Diagnostic challenge of post-operative visual loss after cardiac surgery: a case report

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Introduction

Post-operative visual loss (POVL), is a rare but devastating complication that has been reported after spine, cardiac and head–neck surgeries, with its prevalence being the highest after spine (0.03%) and cardiac (0.086%) surgery [1]. Various causes attribute to post-operative blindness: ischemic optic neuropathy, central or retinal artery branch occlusion, cortical blindness, and external ocular injury [2]. This case report highlights the difficulties in differential diagnostics, related with POVL and the importance of radiologic imaging in clinical diagnostics of POVL.

Case presentation

• A 51-year-old male with diagnosed arterial hypertension II°, severe aortic valve stenosis, P aortic valve regurgitation, left ventricular hypertrophy and congestive heart failure class II stage C, underwent a conventional aortic valve replacement and coronary artery bypass graft surgery with extracorporeal circulation.
• Intra-operatively a 10-15 min. period of low mean arterial pressure (MAP) of 63 mmHg was recorded after intubation of the patient. No other complications were noted.
• Post-operatively patient was hemodynamically compromised due to bleeding in pleural cavity (1300 ml of blood lost in 4 hours, hemoglobin change 103 → 83 g/l).
• After endotracheal tube was removed the next day, the patient complained of complete bilateral visual loss.
• Neurological examination did not conclude any pathologic changes in the eyes. Bedside transorbital duplex ultrasound did not reveal any abnormality in the blood flow of central retinal artery.
• The neurologic analysis detected agnosia, an inability to interpret sensory stimuli.

Management and discussion

In this clinical case, hypotensive ischemic infarction was likely caused by the drop in MAP perioperatively, which resulted in limited blood flow to brain areas, responsible for conducting and analysing visual stimuli (picture 3). Many patients experience such drops while being operated on, however, not all of them develop cortical POVL.

In patients with a history of arterial hypertension, MAP is usually higher compared to normotensive patients. Blood vessels adapt to high blood pressure and so organ perfusion remains normal. If blood pressure drops, blood vessels cannot ensure normal organ perfusion as they have lost their elasticity and ability to adapt to lower blood pressures. Therefore, hypotensive brain stroke is more likely to occur. If post-operative visual loss without pain occurs in a patient who was hemodynamically unstable, head CT and especially MRI should be carried out searching for ischemic lesions in primary visual cortex, which is shown in picture 3 on patient’s MRI scan image.

One way to avoid this complication is to carefully monitor blood pressure during the operation and keep MAP higher than 60 mmHg for all patients, with special consideration given to hypertensive patients. Keeping blood pressure higher than 60 mmHg for all patients, with special consideration given to hypertensive patients on weather to keep their elasticity and ability to adapt to lower blood pressures. Therefore, hypotensive ischemic infarction diagnosis. Cortical POVL in this case was likely caused by insufficient blood flow to the brain.

Conclusions

A careful differential diagnosis is required in order to suspect POVL caused by hypotensive ischemic brain stroke. Head MRI should be the diagnostic test of choice if POVL or a similar condition is suspected.

Differential diagnosis

If post-operative visual loss is suspected, the first question to ask is if the loss of vision is followed by pain or not. If pain is present, traumatic causes are more likely. If, however, patient experiences no pain, various ischemic conditions should be considered [2]

- Anterior ischemic optic neuropathy
- Posterior ischemic optic neuropathy
- Cerebral or cortical visual loss
- Central retinal artery occlusion
- Glycine induced visual loss

Key words: post-operative visual loss, hypotensive ischemic brain stroke, magnetic resonance imaging.

References