

## Difficulty Weaning off Cardiopulmonary Bypass in Patient Undergoing Aortic Valve Replacement and Concomitant CABG Surgery

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Based on definition, cardiopulmonary bypass (CPB) diverts blood away from both the left and right sides of the heart and the lungs. Now, CPB is performed in the majority of CABG and valvular replacement surgeries. Aortic valve replacement (AVR) due to aortic stenosis (AS) must be done with CPB, except for transcatheter aortic valve implantation (TAVI). Difficulty in weaning off CPB is a relatively common problem and cardiac dysrhythmias are one of the most serious causes of it (especially after cross-clamp removal). Therefore, it is a serious challenge for physicians during cardiac surgery [1]. Accordingly, we report a case of refractory ventricular tachycardia (VT) during weaning from CPB in AVR and concomitant CABG surgery that epicardial pacemaker was effective to treat it. An 85-year-old male was taken to the operating room for a single vessel CABG and concomitant AVR due to severe AS. His past medical history revealed controlled hypothyroidism and hypertension. Preoperatively, Transthoracic echocardiography revealed calcified aortic valve, severe AS (AVA=1-1.5 cm<sup>2</sup>, Mean Gradient= 60-70 mmHg). Coronary angiography also reported significant single vessel disease (left anterior descending artery=80% stenosis) and severe AS. The surgery was performed with CPB and duration of total CPB and aortic cross-clamp were 82 and 46 minutes, respectively. Despite having normal sinus rhythm on

electrocardiogram monitor (at 50% of the cardiac output), successful coronary revascularization and AVR during CPB, the patient suffered from VT after three or four consecutive sinus beats during weaning off CPB. The VT was not responsive to intravenous boluses of lidocaine (2 mg/kg) and two internal defibrillation intermittently charges of 10 and 20 joules. The CPB was reestablished at 100% of the cardiac output. We rechecked core temperature, hematocrit, arterial blood gas analysis and electrolytes again. All of them were in acceptable ranges. A few minutes later after administration of magnesium sulphate (2gr), intravenous bolus of amiodarone (300 mg), the VT occurred again after three or four consecutive sinus beats during weaning off CPB again. Therefore, five consecutive 10, 20 and three consecutive 30 joules DC shocks were performed again. After these unsuccessful defibrillation attempts, the CPB restarted at 100% of the cardiac output again. Then, the cardiac surgeon placed the ventricular epicardial pacemaker prior to performing TEE. In another attempt to wean off CPB, immediately after observing the sinus beats, we turned on the pacemaker. Fortunately, the VT did not occur and CBP terminated successfully. After reversing protamine sulfate, the pacemaker was turned off. The patient did not show recurrence of VT during surgery and postoperative course. The causes of persistent refractory ventricular dysrhythmia during weaning from CPB include

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intraoperative surgical trauma, reperfusion injury, ischemic damage, inadequate de airing, inadequate myocardial protection, inadequate supply of cardioplegic solution (due to hypertrophy during CPB in patients with AS, especially concurrently with coronary artery stenosis), hypothermia, electrolyte and metabolic derangements. Sustained ventricular dysrhythmia in absence of electrolyte abnormalities should increase suspicion for ischemia [2-4]. In conclusion, the case showed that epicardial pacemaker is able to treat safely and quickly the refractory VT during weaning from CPB.

### References

- [1] Tempio D, Pruiti GP, Conti S, Romano SA, Tavano E, Capodanno D, et al. Ventricular arrhythmias in aortic valve stenosis before and after transcatheter aortic valve mplantation. *Europace* .2015; 17(7):1136–40.
- [2] ALJawada MA, Shorbagy MS, Saleh M. Prophylactic amiodarone in patients with severe aorticstenosis and left ventricular hypertrophy undergoing aorticvalve replacement: Silencing the rebels. *Journal of the Egyptian Society of Cardio-Thoracic Surgery*. 2017; 25(4):337-42.
- [3] Kodaka M, Mori T, Ichikawa J, Ando K, Komori M. Refractory ventricular arrhythmias during aortic valve replacement and cardiac artery bypass requiring 16 attempts of electricalcardioversion: a case report. *JA Clin Rep*.2020; 6(1):60.
- [4] Monaco F, Prima AL, Kim JH, Plamondon MJ, Yavorovskiy A, Likhvantsev V, et al. Management of Challenging Cardiopulmonary Bypass Separation. *J Cardiothorac Vasc Anesth*. 202; 34(6):1622-1635.