Dear Editor,

A 74-year-old male patient with bilateral carotid artery stenosis was posted for right carotid endarterectomy (CEA) as he was symptomatic for right artery stenosis (65% stenosis at carotid bulb). General anesthesia (GA) with multimodal neuromonitoring was planned for this patient. We monitored electroencephalography (EEG), transcortical motor evoked potential (tcMEP), somatosensory evoked potential (SSEP), and bilateral cerebral oxygenation using bifrontal near-infrared spectroscopy (NIRS). Anesthesia was maintained using effect-site target-controlled propofol infusion at 2 µg/mL, intermittent fentanyl boluses, and sevoflurane with MAC of 0.3–0.4. Baseline tcMEP, median SSEP, and EEG were recorded [Figure 1a].

During the arteriotomy following the carotid clamping, contralateral MEP disappeared. However, SSEP and EEG frequencies did not change [Figure 1a]. Therapeutic rise of blood pressure and placing arterio-arterial shunt did not normalize tcMEP. Ten minutes into the surgery, left median nerve SSEP amplitude reduced >50% and EEG revealed right ischemic changes [Figure 1b and c]. NIRS values remained same (in the range of 65%–70%) as baseline. Arterial plaque was removed and surgery was completed. Total duration of surgery was 2 h. Immediate postoperative MR-angiography revealed non-visualization of right distal ICA [Figure 1d] with watershed infarcts. Digital subtraction angiography revealed proximal right ICA dissection with slowing of distal flows [Figure 1e] for which stenting was done and tirofiban infusion was started. Following stenting, the distal ICA flows...
resumed sparing few terminal MCA territories [Figure 1f]. Patient was extubated on postoperative day 6, and discharged on day 20 with left-sided weakness (Medical Research Council score of 1/5 in upper and 4/5 in lower limb) and Modified Rankin Scale score of 3.

Time and again the available literature suggest the utility of tcMEP over or along with the SSEP and EEG monitoring during CEA under GA.\[1-3\] Although the role of SSEP and EEG is well established,\[4,5\] recent studies show favorable results with the use of tcMEP in CEA under GA.\[1-3\] We observed instantaneous loss of contralateral MEP, whereas SSEP and EEG changed only after 10–15 min after MEP loss. Distinct intraoperative MEP changes in this case allowed the rapid diagnosis of the intraoperative complication, to take preventive measures to reduce further ischemia and orchestrate the subsequent immediate postoperative course of action. This in turn saved the patient, who may have had worst prognosis in the absence of early diagnosis. Though EEG and SSEP are considered as the standard neurophysiological monitoring during CEA, utility of MEP cannot be overemphasized.

Financial support and sponsorship
Nil.

Conflicts of interest
There are no conflicts of interest.

ROHINI M. SURVE, SUPARNA BHARADWAJ, DWARAKANATH SRINIVAS, ANJU JL
Departments of Neuroanaesthesia and Neurocritical Care, and Neurosurgery, National Institute of Mental Health and Neurosciences, Bengaluru, Karnataka, India

Address for correspondence: Dr. Rohini M. Surve, Department of Neuroanaesthesia and Neurocritical Care, Neurocentre Faculty Block, 3rd Floor, National Institute of Mental Health and Neurosciences (NIMHANS), Hosur Road, Bengaluru, Karnataka - 560 029, India.
E-mail: rohinigondhule@gmail.com

Submitted: 09-Apr-2021, Accepted: 11-Apr-2021, Published: 02-Sep-2021

References
1. Malcharek MJ, Ulkatan S, Marinó V, Geyer M, Lladó-Carbo E, Perez-Fajardo G, et al. Intraoperative monitoring of carotid endarterectomy by transcranial motor evoked potential: A multicenter study of 600 patients. Clin Neurophysiol 2013;124:1025-30.
2. Uno M, Yagi K, Takai H, Oyama N, Yagita Y, Hazama K, et al. Comparison of single and dual monitoring during carotid endarterectomy. Neurol Med Chir (Tokyo) 2021;61:124-33.
3. Alcantara SD, Wuamett JC, Lantis JC, Ulkatan S, Bamberger P, Mendes D, et al. Outcomes of combined somatosensory evoked potential, motor evoked potential, and electroencephalography monitoring during carotid endarterectomy. Ann Vasc Surg 2014;28:665-72.
4. Nwachuku EL, Balzer JR, Yabes JG, Habeych ME, Crammond DJ,
Dear Editor,

Lung isolation and one-lung ventilation are fundamental to modern thoracic surgical and anesthetic practice.\[1,2\] The need for timely lung resection surgery for patients with lung cancer continues throughout the COVID-19 pandemic. However, there is an increased risk of viral exposure during thoracic surgical procedures, due to the need to perform frequent intra-operative aerosol-generating procedures (AGPs).\[3-5\]

The Association for Cardiothoracic Anaesthesia and Critical Care and the Society for Cardiothoracic Surgery in Great Britain and Ireland recently endorsed recommendations for the management of airway and lung isolation for thoracic surgery during the COVID-19 pandemic. These recommendations discuss modifications of existing techniques for the alleviation of risk of AGP to ensure the safety of healthcare workers and the patients.\[6\]

Flexible bronchoscopy remains the gold standard for the confirmation of double-lumen tube (DLT) position.\[7\] However, this is an AGP. Therefore, clinical methods, such as visual inspection and auscultation may be used to confirm the correct placement of the DLT. However, clinical confirmation has been shown to have poor sensitivity.\[7\]

We recommend the use of fluoroscopy to confirm the position of the DLT or bronchial blockers to minimize the risk of AGP. The use of fluoroscopy for DLT placement and confirmation has previously been reported.\[8-9\] Fluoroscopy allows placement and adjustment of the DLT in real time. It also allows the visualization of the entire length of the tracheal tube and storage of the captured images. Image intensifiers are commonly available in operation theatres and do not require sterilization between cases. When consecutive procedures are performed, sharing of the bronchoscope without proper sterilization can be a potential source of contamination. Meanwhile, the use of single-use flexible bronchoscopes has cost implications. Moreover, unlike the use of flexible bronchoscopes, fluoroscopic imaging does not require additional training.\[8\]

This technique has been recommended for the placement of DLT when there is bleeding in the trachea or primary bronchi, and bronchoscopic visualization is not possible.\[9\] Pediatric bronchoscopes (3 mm) cannot be used in patients below the age of 2 years, and fluoroscopy is invaluable in confirming lung isolation in these patients.\[10\]

The main concern with fluoroscopy-guided DLT placement is the risk of radiation exposure. Calenda et al. measured the dose of ionizing radiation at the exit of ionizing chamber. They found that the average radiation exposure was 0.0043 mGy.m\(^2\) (0.0005–0.035 mGy.m\(^2\)) and the mean duration of the procedure was 8 min (5–35 min). The longest duration for DLT placement in their study was 35 min, where they found the exposure to radiation was equivalent to that of two chest X-rays.\[8\]

We have frequently used fluoroscopy to confirm the position of DLT and bronchial blockers with good results. Lung