (3,4). In this case report, we aim to be aware of this and not underestimate patient risk.

Case report

We cannulated the left radial artery in a 75-year-old man with a 20G, 51 mm long, Surflo™ I.V. catheter (Terumo Corporation, Laguna Technopark Binan, Laguna Philippines) after the application of local anaesthetic to the skin and the arterial wave was present on the screen and patient's forearm skin during outflow was normal (Figure 1). However, after flushing the line with saline, significant pallor around the insertion site was observed (Figure 2).

Discussion

We propose that this rare phenomenon may have been due to the use of cold saline injected at high pressure, causing localized superficial vasospasm. Perhaps this vasospasm is caused by transient filling of the arterial runoff vessels from the radial artery with non-red cell containing clear flush fluid.

Regarding management of similar clinical situations, it is documented in the literature (2) that the



Figure 1: Normal patient's forearm skin during radial artery's cannula outflow.



Figure 2: Pallor around the radial artery cannula's insertion site after flushing the line with saline.

administration of additional doses of analgesic and sedative drugs or vasodilators such as nitroglycerin can help relieve radial artery spasm, otherwise, switching to a different insertion site is recommended. Luckily, in our experience we suspended the procedure for a few minutes and the phenomenon was spontaneously reversible, ceasing once the arterial lavage was stopped, however if it continues, doctors should be concerned and consider removing the arterial line.

In conclusion, there is significant heterogeneity in reporting incidence, manifestations, and management of radial access site complications, at least in part due to vague presentation and insufficient diagnosis (5), but practitioners should be aware of therapeutic strategies because similar complications can cause patient discomfort, increase procedure time and be associated with increased morbidity and mortality.

Acknowledgments: None.

Informed Consent: Informed consent of the patient was obtained.

Funding: Support was provided solely from institutional and/or departmental sources.

Conflict of Interest: Each author declares that he or she has no commercial associations (e.g. consultancies, stock ownership, equity interest, patent/licensing arrangement etc.) that might pose a conflict of interest in connection with the submitted article.

Authors Contribution: CF and LV conceived the manuscript and wrote the text. SMM contributed to the critical revision of the manuscript and coordinated LV and CF work. All authors read and approved the final version of the manuscript.

Supplementary Information: online Resource Supplemental video 1 "Skin pallor after radial artery cannulation".

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Received: 25 January 2023

Accepted: 2 March 2023

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