The Department of Anesthesiology
Faculty of Medicine
Université de Montréal

Anesthesiology Rounds
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Intracranial Hypertension in the Perioperative Period

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Objectives:

- To describe the physiopathology of intracranial hypertension in the perioperative context and discuss the mechanisms that compensate for an increase in intracranial volume
- To discuss the concept of secondary cerebral damage
- To plan anesthesia for a patient with intracranial hypertension
- To develop a diagnostic and therapeutic approach for the "brain under pressure"
- To discuss osmotic agents in a perioperative setting

Questions: (Only one response is correct)

1. Concerning cerebral physiology:
    a) Intracranial pressure varies linearly and proportionally with intracranial volume.
    b) With normal autoregulation, a reduction in mean arterial pressure causes cerebral arterial vasodilatation.
    c) Autoregulation is defined as the relationship between $PaCO_2$ and cerebral blood flow.
    d) Cerebral perfusion pressure is defined as the difference between systolic blood pressure and intracranial pressure.
    e) The autoregulation curve shifts to the left in chronically hypertensive patients.

2. Which of the following statements about anesthetic drugs is true?
    a) Propofol increases cerebral perfusion pressure.
    b) Halogenated agents undo the relationship between cerebral metabolism and cerebral blood flow.
    c) Desflurane abolishes autoregulation at a concentration of 1.5 MAC.
    d) Succinylcholine should be completely avoided in patients with intracranial hypertension.
    e) Halothane sharply reduces critical cerebral blood flow.

3. Concerning the treatment for intracranial hypertension:

a) Only a high dose of furosemide (1 mg/kg) has a synergic effect with mannitol.

b) Hypertonic saline is the osmotic agent of choice in the perioperative period.

c) The hematoencephalic barrier allows for fluctuations in osmotic pressure, which explains why osmotic agents are so effective.

d) Mannitol is known to be an antioxidant.

e) It is important to keep patients with intracranial hypertension slightly dehydrated to prevent any rise in intracranial pressure.

4. When faced with a brain under pressure, it is necessary to:

a) Start by quickly hyperventilating the patient.

b) Reduce the patient's blood pressure to cause cerebral arterial vasoconstriction, thereby reducing the intracranial pressure.

c) Stop the administration of any halogenated agent, regardless of the dosage used, and administer an intravenous agent.

d) Administer an extra dose of mannitol, which will act very quickly.

e) Ideally, carry out several therapeutic procedures simultaneously.

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