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LETTER TO THE EDITOR

Reply to the letter by Yoshida K, et al

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To the Editor:

We would like to thank Dr. Keisuke Yoshida and his co-authors [1] for the evaluation of our article entitled, "The responses of arterial stiffness parameter Beta-derived index of the aorta and iliofemoral artery to acute hypovolemia in rabbits." [2] The elastic artery (aorta) was transiently and functionally stiffened, whereas the muscular arteries (common iliac to femoral) softened in response to acute bleeding at 2 mL/kg for 6 min.

The three major signs of intraoperative hypotension were hypovolemia, excessive vasodilation, and ventricular dysfunction [3]. From the perspective of an anesthesiologist, Yoshida et al. described the significance of the management of intraoperative hypovolemia and hypotension, which can seriously damage major organs [4]. Clinically, during acute bleeding, blood flow is more likely to be preserved in the iliofemoral arteries than in the aorta, which is important in supplying blood to the spinal cord. The authors mentioned that the femoral artery pressure waveform was good, whereas the radial artery pressure waveform immediately after weaning from cardiopulmonary bypass in cardiac surgery was poor [5]. There is no adequate index reflecting functional arterial stiffness, although total peripheral vascular resistance is known to increase during bleeding. The difference in the responses of the elastic and muscular arteries to acute bleeding may be an important mechanism for changing the blood flow distribution to major organs, such as the brain. Vascular crosstalk between the elastic and muscular arteries may occur to adapt to the hemodynamic changes caused by the hemorrhage.

The letter contained important information connecting pathophysiological research and clinical findings in intraoperative hypovolemia and hypertension, which is of great significance for elucidating the function of the elastic and muscular arteries in response to acute bleeding.

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Declarations

Conflict of interest All authors declare no conflict of interests.

References

1. Yoshida K, Obara S, Yakushiji T, Hakozaki T, Inoue S. Clinical relevance of different responses of elastic and muscular arteries in acute hemorrhage—perspectives from anesthesiologists. J Anesth. 2024. https://doi.org/10.1007/s00540-024-03371-z.
2. Obara S, Hirata N, Hagihira S, Yoshida K, Kotake Y, Takagi S, Masui K. What are standard monitoring devices for

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anesthesia in future? J Anesth. 2024. https://doi.org/10.1007/s00540-024-03347-z.
3. Ito T, Katsuda S, Horikoshi Y, Funyu T, Hazama A, Shimizu T, Shirai K. The responses of arterial stiffness parameter beta-derived index of the aorta and illiac-femoral artery to acute hypovolemia in rabbits. Pulse. 2024;12:76–84. https://doi.org/10.1159/000539480.
4. Shiiya N, Washiyama N, Tsuda K, Yamanaka K, Takahashi D, Yamashita K, Natsume K, Takeuchi Y, Kubota S, Matsui Y. Japanese perspective in surgery for thoracoabdominal aortic aneurysms. Gen Thorac Cardiovasc Surg. 2019;67:187–91.
5. Oh AR, Hong KY, Park J, Her S, Lee JH. Risk factors for femoral-to-radial artery pressure gradient after weaning from cardiopulmonary bypass: a historical cohort study. Can J Anaesth. 2022;69:1330–9.