# Awake craniotomy - the anaesthesiologist’s view

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A sudden fall in lung compliance, severe hypotension and tachycardia was seen. The patient required multiple boluses of a crystalloid and infusions of adrenaline and noradrenaline.
Other causes were ruled out clinically and by imaging. On withdrawing the catheter, the vaso-respiratory disturbance resolved completely and the patient was extubated.
After five days, the patient had a repeat embolisation. When her VGAM was approached via the vertebral artery, she had a transient fall in lung compliance but was haemodynamically stable.
**Discussion:** Autonomic reactions have been reported during superselective ophthalmic arterial chemotherapy for retinoblastoma treatment and included bradycardia, hypotension and a fall in respiratory compliance. They occurred when the catheter was in the ICA or the ophthalmic artery[2,3]. These may be due to stimulation of trigeminal afferents[3] and abrupt changes in peripheral pulmonary vascular resistance[3].
We did not note any bradycardia. Approaching the VGAM via the vertebral artery led to a fall in compliance but no haemodynamic disturbance.
**References:**
1. Jun Yan et al.Outcome and complications of endovascular embolization for vein of Galen malformations: a systematic review and meta-analysis.J Neurosurg.2015 Oct
2. Phillips,T. J. et al(2013).Autonomic cardio-respiratory reflex reactions and superselective ophthalmic arterial chemotherapy for retinoblastoma. Paediatr Anaesth, 23: 940-945.
3. Kato, M. A. et al(2015).A retrospective analysis of severe intraoperative respiratory compliance changes during ophthalmic arterial chemosurgery for retinoblastoma. Paediatr Anaesth, 25: 595-602.
**Learning points:**
1. Life-threatening vaso-respiratory disturbance can happen during ICA catheterisation which may resolve with removal of the catheter.
2. An autonomic pathway linking intracranial vasculature and the respiratory system needs further investigation.

## 06AP05-2

### Assessment methodology of brain functional status in the perioperative period in subarachnoid and parenchymal hemorrhage patients

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**Background:** A version of assessment methodology of brain functional status in spontaneous subarachnoid and parenchymal hemorrhage patients due to rupture of cerebral aneurysms was presented.
**Goal of Study:** Anesthesia, perioperative intensive therapy and brain functional status monitoring improvement in spontaneous subarachnoid and parenchymal hemorrhage patients.
**Materials and Methods:** 45 spontaneous subarachnoid and parenchymal hemorrhage as a result of cerebral aneurism rupture patients were examined. The severity of patients condition according to Hunt-Hess scale was equal to grade IV. The level of consciousness was GCS 6-8 points. Philips Brilliance CT computed tomography (CT scan), Philips AlluraXper cerebral angiography, Spiegelberg ICP-monitor and Spiegelberg Compliance-Monitorintracranial pressure (ICP), mean arterial pressure (MAP), cerebral perfusion pressure (CPP) invasive monitoring, INVOS - 4100 Somanetics cerebral oxymetry(CO), monitoring were performed. BIS monitoring for the adequacy of sedation, Nihon Kohden Corporation EEG-1200K for postoperative encephalography were used.
**Results and Discussion:** Selection method of anesthesia at such operations is general anesthesia based on sevoflurane with tracheal intubation and automatic lung ventilation in the mode of norm or moderate hyperventilation. Neuroprotective therapy: nimodipine, choline alfoscerate - was performed according to preoperative, intraoperative and postoperative neurophysiological data monitoring. Modern concepts concerning pathophysiology of spontaneous subarachnoid hemorrhage, course disease periods were taken into account.
In order to study the uniformity of edema-swelling of the white and gray brain matter and to determine the degree of their hydration in a various topical areas of the brain the CT scan analyzes was held.
**Conclusion(s):** It was revealed that the CT method enables to estimate the hyperhydration of white and gray brain matter. Intensive therapy with choline alfoscerate reduces the severity of the hydration of white and gray brain matter, reducing the effects of edema-swelling. Invasive ICP, MAP, CPP monitoring, cerebral oximetry and EEG is a highly neuromonitoring component, use of which helps to clarify the tactics of intensive therapy in subarachnoid and parenchymal hemorrhage patients.

## 06AP05-3

### Awake craniotomy - the anaesthesiologist's view

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**Background:** Compared with surgery under general anaesthesia (GA), awake craniotomy (AC) is associated with advantageous outcomes. It is standard of care for tumors in eloquent brain areas. For anaesthesiologist it is a challenge because there is no standardized anaesthestic technique.
**Clinical case-series:** During last three years, AC with monitored anaesthesia care (MAC) is successfully implemented in Croatia. We present single centre experience with thirteen patients (age 32-64 yrs; 7M, 6F; ASA II). After selection by multidisciplinary team patients were sedated and breathed spontaneously during the procedure.
We used target controlled infusion pumps for fine titration of remifentanil and propofol, and for local infiltration at the site of pin insertion, skin incision and nerve blocks mixture of 0.5% bupivacaine and 2% lidocaine with adrenalin. Monitoring included: ECG, invasive and non-invasive BP, SPO2, RR, ETCO2, BIS and hourly urinary output. There were no surgical, neither anaesthesiological complications. Maximum alert and minimally stressed patients were optimal for awake brain mapping.
**Discussion:** In anaesthetic management exists large variability and implementing AC is challenging for anaesthesiologist. Avoidance of GA prevents associated physiological disturbance, need for mechanical ventilation and utilization of anaesthetics that can play a role on antitumor immunity and tumor progression. It is difficult to differentiate the benefits related to anaesthetic care from those attributable to surgical technique. Using MAC, surgeon's credit is an ability to increase the extent of resection and survival, while preserving neurological function. Anaesthesiologist's credit is competence to avoid a complications of general endotracheal anaesthesia. Avoiding these factors may contribute to better outcome after AC.
Our experience shows patients' satisfaction (evaluated by psychologist), with optimal intraoperative working conditions for neurosurgeon.
**Learning points:** Crucial steps in establishment of an awake surgery is creation of a competent neuroanaesthesiologist, who are able to provide care for awake patients. Drugs fine titration, accurate respiratory function monitoring, good plan in dealing with possible respiratory complication and constant training in management of difficult airways are milestones of favourable outcome. In view of that, anaesthesiologist contribution to AC is essential.

## 06AP05-4

### Can we predict patient's panic attack during awake craniotomy?

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**Background and Goal of Study:** Intraoperative psychological disorder disturbs the surgical achievement of awake craniotomy. In spite of careful evaluation of the patients, psychological and physiological stress caused by surgery itself can trigger patient decline. However, the factors that correlate to panic