Intra-Operative Ventricular Bigeminy: Can Retractor Be a Cause

Sir/Madam,
A 40 yrs old female was admitted to ICU with history of high velocity road traffic accident with polytrauma in unconscious state with GCS-6. On examination pupils were bilaterally dilated with sluggish reaction to light. She had head injury, lower limb and pelvic fractures. She was put on ventilator with full support. There was no previous history of cardiac illness. Her CT scan head showed multiple contusions, ECG revealed normal sinus rhythm, chest X-ray showed bowel loops shadow in left hemithorax with mediastinal shift to the right and findings confirmed on CT-scan Chest. Haematological and biochemical profiles were normal. Central venous catheter was inserted and CVP monitored. Patient was taken up for diaphragmatic injury repair under GA through an abdominal approach.

She was given Glycopyrollate 0.2 mg i.m. before being transferred to the operation theatre Inj. Pentazocine 30 mg, Vecuronium 4 mg iv were given and patient put on ventilator. Anaesthesia was maintained with N₂O 67% in O₂, Isoflurane and Vecuronium. On laparotomy, a 10 cm rent was seen in left hemi diaphragm with herniation of stomach and small bowel loops. After the reduction of abdominal contents diaphragm was repaired. During the repair sudden continuous bigeminy were noticed on the monitor. SPO₂, BP , EtCO₂ and CVP were normal at that time. N₂O and Isoflurane were switched off and patient was given 100% O₂, bigeminy continued. Surgeon was informed and asked to stop the repair for a while following which sinus rhythm reappeared. (Fig. 1). Again on start of repair after some time bigeminy appeared. Cardiac and pericardial handling was ruled out. It was noticed that the moment Deaver retractor was applied the ventricular bigeminy appeared. It was a technically difficult repair as the rent was close to the pericardium and could not be repaired without the use of Deaver retractor.

With caution the diaphragm was repaired and after the surgery patient shifted back to the ICU on full support elective ventilation. In ICU continuous ECG monitoring was done on which no arrhythmia appeared thereafter. Patient was discharged from the hospital on 35th post-operative day.

Ventricular arrhythmias have been reported with blunt and penetrating trauma to the chest associated with cardiac injuries.Acute onset ventricular bigeminy carries an increased potential for haemodynamic instability including ventricular fibrillation or cardiac asystole. Hence it requires a prompt diagnosis and treatment. Intra-operative bigeminy has been reported with rheumatic heart diseases, hypokalaemia, inadequate analgesia and old age.

Ventricular bigeminy is a cardiac arrhythmia in which there is a premature ventricular contraction (PVC) alternating with a normal sinus beat. On ECG, bigeminy is manifested as a normal QRS complex followed by an abnormal QRS. The character of peripheral pulse felt during bigeminy is called pulsus bigeminus, perceived either as extra beats or missed beats.

Pre-existing heart disease is a known cause of peri-operative cardiac arrhythmias. Our patient had no history suggestive of any heart disease and had a normal pre-operative ECG. Also there was no injury to heart or pericardium as suggested by pre-operative normal haemodynamics and CT-Chest. Hence possibility of cardiac cause was ruled out.

Another important cause of intra-operative cardiac arrhythmias is raised intracranial pressure. Our patient had head injury with multiple contusions. Isoflurane is the inhalational anaesthetic agent of choice in head injury patients as it causes minimal increase in ICP. CVP remained stable throughout the surgery. Undesirable rise in ICP can occur with patient's movement or any noxious stimulus under inadequate anaesthesia. Depth of anaesthesia was adequate in our patient as capnograph was normal, there was no movement of patient.

Volatile anaesthetics can cause cardiac arrhythmias. Isoflurane has less arrhythmogenic potential than halothane. We withdrew the possible offending agent but bigeminy continued. Other causes of cardiac arrhythmias include hypoxia, hypercarbia, hypokalemia. Arterial oxygen saturation and end tidal CO₂ remained normal at the time of occurrence of bigeminy.

In our case we found that the cause of ventricular bigeminy was the application of Deaver retractor in close proximity to the heart which might have progressed to more severe and fatal arrhythmias if gone unnoticed.

In conclusion, this case reemphasizes vigilant role of the anaesthesiologist in such surgeries.

REFERENCES

1. Z. Witkowski et al. Pericardiodiaphragmatic rupture and cardiac herniation after multiple blunt trauma: Diagnostic
Dear Sir,

Mallampati class zero airway, described as 'visible epiglottis upon mouth opening and tongue protrusion', is a recently popularised entity in adults, with a reported incidence of approximately 1.18%.1 It is infrequently reported in children.2,3 Two anaesthetic procedures with Mallampati zero airway have been reported in a 9-yr-old boy.2 Both endotracheal intubation and insertion of laryngeal mask airway was easy in this child. Another 6-yr-old boy with class zero airway on preoperative examination has been reported, but, he did not undergo any surgery.3 Mask ventilation, laryngoscopy, and tracheal intubation in children with class zero airway may be challenging, due to associated stiff and elongated epiglottis in paediatric patients. We report our anaesthetic experience in a 5-yr-old child; probably the youngest reported till date, with a Mallampati zero airway. This girl weighed 22 kg and was scheduled for laminectomy and release of tethered spinal cord under anaesthesia. Airway examination revealed visible epiglottis (Fig 1). Rest of the clinical examination was unremarkable. Anaesthesia was induced with fentanyl and propofol. Laryngoscopy was performed using a curved Macintosh blade # 2 which revealed a grade I laryngoscopic view. The airway was secured in first attempt with uncuffed 5.0 mm I.D orotracheal tube. The perioperative course was uneventful.

A higher probable incidence of class zero airways has been suggested in children owing to anteriorly placed larynx. 4 However, no data is available at present to substantiate this claim. In adults, experience of variable airway difficulties has been reported in relation to class zero airway.1,5 However, such problems were never encountered in managing paediatric class zero airways reported till date, including this case. Hence, larger studies would be required to know the exact incidence and associated difficulty, if any, in managing this unique paediatric airway.

REFERENCES

1. Ezri T, Warters RD, Smuk P , et al. The incidence of class “zero” airway and the impact of Mallampati score, age, sex, and body mass index on prediction of laryngoscopy grade. Anesth Analg 2001; 93: 1073-1075.
2. Okomato E, Sakuragi T, Sugi Y, Shono S, Higa K. Endotracheal intubation and a laryngeal mask airway in a child with Mallampati class zero airway. Anesth Analg 2004; 98: 557.
3. Brull R, Caplan JA. Pediatric class zero airway. Can J Anaesth 2004; 51; 947-948.
4. Ezri T, Warters RD, Szmuk P. In response: A further consideration on Mallampati class and laryngoscopy grade. Anesth Analg 2002; 95: 783.
5. Fang B, Norris J. Class zero airway and laryngoscopy. Anesth Analg 2004; 98: 870-871.

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