Pip may have triggered an inflammatory cascade that led to marked laryngeal oedema. 5, 7 In patients with SCA, the PLMA should be used with caution.

M. Carron*
V. Stefano
C. Ori
Padova, Italy
*E-mail: micarron@libero.it

Severe cerebral desaturation during anterior transapical beating heart aortic valve implantation

Editor—Minimally invasive aortic valve implantation techniques with or without cardiopulmonary bypass (CPB) are increasing as they offer functionally acceptable results in patients with multiple co-morbidities who are not good candidates for conventional aortic valve replacement on CPB. 1 However, careful patient selection is crucial for this novel therapeutic strategy to be a suitable treatment option. Until now, experience with a transthoracic anterior approach without the aid of femoro-femoral bypass has been restricted to a limited number of patients, most of whom had uncompromised left ventricular systolic function. 2 During dilatation of the valvular orifice and during deployment of the new valve, high-frequency pacing needs to be initiated, thereby, inhibiting ventricular ejection that could dislocate the prosthesis and prevent proper positioning. In the course of these short episodes, cardiac output is greatly depressed, which also impacts on cerebral perfusion in off-pump cases. We report a case where high-frequency pacing caused critical cerebral desaturation.

The degree of cerebral desaturation during anterior transapical transcatheter aortic valve implantation without CPB was assessed in a 73-yr-old male patient with severe aortic valve stenosis, left ventricular hypertrophy, but unimpaired left ventricular ejection fraction. The patient also presented with atrial fibrillation. Extracranial cerebral vascular occlusive disease was excluded before surgery. During the 2 h procedure regional cerebral saturation (rSO2) was measured continuously (INVOS 5100, Somanetics, Troy, MI, USA) with the optodes placed over the left and right forehead.

Baseline rSO2 determined immediately after induction of anaesthesia during normocapnic ventilation with an FIO2 of 0.5 was at the lower limit of normal (Fig. 1). By increasing FIO2 to 0.75, rSO2 could be raised to 63% (left) and 68% (right hemisphere, respectively), a finding that has been observed before. 3 Despite this increase in rSO2, FIO2 was again lowered to 0.5 before valvuloplasty where it was set until the end of surgery. Initiation of high-frequency pacing to unload the ventricle was followed by a rapid severe bilateral decline in rSO2 similar to that described with the onset of cardiac arrest. 4 This instant decrease in rSO2 resulted in critical desaturation, that is, saturation below 50% or >20% from baseline that are usually associated with unconsciousness. Reinstitution of cerebral blood flow after termination of high-frequency pacing was associated with recovery of rSO2 to baseline values, which was again followed by a lesser decline during the second episode of high-frequency pacing. While subsequently, baseline values were reached over the left hemisphere again, rSO2 values over the right hemisphere remained below baseline by 5% until the end of the monitoring period, that is, before transfer to the intensive care unit. No overt neurological abnormalities were noted after extubation.

Although the incidence of major neurological events reported after minimally invasive aortic valve-in-valve procedures is low, 1 high-frequency pacing required for proper positioning of the prosthesis without the support of CPB may in some cases not be as harmless as perceived. Comparable brief interruptions of cerebral blood flow in the course of internal cardioverter/defibrillator threshold testing were associated with neuronal injury 5 and impaired cognitive function. 6, 7 Potential future candidates for this technique, with low left ventricular ejection fraction and low baseline rSO2, may experience extensive cerebral desaturation. 3 If these patients are considered for this approach, it may be prudent to pay attention to an adequate reperfusion interval between subsequent episodes of high-frequency pacing 6 and switch to a higher FIO2 before pacing. 3
Fig 1 Trend of regional cerebral saturation rSO₂ (%). TP1, timepoint 1, baseline (FiO₂: 0.5); TP2, FiO₂: 0.7; TP3, skin incision (FiO₂: 0.75); TP4, before first HF pacing (FiO₂: 0.5); TP5, 7 s after HF pacing; TP6, before second HF pacing; TP7, 6 s after HF pacing; TP8, skin closure; TP9, end of surgery.

B. Mora
K. Skhirtladze
M. Dworschak*
Vienna, Austria
*E-mail: martin.dworschak@meduniwien.ac.at

6 Murkin JM, Baird DL, Marztke JS, Yee R. Cognitive dysfunction after ventricular fibrillation during implantable cardioverter/defibrillator procedures is related to duration of the reperfusion interval. Anesth Analg 1997; 84: 1186–92
doi:10.1093/bja/aep122