Introduction:
About 75% of cardiac output is directed to vessel-rich tissues. During acute hemorrhage, cardiac output is redistributed to tissues of higher metabolic activity. We describe a case of preserved cardiac output during acute surgical hemorrhage and sustained hypotension.

Case Report:
65 year-old male to undergo resection of a meningioma without prior embolization therapy.
Neurologic exam positive for mild aphasia/memory loss.
Lasix/mannitol given upon induction.
Propofol/remifentanil for maintenance.

Discussion:
Severe hypotension and global cerebral ischemia can lead to poor patient outcomes. Our patient had a positive neurologic outcome despite sustained hypotension, which can be attributed to several mechanisms:
1. The redistribution of the cardiac output to major organ systems as evidenced by a preserved EtCO$_2$. Intra-op hypotension can worsen outcome but studies have proved that a lower SBP during hemorrhage did not affect mortality. Functional or histologic brain damage was not seen in rats following hemorrhagic shock. Despite hypotension, perfusion to vital organs is adequate while decreased in other organ systems such as the splanchnic system.
2. Propofol offers cerebral protective effects through its action on GABA receptors, free radical scavenging, and limiting lipid peroxidation. It also attenuates the catecholamine surge seen during ischemia.
3. ICP reductions with the use of mannitol and lasix permit adequate CPP during sustained hypotension.

Conclusion:
Our patient’s survival and positive neurologic outcome after major blood loss and hypotension can be attributed to a few key cerebral protective mechanisms.
- Preservation of cerebral blood flow by redistribution during times of hypotension.
- Agents that promote cerebral protection by improving CPP and attenuating the cellular effects of ischemia.

References:
- Graph from: http://www.anesthesiawiki.net/metrohealthanesthesia/MHAnes/edu/neuro/icTumors1.htm

Pre-operative MRI images of the meningioma.

Positive neurological outcome after acute neurosurgical hemorrhage and sustained hypotension
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