Letter to the Editor

Femoro-femoral veno-venous extracorporeal membrane oxygenation: art and science

Juliano Lentz Carvalho[1]^, Suresh Keshavamurthy[2]^

[1]Department of Surgery, The University of Texas Medical Branch, Galveston, TX, USA; [2]Department of Cardiovascular and Thoracic Surgery, The University of Texas Southwestern Medical Center, Dallas, TX, USA

Correspondence to: Suresh Keshavamurthy, MD. Department of Cardiovascular and Thoracic Surgery, The University of Texas Southwestern Medical Center, 5323 Harry Hines Blvd, Dallas, TX 75390, USA. Email: suresh.keshavamurthy@utsouthwestern.edu.

Comment on: Makdisi G, Wang IW. Extra Corporeal Membrane Oxygenation (ECMO) review of a lifesaving technology. J Thorac Dis 2015;7:E166-76.

Submitted Nov 12, 2023. Accepted for publication Dec 22, 2023. Published online Jan 24, 2024.
doi: 10.21037/jtd-23-1654
View this article at: https://dx.doi.org/10.21037/jtd-23-1654

A review by Makdisi and Wang in 2015 reviewed in detail the history, indications, techniques, and complications of veno-venous (VV) and veno-arterial (VA) extracorporeal membrane oxygenation (ECMO) (1).

My colleagues often say that femoro-femoral VV ECMO does not work. However, it will surely not work when the cannulas are improperly positioned. This important paper has been cited in over 600 articles and reproduced in many medical and surgical conferences. In the paper, they described the two main configurations (VV and VA) of ECMO and highlight the cannulation strategies employed in each of them. However, there is one important, fundamental inaccuracy in the depiction of VV ECMO via femoro-femoral approach (*Figure 1*). In another prominently cited publication by Ventetuolo and Muratore, a similar incorrect cartoon has been published in the *American Journal of Respiratory and Critical Care Medicine* (2). Several physicians have used these incorrect depictions of femoro-femoral VV ECMO in their slides and presentations, and a clarification is warranted.

In the figure provided by the authors, by positioning the drainage cannula in the inferior vena cava (IVC)-right atrium junction, and the reinfusion cannula in the intra-abdominal/infrarenal IVC, makes this configuration a recipe for recirculation (3). The reinfusion cannula should be positioned "more proximal" (or closer to the heart), it should be positioned at a significant distance from the drainage cannula (postulated to be at least 8–10 cm), as the distance between the two cannulas has been shown to be inversely related to the amount of recirculation (3,4).

Our recommendation is to place the return cannula from the right femoral vein using a single hole/terminal hole cannula employing a Bio-Medicus 17 or 19 F cannula and using the drainage cannula from the left femoral vein and use a multi-hole drainage cannula sized 21–25 F and anchor it no higher than 40 cm to avoid recirculation.

^ ORCID: Juliano Lentz Carvalho, 0000-0002-9765-024X; Suresh Keshavamurthy, 0000-0002-5578-1911.

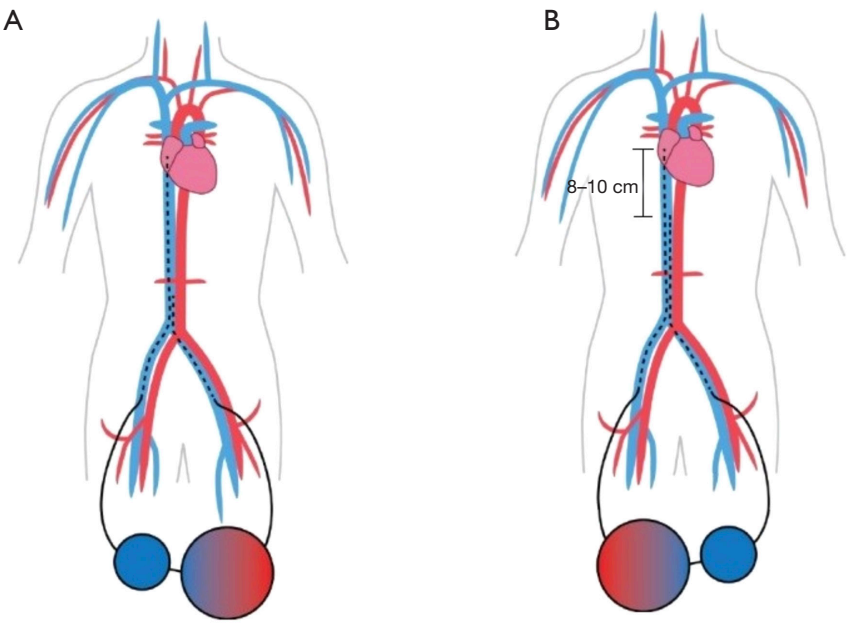

Figure 1 Veno-venous extracorporeal membrane oxygenation via femoro-femoral cannulation approach. (A) The diagram illustrated by Makdisi and Wang (1). (B) The optimal approach to avoid recirculation.

Acknowledgments

Funding: None.

Footnote

Provenance and Peer Review: This article was a standard submission to the journal. The article did not undergo external peer review.

Conflicts of Interest: Both authors have completed the ICMJE uniform disclosure form (available at https://jtd.amegroups.com/article/view/10.21037/jtd-23-1654/coif). The authors have no conflicts of interest to declare.

Ethical Statement: The authors are accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

References

1. Makdisi G, Wang IW. Extra Corporeal Membrane Oxygenation (ECMO) review of a lifesaving technology. J Thorac Dis 2015;7:E166-76.
2. Ventetuolo CE, Muratore CS. Extracorporeal life support in critically ill adults. Am J Respir Crit Care Med 2014;190:497-508.
3. Abrams D, Bacchetta M, Brodie D. Recirculation in venovenous extracorporeal membrane oxygenation. ASAIO J 2015;61:115-21.
4. Burrell AJC, Ihle JF, Pellegrino VA, et al. Cannulation technique: femoro-femoral. J Thorac Dis 2018;10:S616-23.

Cite this article as: Lentz Carvalho J, Keshavamurthy S. Femoro-femoral veno-venous extracorporeal membrane oxygenation: art and science. J Thorac Dis 2024;16(1):816-817. doi: 10.21037/jtd-23-1654