Reviewer's report

Title: Total Aortic Arch Replacement under Intermittent Pressure-augmented Retrograde Cerebral Perfusion

Version: 1 Date: 12 September 2010

Reviewer: Lionel Fernand F Camilleri

Reviewer's report:

General comments:
The optimal method to protect the brain during aortic arch surgery is still unresolved.

H Kubota and colleagues provide a novel management protocol for retrograde cerebral perfusion, derived from canine experimental works that add an interesting contribution to this field.

Major compulsory revisions

Paragraph conclusion

1. There is major difference between RCP in the experimental canine model and in humans in term of perfusion.

In the canine model to overcome the problem of jugular vein valves, the RCP was administered through the maxillary vein, so the RCP could gain directly the cranial veins.

In the majority of humans, the jugular vein had competent valves (de Brux JL. Ann Thorac Surg 1995) and it is hypothesized that the RCP gains the brain through a collateral network of veins (azygos, intercostal, medullary and vertebral veins). The usefulness of higher perfusion pressure could be either to distend the valves or more probably to increase the pressure in the collateral vein network to improve cerebral oxygenation. Some comments on this with references should be added to the discussion.

2. Some authors have recommended using higher pressure (range 30 to 50, mean 40 mm Hg for conventional RCP (Ganzel BL, J Thorac Cardiovasc Surg 1997). The authors indicated that they initially have planned to perform the operation using conventional RCP. They should explain why a15 mm Hg perfusion pressure has been chosen.

3. This case report underlines the imperious necessity of determination of rSO2 to assess real time cerebral perfusion (only the anterior part of the brain is assessed by NIRS), detect and immediately solve cerebral malperfusion without any delay before irreversible damage develops. Some comments and reference on the usefulness of NIRS to adjust RCP conditions adequately should be added. Some details concerning the baseline value of rSO2: measures prior
anaesthesia, at the beginning of the ECC, and at profound hypothermia, must be added.

4. Results from a “preliminary randomized comparative study” are mentioned. It should be stated that these results are unpublished data otherwise it should be deleted.

Minor revision

Paragraph case presentation
Are pneumatic arm tourniquets during retrograde cerebral perfusion?

Pr L CAMILLERI

**Level of interest:** An article of importance in its field

**Quality of written English:** Acceptable

**Declaration of competing interests:**

I declare that i have no competing interests'below