Acute Cardiac Bradyarrhythmias during Pituitary Surgery: What Should We Know?

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Surgery of the pituitary tumor poses unique challenges to neuroanesthesiologists and neurosurgeons owing to associated intraoperative hemodynamic disturbances. We report a case of acute cardiac arrhythmia causing hemodynamic disturbances that occurred due to pituitary surgery and detail the measures taken during its management.

A 28-year-old female, weighing 55 kg, was diagnosed with nonfunctional pituitary macroadenoma with apoplexy and was scheduled for transnasal, transphenoidal endoscopic resection. Her primary complaints were diminished visual acuity, galactorrhea, amenorrhea, headache, and vomiting. She did not have any cardiorespiratory abnormality, and her systemic examination and routine investigations were normal. The standard general anesthesia technique was followed. For induction, morphine 6 mg, propofol 2 mg/kg, and vecuronium 1 mg/kg were used, and maintenance of anesthesia was achieved using oxygen-nitrous oxide-desflurane mixture along with intermittent doses of vecuronium. Intraoperatively, following an initial 1.5 hours of stable hemodynamics, the patient’s heart rate suddenly dropped to ≤40 beats per minute, with sinus rhythm and normal QRS morphology in electrocardiogram associated with drop-in invasive blood pressure. The surgeon was informed immediately; further stimulus was stopped and surgery restarted after normalization of vitals. A similar event occurred during endoscopic transsphenoidal surgery while manipulation of carotid vessels, dural stretching, manipulation of the hypothalamic region, stimulation of the trigeminal nerve, acute hydrocephalus, sudden blood loss, and venous air embolism. In our case, there were no signs of inadequate anesthesia/analogies, sudden blood loss, hypothermia, and fall in end-tidal carbon dioxide. Acute hydrocephalus can cause hypertension and bradycardia through Cushing’s response, but it was unlikely in our case as there was bradycardia with hypotension. Hence, the most probable event responsible for sudden bradycardia and hypotension in our case was because of the activation of a trigeminal cardiac reflex (TCR) through optic chiasmal compression, which further supported by a cause–effect relationship.

TCR is a well-known biological reflex. Coexisting risk factors such as hypoxia, hypercarbia, acidosis, young age, a lighter plane of anesthesia, strong and prolong provoking stimulus, and preoperative medications can render patients more vulnerable to TCR in the perioperative phase. Stimulation of divisions of the trigeminal nerve during its intracranial course can cause bradycardia and/or asystole due to TCR in transphenoidal surgeries. Sudden bradycardia, hypotension, apnea, and gastric hypermobility are manifestations of the TCR. There are two forms of TCR (i.e., peripheral and central) described that cause bradycardia with acute blood pressure changes. However, peripheral TCR (triggered through the extracranial part of the trigeminal nerve) can cause hypertension as compared with hypotension in central TCR (triggered through central divisions of the trigeminal nerve including Gasserian ganglion).

Life-threatening events following TCR occurs rarely, but during the literature search, we found one similar case published by Chowdhury et al where three episodes of bradycardia occurred during endoscopic transphenoidal surgery while...
operating near optic chiasma, the patient developed vision loss in the postoperative period, and hematoma was seen on imaging in the sellar region compressing the optic chiasma, which required evacuation. Thus, indicating that intraoperative TCR may act as a warning indicator and may predict surgical outcome albeit in our case postoperative course was uneventful unlike reported by Chowdhury et al.

Through this case report, we want to highlight that TCR is mostly a benign biological reflex, but the neuroanesthesia team should be vigilant of its occurrence. Proper communication and meticulous surgical dissections while operating in or near the optic chiasma will improve the overall success rate of the surgery.

Conflict of Interest
None declared.

References
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