Introduction:
This study aims to describe the prevalence of neurologic complications and hospital outcome in adult post-cardiotomy cardiogenic shock (PCS) patients receiving veno-arterial extracorporeal membrane oxygenation (V-A ECMO) support and factors associated with such adverse events.

Methods:
415 adult patients underwent cardiac surgery and received V-A ECMO for more than 24h because of PCS. Patients were divided into two groups: those who developed a neurological complication and those who did not (the control group). Multivariable logistic regression was performed to identify factors independently associated with neurologic complications.

Results:
Neurologic complications occurred in 87 patients (21.0%), including cerebral infarction in 33 patients (8.0%), brain death in 30 patients (7.2%), seizures in 14 patients (3.4%), and intracranial hemorrhage in 11 (2.7%) patients. In-hospital mortality in patients with neurologic complications was 90.8%, compared to 52.1% in control patients ($p <0.001$). In a multivariable model, the lowest systolic blood pressure (SBP) level pre-ECMO (OR, 1.12; 95% CI: 1.08–1.17) and aortic surgery combined with coronary artery bypass grafting (OR, 9.22; 95% CI: 2.10–40.55) were associated with overall neurologic complications. Lowest SBP (OR, 1.22; 95% CI: 1.15–1.31) was the only risk factor of brain death as well. Coagulation disorders (OR, 9.75; 95% CI: 1.83–51.89) and atrial fibrillation (OR, 12.19; 95% CI: 1.22–121.61) were shown to be associated independently with intracranial hemorrhage, whereas atrial fibrillation (OR, 8.15; 95% CI: 1.31–50.62) was also associated with cerebral infarction.

Conclusion:
Neurologic complications in adult PCS patients undergoing VA ECMO support are frequent and associated with higher in-hospital mortality. Identified risk factors of neurologic complications might help to improve ECMO management and might reduce their occurrence.
Figure 5. Risk factors of neurologic complications during extracorporeal membrane oxygenation. SBP, systolic blood pressure; CABG, coronary artery bypass grafting.