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Topic: 2 - Adult - Cardiac failure

Abstract: 6

Application of ECMO support during transcatheter valvular procedures

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Objective: ECMO has gained use as a rescue therapy in refractory cardiovascular and respiratory compromise. Increasingly, it is considered for cardiopulmonary support during percutaneous coronary and structural heart interventions.

Methods: We report 3 cases wherein ECMO successfully facilitated transcatheter valvular procedures in patients who were not surgical candidates due to the severity of their illness.

Results: A 51-year-old male presented with myocardial infarction and cardiogenic shock. Echocardiogram showed severe mitral regurgitation from posterolateral papillary muscle rupture. He developed refractory hypoxia from pulmonary edema. He underwent emergent MitraClip under VV-ECMO. He was decannulated 4 days post-procedure and discharged home on day 7 of hospitalization.

A 47-year-old female presented with acute coronary syndrome, and despite revascularization, arrested from ventricular fibrillation. She was emergently placed on VA-ECMO. Echocardiogram showed severe functional mitral regurgitation. After optimization of hemodynamics and volume status on ECMO, she underwent MitraClip procedure 5 days later and was decannulated the same day. She was discharged a week later.

A 34-year-old male presented to an outside hospital with cardiac arrest from myocardial infarction requiring VA-ECMO and Impella support. Following decannulation, he was found to have acute severe aortic regurgitation related to a flail aortic valve cusp, which was likely injured during Impella placement. VV-ECMO was subsequently instituted for refractory hypoxemia. At our center, he underwent transcatheter aortic valve

replacement (TAVR) with VV-ECMO support. His pulmonary status rapidly improved and efforts were directed at weaning ECMO. Unfortunately, the patient suffered a large intracranial hemorrhage and expired 6 days after his TAVR.

Conclusions: The emerging patient population with compromised cardiopulmonary function undergoing percutaneous therapies has seen the use of ECMO as a rescue intervention or for perioperative prophylaxis. Our cases illustrate instances that utilize ECMO for stabilization during high-risk percutaneous valvular procedures which might otherwise not be tolerated. Applications of ECMO in these situations deserve further examination.

Abstract: 9

The role of extracorporeal membrane oxygenation in major aortic surgery with particular reference to aortic dissection

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Objective: Very little is known about the role of extracorporeal membrane oxygenation for the management of patients undergoing major aortic surgery with particular reference to aortic dissection. We sought to review the available literature to determine if there was any evidence

Methods: A systematic literature search was undertaken through PubMed and EMBASE according to specific key words combined as follows: ECMO and aortic surgery; ECMO and aortic dissection; ECLS and aortic surgery; ECLS and aortic dissection

Results: The search retrieved 29 publications relevant to the subject: 1 brief communication; 1 surgical technique report; 1 invited commentary; 1 retrospective case review; 1 observational study; 4 retrospective reviews; 13 case reports and 7 conference abstracts. A total of 194 patients were included in these publications of whom 77 survived. The articles had been published between 1994

Abstract: 314**Extracorporeal membrane oxygenation during cardiac arrest (ECPR): Case report**

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Objective: To report a case of ST-segment elevation acute myocardial infarction associated with severe cardiogenic shock and the use of extracorporeal life support.

Methods: Case report

Results: FNW, 56 years old, male patient, is admitted to the emergency room complaining of severe chest pain radiating to the left arm, sweating and unwell. Diagnosis of acute myocardial infarction in the inferior wall, with ST segment elevation on electrocardiogram. The patient was transferred to hemodynamics to perform a coronary angiography and there he developed severe arrhythmia, followed by cardiac arrest. At this moment, an Intraortic balloon passage was performed and extracorporeal membrane oxygenation cannulation was performed in the venoarterial mode, and immediate hemodynamic improvement was evidenced. The patient was transferred for intensive care unit (ICU) and the ECMO support was maintained for 5 days, with cardiac recovery and decannulation.

Conclusions: The patient was discharged from the ICU after 20 days and discharged from the hospital after 38 days of admission, without sequels, with minimal assistance, in rehabilitation care.

Abstract: 320**Echocardiographic assessment of cardiac function in a pioneering animal model of cardiopulmonary failure**

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Objective: To comprehensively assess cardiac function by trans-epicardial echocardiography in a novel animal model of severe cardiopulmonary failure (CPF)

Methods: Three healthy female sheep (weight 62 ± 7.0 kg) were anesthetized, tracheally intubated and mechanically ventilated. An arterial catheter was placed for blood sampling and pressure monitoring. Left femoral artery and right jugular vein were cannulated and veno-arterial extracorporeal membrane oxygenation support commenced at a rate of 1.8 ± 0.5 L/min. A left mini-thoracotomy was performed to access the pericardial sac and we developed heart failure through fifty 1-mL ethanol injections into the left ventricle myocardium. Ventilatory support was substantially decreased to develop pulmonary failure. Cardiac function pre and post development of CPF was evaluated by trans-epicardial echocardiography (Philips IE-33, North Ryde, Australia) and analyzed by dedicated software (TOMTEC Imaging Systems GmbH, Germany). Due to the limited number of evaluated animals, only descriptive statistics was performed.

Results: CPF caused a drop in mean arterial pressure and oxygenation, which resulted in an upsurge of blood lactate level (Table 1). Of note, echocardiographic indexes of LV function, such as left ventricular (LV) fractional area change, global circumferential and radial strain similarly decreased, post development of CPF.

Conclusions: In an innovative animal model of CPF, epicardial echocardiography is a reliable and feasible mean to follow up dynamics of cardiac dysfunction.

Abstract: 327**Emergency CABG on VA following complex aortic dissection repair**

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Objective: We report a case of type A dissection repair complicated by ischaemic right ventricular failure following de-cannulation managed with coronary artery bypass grafting (CABG) under VA ECMO support.

Methods: A 51 presented with a type A aortic dissection from the root to iliac arteries. He underwent emergency root, ascending and arch replacement using a frozen elephant trunk technique with extra-anatomical bypass to the left subclavian artery. Cardiopulmonary bypass (CPB) was established by ultrasound guided cannulation of the ascending aorta true lumen and two-stage venous cannula via the right atrium (RA) with cold cardioplegia into the coronary ostia. Around one hour post de-cannulation from CBP, he developed inferior ST-elevation and severely right ventricular impairment. The working diagnosis was of ischaemia and shock team consulted as a further CPB run including cardioplegia