Somatosensory and Motor Evoked Potential Monitoring in a Patient of a Spinal Tumour at Lumbar Level under Total Intravenous Anaesthesia- A Case Report

Aparna Ruparel[1], Shilpa Kanakam[2], Azra Zahoor Kakroo[3], Shruti Hazari[4], Snehlata Tavri[5]

[1]Department of Anaesthesia, Dr DY Patil Medical College, Hospital, Nerul, Navi Mumbai, Maharashtra, India.
[2]Department of Anaesthesia, Dr DY Patil Medical College, Hospital, Nerul, Navi Mumbai, Maharashtra, India.
[3]Department of Anaesthesia, Dr DY Patil Medical College, Hospital, Nerul, Navi Mumbai, Maharashtra, India.
[4]Department of Anaesthesia, Dr DY Patil Medical College, Hospital, Nerul, Navi Mumbai, Maharashtra, India.
[5]Department of Anaesthesia, Dr DY Patil Medical College, Hospital, Nerul, Navi Mumbai, Maharashtra, India.

PRESENTATION OF CASE

A 40-year-old, ASA1 patient was posted for intradural extramedullary tumour at the level of L2-L3 spine. Patient was operated for the same and the tumour was resected. Postoperatively after 36 hours, patient complained of loss of bladder sensation associated with urinary retention. Surgical, urological and radiological findings were suggestive of mass effect (remnant tumour or clot) at the site of the previous surgery. A decision was taken to perform a re-exploration at the site with the use of electrophysiological monitoring including somatosensory and motor evoked potential. The surgery was performed completely under total intravenous sedation with the use of midazolam, fentanyl and propofol. The remnant mass was resected and the patient regained sensory functions in the post-operative period. Hence this case report highlights the use of total intravenous sedation for somatosensory and motor evoked potential monitoring in major neurosurgeries

On examination, all vitals were stable. No pallor, oedema, icterus, lymphadenopathy.

Systemic Examination
RS: Ae Be clear and equal.
CVS: S1 S2 heard, no murmur.
P/A: soft, non-tender.
CNS: Patient conscious, co-operative, oriented to time place and person.

Spine Evaluation
No deformities, no visible swelling or deformity, skin normal, no sinuses or fistula. No local rise in temperature, no tenderness

	Right	Left
Hip	5/5	5/5
Knee	5/5	5/5
Ankle	5/5	5/5
Lower Limb Power		
Sensation over left L5 S1 area decreased, while right side was normal. Loss of sensation of micturition.		

Corresponding Author:
Dr. Aparna Ruparel,
791/9, Deepmala Buliding,
3rd Road, Khar (W),
Mumbai-400052, Maharashtra, India.
E-mail: aparnaruparel@gmail.com

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Investigations
All routine investigations were within normal limits.

Pre-Anaesthetic Check-Up/Airway
Mouth opening was adequate. MPC 2, normal neck movements, no loose teeth. Patient was an easy intubation. ASA grade 1.

Plan of Anaesthesia
Patient was taken in the operating room, all monitors attached. Antibiotics were given pre-operatively to the patient. Patient was premedicated with Glycopyrrolate, Midazolam, and Fentanyl and intubated successfully using an 8 number flexo-metallic portex tube, under the effect of succinylcholine. A long acting muscle relaxant (vecuronium) was given to the patient while the patient was turned to prone position and the neuromonitoring electrodes were attached. Patient was maintained on 0.2% Isoflurane, oxygen and nitrous oxide. After the effect of the muscle relaxant wore out, inhalational anaesthetic gases were stopped and the patient was left on 100% oxygen. A baseline reading of the neuromonitoring was taken after which the incision was taken over the previous suture line and the surgery progressed. [1]

The patient was kept sedated under the effect of continuous Propofol infusion started at 35 ml/hr for 5 minutes and then reduced to 5 ml/hr. as a maintenance dose. An intermittent Infusion of Injection Nitro-glycerine was also started to keep the blood pressures under control. Pain management was done using injection Fentanyl as and when necessary. No muscle relaxant was given to the patient throughout the procedure. [2] Pultaceous material was removed from the conus medullaris. Terminal lipoma at filum terminale was clipped and cut after confirmation using electrophysiological monitoring. Once the surgery was completed, the patient was extubated successfully and shifted to the ICU. Vitals were stable.

Postoperative Care
Patient was monitored post-operatively in the ICU for one day and then shifted to the wards. Patient remained stable and regained bladder sensation post-operatively on Day 2.

Intraoperative View of Intra-dural Extramedullary Tumour

Pultaceous Material

SSEP Chartings Intraoperatively

DISCUSSION

Intra-operative neurophysiological monitoring is a technique that is helpful for assessing the nervous system during spine surgery. It includes somatosensory and transcranial motor evoked potential. Intra-operative neuro-monitoring has high utility when the risk of injury is high, but may be only marginally helpful when the risk of injury is low. Coordination of the monitoring team and the surgeon with the anaesthetist forms an essential component for the success of the procedure. The activities of the monitoring team must integrate well with those of the surgical team and the anaesthesia team, and should involve joint quality assessment and quality improvement activities. Intra-operative neuro-monitoring replaces the neurologic examination when the patient is under general anaesthesia. It allows for assessment of many neural structures including the neuro-muscular junction, peripheral nerve, brainstem, spinal cord, cortex during surgery. Hence it is the responsibility of the anaesthetist to make use of drugs that do not interfere with the procedure as well as prevent patient discomfort.

Application
1. Detecting intra-operative spinal cord injury,
2. Intra-operative monitoring for peripheral nerve injury,
3. Spinal cord tumours or space occupying lesions.

CONCLUSIONS

The use of neuro-navigation with anaesthetic techniques with fully awake patients is the best alternative in the patients with neurological tumours allowing safe margins for tumour resection and reducing subsequent neurological sequelae. Maintenance of sedation in these supra-major cases is a major challenge to the anaesthetist.

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