

Editorial

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Early Post-operative Surveillance after Brain Surgery

Bilotta Federico^{1,2*}, Guerra Carolina¹ and Rosa Giovanni¹

¹Department of Anaesthesiology, Critical Care and Pain Medicine, Sapienza University of Rome, Policlinico Umberto I, Rome, Italy

In the early postoperative phase after brain surgery, even after elective uncomplicated procedures, some clinical variables can affect brain perfusion and influence the outcome [1]. In these patients, safe discharge by the post anesthesia care unit is possible when physiologic variables return within normal values [2]. Nevertheless, to avoid postoperative complications it is mandatory a strict monitoring and thoughtful surveillance of qualified variables. Aim of this article is to highlight the clinical variables that qualify early postoperative phase after brain surgery and that -therefore- deserve close surveillance, including: hemodynamic, ventilation, neurologic and cognitive status, shivering, PONV, pain and metabolism.

Hemodynamic

The postoperative course of patients undergone brain surgery is often complicated by arterial hypertension due to sympathetic overdrive [3-5]. When cerebral auto-regulation is disturbed, arterial hypertension can result into direct increase of Cerebral Blood Flow (CBF) that can lead to high intracranial pressure, cerebral edema and intracranial hemorrhage [1,3,5]. In patients undergone elective craniotomy, thigh monitoring of arterial pressure and thoughtful titration of anti-hypertensive drugs -including short acting beta blockers or calcium channel blockers- can effectively blunt the postoperative sympathetic overdrive [4,5]. Infusion of nitrates-based drugs, including nitroglycerin and nitroprusside, should be avoided in these patients, because of the direct cerebral vasodilatation and intracranial hypertension [5].

Ventilation

Reduced ventilation -with increase in PaCO_2 values and reduction in Ph values- that sometime complicates the postoperative course due to residual effects of anesthetic drugs, is especially dangerous after craniotomy because of the tight relationship between blood-gas analysis (BGA) values and CBF increases by 3% for each increase in PaCO_2 mmHg [6]. Surveillance of ventilatory function and BGA is therefore necessary to prevent complications related to CBF increase.

Neurologic and Cognitive Status

Neurologic and cognitive status at patients arrival in the duty should be immediately evaluated and recorded since the loss of a neurological and/or cognitive ability might represent the initial sign of intracranial postoperative bleeding [2,7]. Surveillance of these functions should be performed on a pre-defined time schedule and according a systematic approach. Subjective evaluation, when not supported by objective criteria (i.e. delay/inability to obey commands, lack of ability to move a limb, differences in pupils diameter, etc), can lead to a substantial underestimate.

Shivering

The appearance of postoperative shivering frequently complicates the postoperative course after brain surgery [5,8]. This complication is associated with a significant increase in blood oxygen extraction and in intracranial pressure; it therefore can lead to reduced brain perfusion. These patients deserve special attention to intra and postoperative normothermia that should be ensured, along with repeated/continuous core body temperature control, with active warming when needed.

Postoperative Nausea and Vomiting (PONV)

Occurrence of PONV after brain surgery is an especially serious complication since it might lead to aspiration and increase in intracranial pressure [9]. This complication should be prevented, by minimizing favoring factors, especially in high risk patients. These patients (female gender, patients with a previous episode of PONV, patients with infratentorial lesions, non-smoking status, motion sickness disorder, etc) should be recognized right from hospital arrival and prophylactic regimen (use of short rather than long acting opioids, adequate fluid therapy, antiemetic medications, etc).

Pain

Occurrence of pain in the postoperative period after brain surgery is sometimes overlooked [5,10-12]. Prevention of this serious complication is mostly associated with appropriate perioperative management, including the use of local anesthetics for scalp block in the intraoperative period, and adequate nociceptive therapeutic regimen. The use of NSAIDs after brain surgery is controversial because of the potential risks related to reduce platelet aggregation effects of these drugs and the potential to facilitate or worsen intracranial hemorrhage [10]. Opioids are effective, but should be used cautiously because of the possible effects on ventilator drive, consciousness and because can facilitate the occurrence of PONV.

Metabolism

Adequate nutrition and hydration is of paramount importance after intracranial surgery, because the brain only metabolizes glucose. The blood glucose concentration (BGC) should be kept within strict limits (not higher than 180 mg/dl or not below 80 mg/dl) [13-15]. In these patients the use of glucose-enriched solution (5/10% glucose solutions) should be avoided, because it can provide free water that contributes to brain edema formation. In these patients fluid therapy should be limited to iso-osmolar solutions (0.9% saline) and nutrition guaranteed by using high protein enteral or parenteral solutions. Tight BGC monitoring with repeated whole blood BGC measurements should be performed [13-15].

In conclusion, some clinical variables -including hemodynamic, ventilation, neurologic and cognitive status, shivering and PONV, metabolism- are especially relevant after brain surgery and deserve to be strictly monitored. A qualified surveillance of these variables and a tight communication between health care professionals can significantly contribute to improve the post-operative outcome of patients undergone brain surgery [16].

***Corresponding author:** Federico Bilotta, Department of Anesthesiology, Critical Care and Pain Medicine, Sapienza University of Rome, Italy, and Professor of Clinical Anesthesiology at the Albert Einstein College of Medicine, The Bronx, New York, NY, USA. E-mail: bilotta@tiscali.it

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