MYOCARDIAL PROTECTION IN MINIMALLY INVASIVE CARDIAC SURGERY, USING THE ENDOVASCULAR CORONARY SINUS CATHETER AND THE ENDOAORTIC CLAMP, IS EQUIVALENT TO OPEN MITRAL SURGERY

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Introduction: Since minimally invasive mitral valve surgery (MIMS) began, several cardioplegia strategies have been employed, but no data has established which one provides optimal myocardial protection. In our institution, both antegrade and retrograde cardioplegia are administered in open mitral surgery (OMS) and MIMS. Although it is established that the endovascular coronary sinus (CS) catheter and the endoaortic clamp can deliver cardioplegia in MIMS with an acceptable complication rate, the quality of cardioprotection offered remains undetermined. Thus, we compared both cardioplegia administration strategies in MIMS and OMS to determine their equivalence regarding cardioprotection.

Methods: After Ethics committee approval, charts of patients admitted for MIMS since 2006 were reviewed. Patients without CAD undergoing isolated elective OMS through sternotomy were used as a control group. Cardioplegia in the MIMS group was delivered by the distal port of the endoaortic clamp positioned in the aortic root under TEE, and an endovascular CS catheter positioned under echographic and fluoroscopic guidance and monitored by CS pressure. Groups were matched for surgeons and surgery type. Data was collected regarding myocardial necrosis marker, hemodynamic instability, myocardial function, duration of hospitalization, ICU stay, and mortality. Myocardial infarction (MI) was defined by compatible ECG modification or a CKMB increase ≥100 UI/L.

Results: Data was collected from 111 MIMS files and 111 OMS files. Perioperative MI incidence was similar in both groups (4 MIMS vs 2 for OMS; p=0.6832). No statistically significant difference was found for maximal CK-MB (45.79 vs 40.79; p=0.4712) and number of patient with CK-MB levels > 50 UI/L (31 vs 28; p=0.7614). However, mean troponin levels in MIMS were significantly higher (1.50 vs 0.75; p=0.017). This includes a patient who had a massive perioperative MI due to an unidentified CS catheter displacement during surgery and subsequent decreased CS pressure and inadequate cardioplegia delivery. The information was not communicated. However, once this patient excluded, we obtain lower mean troponin levels (0.66 vs 0.75; p=0.0010) in the MIMS group. More patients received norepinephrine 24 hours post-operatively (25 vs 12; p=0.0297) in the MIMS group, but no difference was noted in second inotropic agent use (29 vs 27; p=0.8891). No difference was observed in duration of ICU (3.1 vs 4.0; p=0.3338) or hospital stays (9.3 vs 11.1; p=0.8712) and deaths (2 vs 1; p= 1.000).

Discussion: Cardioplegia delivered by the endovascular CS catheter and the distal port of the endoaortic clamp in MIMS provides equivalent myocardial protection when compared to OMS, if adequate position and function of the CS catheter is insured by monitoring of the CS pressure during cardioplegia administration.