To the Editor:

We thank Entwistle and colleagues for a balanced and thoughtful review of the ethics of normothermic regional perfusion (NRP). As an author of the cited section on the unifying concept of death, we here state our position that thoracoabdominal (TA) NRP is unethical. The unifying concept of death of the donation after circulatory determination of death (DCD) donor requires the permanent cessation of brain circulation and function. In the absence of collateral blood flow to the brainstem, TA-NRP would be consistent with our unifying concept of death. However, we find TA-NRP to be unethical because of the intentional ligation of the arch vessels (ILAV). Animal data show that even after 8 minutes of asystole, NRP can restore clinical function of the brainstem and electroencephalographic activity in the absence of ILAV. The standard death declaration after 5 minutes of asystole in the DCD requires that the cessation of brain circulation is permanent. In the absence of the intervention of ILAV by the transplant surgeon, restoration of systemic circulation restores brain function. But with ILAV, brain blood flow does not resume solely because of the action taken to ensure that brain resuscitation will not succeed. ILAV can be plausibly viewed as causing death by preventing brain blood flow during resuscitation. This biological fact is not mitigated by donor desires or utilitarian benefits. A dichotomy between flow to the heart and brain was not anticipated in the original framing of DCD. We do support DCD, including direct procurement of hearts.

We conclude that ILAV is an unethical addition to DCD because it contrives to prevent brain resuscitation during circulatory restoration. This was one of several reasons that a Canadian consensus conference did not support NRP-TA.

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References

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REPLY FROM AUTHORS: TYING OFF BRAIN VESSELS: CAN THAT BE OK?

Reply to the Editor:

We appreciate the comments and analysis of Peled and Bernat, whose contributions to the ethics of organ donation we recognize and value. Our paper was a consensus document from the Cardiothoracic Ethics Forum and represents the majority view of the Forum participants. Some participants agreed with Peled and Bernat’s position, so we raised and discussed similar concerns in our paper, including the view that additional study is needed for deeper scientific understanding of brain function in thoracoabdominal normothermic regional perfusion (TA-NRP).

As a group, however, we disagree with the assertion that TA-NRP is definitively unethical. The permissibility of organ donation after circulatory-determined death is based on permanent cessation of circulation to the brain, which inevitably will be totally destroyed. In donation after circulatory-determined death, circulatory cessation is permanent rather
than strictly irreversible because the physicians have no intention of restarting circulation; intentional ligation of the arch vessels (ILAV) respects and implements the intention not to reperfuse the brain. ILAV also allows the transplant team to respect the donor’s autonomous wishes (often through a surrogate decision maker’s decisions) to donate the thoracic organs for transplantation, which is less likely to occur without this intervention.

Peled and Bernat state, “ILAV can plausibly viewed as causing death by preventing brain blood flow during resuscitation.” While this might be true, death can also be plausibly viewed as caused by the patient’s unrecoverable devastating brain injury. When a physician performs the positive act of removing life support from an imminently dying patient, this act is the proximate cause of death, but ethics and law view death as ultimately caused by the underlying disease. Similarly, when a physician performs the positive act of ligating arch vessels to prevent brain reperfusion in a patient already determined to be dead, ethics and law can view death as caused by the preexisting lethal brain injury. An emotional feeling that ligating arch vessels is different and somehow less acceptable than removing life support does not change the fact that both acts are the proximate cause of death. In both cases, the ultimate cause of death is the patient’s underlying illness.

The authors further write, “This biological fact is not mitigated by donor desires or utilitarian benefits,” but they offer no justification for that unqualified assertion. When two opposing views are equally plausible, the patient’s autonomous wish to donate organs and the life-saving benefits to others play an important role in determining the ethics of TA-NRP.

We also wonder, when the authors state, “ILAV can be plausibly viewed as causing death by preventing brain blood flow during resuscitation,” how an act can cause death in a patient already determined to be dead. This seems to be logically inconsistent.

While our group has some sympathy with the views of Peled and Bernat, overall we conclude, as we did in our paper, that TA-NRP should initially be carried out under research protocols to demonstrate absence of spinal collateral blood flow to the brainstem. If this proves to be the case, TA-NRP will have been shown to be consistent with ethical and legal standards and can be used clinically, thereby honoring the donor’s wishes and increasing the availability of life-saving hearts for transplantation.

References

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