Reply to Luehr and Etz

Tomoaki Suzuki* and Tohru Asai

Department of Cardiovascular Surgery, Shiga University of Medical Science, Otsu, Shiga, Japan

* Corresponding author. Department of Cardiovascular Surgery, Shiga University of Medical Science, Setatsukinowa, Otsu, Shiga 520-2192, Japan.
Tel: +81-77-5482244; fax: +81-77-5382727; e-mail: suzukikatuta@yahoo.co.jp (T. Suzuki).

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We appreciate the comments from Luehr and Etz [1] on our recent article reporting on selective cerebral perfusion (SCP) under mild hypothermic lower body circulatory arrest (CA) [2].

The purpose of our study was to provide clinical information from this creative surgical procedure based on our own experiences and valuable past studies. As Luehr and Etz commented, the greatest concern raised over mild hypothermic CA relates to spinal cord damage. The safe time limit for CA under mild hypothermia for protection of the spinal cord is unknown. However, a number of clinical studies and graduated exploration by surgeons have gradually delineated a safety margin [2–6].

In research into spinal cord ischaemic damage, it is impossible to perform an experimental study. The only option therefore is to accumulate valuable and precious information from pioneer surgeons and clinical data. In the early stage of 2001–2004, we used deeper cooling to a bladder temperature of <20°C. We did not make a sudden change to the current temperature strategy. We sought to improve our skills in the relevant surgical techniques and used valuable past studies, as an investigate resource, and gradually raised the minimum temperature at the time of CA. As our clinical presentation was based on these efforts and valuable past studies, we hope that readers will give serious attention to the data and seek to learn from them.

As Luehr and Etz pointed out, the estimated safe ischaemic interval for the spinal cord (50 min at 32°C, 75 min at 28°C) is accepted among surgeons worldwide. We recognize that the safety limit is based on the status of CA without SCP. We inserted SCP cannulae into all three arch vessels and perfused using three separate pumps, and achieved blood backflow from the intercostal arteries inside the descending aorta. Although the origin of this blood backflow is unknown and the vascular network in the vertebral artery, mammary artery, intercostal artery and spinal artery was not clarified, we think that the backflow may contribute to the protection of the spinal cord. We, therefore, think that if three-fold SCP is performed, the safe ischaemic interval may be longer than that mentioned previously (50 min at 32°C, 75 min at 28°C).

As a final comment, the only thing that the surgeon can do in this challenging research area is to strive for small improvements by following the valuable efforts of pioneer researchers.

REFERENCES