



PERIOPERATIVE STROKE IN A PATIENT POSTED FOR TOTAL PROCTOCOLECTOMY – A CASE REPORT STUDY

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ABSTRACT Perioperative stroke is associated with high morbidity and mortality in patients undergoing a major surgery. Though perioperative stroke is common with cardiac, neurological and vascular surgeries, its occurrence in general surgery patients cannot be overlooked. We present a case of perioperative stroke diagnosed post operatively in a patient who underwent total proctocolectomy with end ileostomy for carcinoma colon. With prompt diagnosis and treatment, we were able to manage patient's condition successfully.

KEYWORDS : Perioperative stroke, Carotid artery stenosis, Hypoxic brain injury, Acute systemic inflammatory response, proctocolectomy.

INTRODUCTION

Incidence of Perioperative stroke in cardiac, neurological and carotid surgeries, is found to be as high as 2.5 – 5.2% (Wong GY, 2000), however, other surgeries carry a minimal risk of perioperative stroke which is 0.05%. Some prospective studies have shown the incidence to be as high as 4.4% (Turnipseed WD, 1980). Mortality from perioperative stroke in general surgery is found to be as high as 26% (Parikh S, 1993). As there are no specific parameters or tests to predict an acute ischemic stroke in patient with no related comorbidities undergoing general surgery, it is a challenging task to avoid the incidence of such complications.

CASE STUDY

A 62 year old 75 kg male presented with history of loose stools for a period of 6 months. He was known hypertensive on regular medications (Tablet Amlodipine 2.5mg OD). He was a smoker (15 pack years) and had history of alcohol abuse of 25 years for which he was on alcohol de-addiction treatment (Tablet baclofen 30mg HS) for the past two months. He was evaluated by gastroenterology team. Colonoscopic findings showed suspected carcinoma rectum with multiple colonic polyps and Computed Tomography (CT) scan showed carcinoma colon Grade 3B. Biopsy of the tissue/polyp confirmed adenocarcinoma of colon. Patient was posted for laparoscopic assisted total proctocolectomy by surgical oncology team. Preoperative thromboprophylaxis was deferred as the risk of bleeding outweighs thrombosis. (Guidelines on Perioperative Management of Anticoagulant and Antiplatelet Agents, 2018)

Preoperative anaesthetic evaluation was done where the patient was found to have history of hypertension, alcohol abuse and smoking, as mentioned above. Physical and systemic examination was unremarkable and vital parameters were within normal limits. On investigation, haemoglobin was 9.8mg/dl, which was optimized with blood transfusion.

Patient's past surgical or anaesthetic history was insignificant. Cardiologist and pulmonologist opinion was sought and patient was cleared for surgery under moderate risk. Patient was reviewed by Anaesthesiologist and was taken up for surgery (laparoscopic assisted/ open total Proctocolectomy + End Ileostomy) under moderate risk of Anaesthetic complications (ASA Grade – 2). General anaesthesia with epidural analgesia was planned for this surgery.

Epidural catheter was inserted at the level of L1 Vertebra, for continuous infusion of analgesia. Patient was induced with Propofol, Fentanyl and paralysis was achieved with non-depolarizing muscle relaxant, atracurium. Anaesthesia was maintained with IPPV (intermittent positive pressure ventilation), Isoflurane + Air / Oxygen mixture + intermittent boluses of atracurium. Multimodal analgesia was administered using Morphine and Paracetamol. Laparoscopic assisted total proctocolectomy + End ileostomy was performed. Intraoperative hemodynamics were stable with adequate urine output

maintained throughout. Patient was shifted to Surgical Intensive Care Unit (SICU) for elective mechanical ventilation in view of prolonged surgery (13 hours). Sedation was continued over-night for patient's comfort and to facilitate synchronous ventilation.

On post-operative day 1, sedation was stopped, patient was weaned off ventilator and extubated. Following extubation, right upper limb and lower limb weakness were noted (new onset neurological deficits) and stroke was suspected. Magnetic Resonance Imaging screening of brain was done which showed features suggestive of left Middle cerebral artery territory infarction with marked left cerebral hemisphere oedema, minimal midline shift and haemorrhagic transformation. Diffusion restriction in right high posterior fronto-parietal lobe was noted which was suggestive of acute infarcts (? Embolic). Diffuse cerebral atrophy and chronic ischemic changes were also present. Computed Tomography of brain with angiography of internal and external carotid artery showed signs of Eccentric atheromatous hypodense plaque in left mid-distal Common Carotid Artery causing moderate luminal stenosis with extension of plaque into left carotid bulb and proximal External Carotid Artery. Eccentric calcified plaque was present in right carotid bulb causing mild luminal stenosis. Diffuse atherosclerotic changes of bilateral Common Carotid Artery and Distal internal carotid artery (Left side >Right side) were noted along with right fetal Posterior Cerebral Artery. Neurologist opinion was sought and patient was started on antioedema measures and antiepileptics. On post-operative day 2 patient sensorium deteriorated, and was reintubated in view of low Glasgow Coma Scale (GCS) score. Repeat CT scan of brain showed sub-acute infarct involving the left Middle Cerebral Artery territory, right frontal lobe and genu of the corpus callosum with mass effect and midline shift to right, effacement of the adjacent sulcal spaces and left lateral ventricle with minimal left uncal herniation. Neurosurgery opinion was sought who advised for emergency decompression. Patient underwent Left fronto-temporo-parietal decompressive hemicraniectomy with lax duroplasty using G-patch and shifted to ICU for elective ventilation. He was gradually weaned off from the ventilator and extubated. Patient was shifted out of ICU on post-operative day 9 (of post bowel resection). Patient was discharged from the ward with advise of home physiotherapy and regular follow-up.

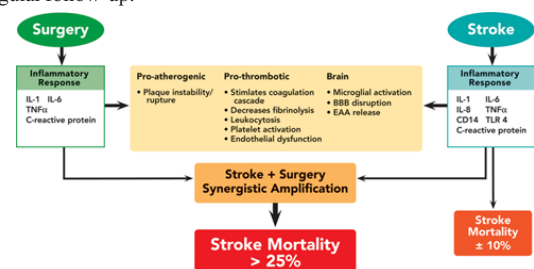


Figure 1 Pathophysiology of perioperative stroke. BBB = blood brain

barrier; CD = cluster of differentiation; EAA = excitatory amino acids; IL = interleukin; TLR = Toll-like receptor; TNF α = tumour necrosis factor α . (Julie L. W. Ng, 2011)

DISCUSSION

The case presented here describes unexpected complications of major stroke perioperatively after laparoscopic total proctocolectomy. Risk factors which could have contributed for Cerebrovascular accident (CVA) were old age, malignancy, prolonged surgery, smoking, hypertension. Although patient had no previous history of stroke, sudden onset of left cerebral infarct pushed him for second major surgery (decompressive craniectomy), prolonged ICU stay and severe morbidity.

Literature attributes the reasons for perioperative cerebrovascular accident to the increased inflammatory activity (MS, 2010) (McColl BW, 2009) outside the brain (figure 1). Acute systemic inflammatory response triggered by surgery exacerbates thrombotic events leading to ischemic cerebral injury. Though the exact etiology of this stroke is not known, previously existent thrombotic plaque in common carotid artery would have contributed in embolic event leading to stroke. The role of extracranial carotid artery stenosis in perioperative stroke remains controversial. (Bateman BT, 2009), (M, 2007) Hence patient was not screened for atherosclerotic abnormalities preoperatively. Physical examination such as, looking for Carotid bruit also does not correlate with the severity of the underlying carotid artery stenosis *per se* and has not been to be significantly associated with perioperative stroke. (Hart R, 1982), (Ropper AH, 1982) Even in patients with significant carotid artery stenosis who undergo cardiac surgery, strokes are often contralateral to the affected carotid artery and therefore cannot be attributed to the stenosis alone. (Naylor AR, 2002), (Li Y, 2009) However, similar data on stroke in non-cardiac and non-neurosurgical patients are currently lacking. The risk of perioperative stroke in patients with intracranial cerebral artery stenosis has not been stratified yet, but these patients carry a much higher risk (15% each year) of stroke in the nonsurgical scenarios, and therefore possibly in the perioperative period as well. (Chimowitz MI, 2005)

Preventive strategies which can lower the risk of perioperative stroke include, perioperative care like thorough pre-operative evaluations and management of risk factors so that primary and secondary stroke can be avoided. The main issues which have to be addressed as a preventive measure are cessation of smoking, anticoagulation for Atrial Fibrillation (AF), antihyperlipidemic medications, and glycaemic control. Preoperative carotid artery revascularization is needed in patients with greater than 70% symptomatic carotid stenosis, in the form of carotid stenting, or endarterectomy. Whereas in patients with less than 50% stenosis, intervention is not recommended. (Liapis, 2009) In patients with pre-existing stroke, it is recommended to delay non cardiac elective surgery for at least 1 month. (Mehdi, 2016) Statins should be continued perioperatively as they have beneficial effects like anti-inflammation, apart from preventing secondary stroke. Statins can be initiated 2 weeks prior to surgery in case of higher risk of acquiring primary stroke. Anti-platelets except aspirin is withheld before surgery and can be bridged to Unfractionated heparin or Low Molecular Weight Heparin (LMWH) as recommended. Similarly, Anti-thrombotic agents can be bridged to unfractionated Heparin or LMWH. Cerebral oximetry and jugular bulb venous oximetry can be used in monitoring intraoperative CVA events. Carotid duplex ultrasonography may identify significant carotid disease in high-risk patients (Stamou SC, 2001) perioperatively.

As 30% decrease in mean arterial pressure from immediately preoperative baseline is associated with ischaemic stroke within 10 days of general surgery, and hence prompt maintenance of perioperative blood pressure is important (Bijker JB, 2012). Recommended levels of glucose levels perioperatively are < 180mg/dl (Chiao SS, 2015). Hyperglycaemia has deleterious effect on brain tissue as it augments brain injury (Kim J, 1995). Studies have shown an increased risk of stroke in patients on perioperative metoprolol compared to more selective beta blockers like atenolol and bisoprolol (Sanders RD, 2015). Similarly Angiotensin Converting Enzyme inhibitors (ACEI) have also shown to cause intraoperative refractory hypotension, hence considering the risks and benefits, ACEI can be avoided as needed. Other neuroprotective strategies which can be considered are, use of thiopentone, isoflurane, sevoflurane, magnesium and hypothermia. (F. Bilotta, 2013)

CONCLUSION

Perioperative stroke can result in significant morbidity and mortality in patients undergoing major surgery. A thorough pre-anaesthetic evaluation with emphasis on detailed neurological history and examination in patients with risk factors for perioperative stroke, will help in early stroke workup preoperatively. Prophylactic initiation of anticoagulant/antiplatelet medications preoperatively considering the risks and benefits, may help in mitigating the incidence of such complications.

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