

# Early circulatory mechanical support in refractory cardiogenic shock complicating subarachnoid hemorrhage

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Argomento: Neuroanestesia e neurorianimazione

## **CASE DESCRIPTION**

A healthy 51-year-old woman was conducted to the Emergency Room for a rapid onset severe headache. Upon her arrival, she had a cardiac arrest, advanced life support was started and the return of spontaneous circulation (ROSC) was quickly achieved.

CT scan showed subarachnoid hemorrhage (SAH), tetra-ventricular flooding, hydrocephalus and left posterior-inferior cerebellar artery aneurysm.

External ventricular drainage was placed and the patient was urgently centralized to our hospital for aneurysmal embolization: neurointerventional procedure was rapid, uneventful and effective.

Since the ROSC the patient suffered from rapid atrial fibrillation (130bpm), low blood pressure (80/60mmHg) and bad perfusion. Neither fluid challenge nor incremental norepinephrine infusion improved parameters.

Echocardiography showed severe impairment of ejection fraction (15%) in association with diffuse antero-septal ST segment depression.

N-terminal-pro-B type natriuretic peptide and high sensitive troponin T were both 5-fold the normal value.

Electrical cardioversion was successfully performed and adrenaline infusion started but hypotension persisted, lactates raised (1,93 to 8,4 mmol/L), oligo-anuria appeared.

Cardiac Index was 1 l/min/m<sup>2</sup>, pulmonary capillary wedge pressure 22mmHg. Refractory cardiogenic shock was diagnosed and pros and cons of different types of circulatory mechanical support were evaluated: Intra-aortic balloon-pump (IABP) was placed.

Hemodynamic parameters and perfusion drastically improved after counterpulsation and vasoactive drugs were gradually tapered. (Figure 1)

Cardiac function progressively restored and IABP was removed 72h after placement.

The course was thereafter favorable: normal cardiac function, no organ failure, no vasospasm,

complete neurological recovery, discharge to a rehabilitation facility.

## **DISCUSSION**

Up to 30% of SAH patients develop Takotsubo-like cardiomyopathy.

Haemodynamic instability, ECG changes, ventricular dysfunction and slightly elevated troponemia must make us suspect cardiac dysfunction.

Prompt detection and effective supportive care are essential, especially in more severe situations.

To our knowledge, this is the first case of early counterpulsation in refractory cardiogenic shock complicating SAH.

