Rapid ventricular pacing

<html><iframe width="560" height="315" src="https://www.youtube.com/embed/hr-2WDWSYZs" frameborder="0" allow="accelerometer; autoplay; encrypted-media; gyroscope; picture-in-picture" allowfullscreen></iframe></html>

Rapid ventricular pacing (RVP) is a procedure that temporarily lowers blood pressure by increasing heart rate and reducing ventricular filling time. RVP has been widely used to reduce blood vessel tension in many cardiovascular surgeries.

Rapid ventricular pacing (RVP) has recently been reintroduced into cerebrovascular surgery. It is more predictable than adenosine in response time and, thus, can be used during unanticipated complications, such as aneurysmal rupture. It also induces a shorter period of hypotension compared with adenosine. However, RVP is more invasive and more complex from an anesthesia standpoint. Vascular neurosurgeons should be familiar with these techniques and know their applications and limitations [1].

A 46-year-old man came to the Huashan Hospital Fudan University, Shanghai, China with intermittent right-side headache for 5 years, and left lower limb numbness for 3 months.

Magnetic resonance imaging (MRI) of the head and digital subtraction angiography confirmed the diagnosis of right middle cerebral artery (MCA) aneurysm.

Considering the large size of this MCA aneurysm, Rapid ventricular pacing (RVP) was used to reduce blood pressure during MCA aneurysm repair, and to lower the risk of intracranial hemorrhage during procedure.

Post procedure, there was no abnormality detected. Seven weeks after surgery, the patient's muscle tone of right side extremities were grade V and left side extremities were grade IV. Computed tomography angiography confirmed no MCA aneurysm.

In cases of aneurysm rupture, RVP will induce a transient “very low pressure” condition, and give a valuable time frame to clip the ruptured aneurysm. Therefore RVP is a safe and effective method to provide transient reduction of cardiac output in intracranial aneurysm patients [2].

1)
Rangel-Castilla L, Russin JJ, Britz GW, Spetzler RF. Update on transient cardiac standstill in cerebrovascular surgery. Neurosurg Rev. 2015 Oct;38(4):595-602. doi: 10.1007/s10143-015-0637-z. Epub 2015 May 1. PubMed PMID: 25931209.
2)
Ping Y, Gu H. A case report on middle cerebral artery aneurysm treated by rapid ventricular pacing: A CARE compliant case report. Medicine (Baltimore). 2018 Nov;97(48):e13320. doi: 10.1097/MD.0000000000013320. PubMed PMID: 30508924.