

# Huge brain tumor with incompatible findings between imaging analysis and neuromonitoring



Junhee Lee, M.D.<sup>1</sup>, Jieun Kim, M.D.<sup>1</sup>, Young Goo Kim, M.D.<sup>2</sup>, Soo Jeong Han, M.D., PhD.<sup>1,3</sup>

<sup>1</sup> Department of Rehabilitation Medicine and Rehabilitation, Ewha Womans University Mokdong Hospital

<sup>2</sup> Department of Neurosurgery, Ewha Womans University Mokdong Hospital

<sup>3</sup> Department of Rehabilitation Medicine and Rehabilitation, College of Medicine, Ewha Womans University

## Introduction

- We report a case of **huge brain tumor** with relatively preserved sensory and motor tract.

## Case Presentation

- A 59-year-old man complained left upper and lower extremities weakness and headache for 4 days.
- He visited outpatient clinic of department of neurosurgery and was hospitalized for brain tumor removal.
- MRI finding showed 7cm necrotic enhancing mass in the right temporal area with tumor infiltration in the right fronto-temporal and basal ganglia area with severe mass effect and subfalcine herniation to the left.
  - It was suspicious as malignant brain tumor such as glioblastoma or high-grade glioma.
- MRA finding suggested upward deviation of right middle cerebral artery by the mass and hypoplastic occlusion of right V4.
- Tractography appeared mass involvement in both sensory and motor pathways on right brain hemisphere (Figure 1).

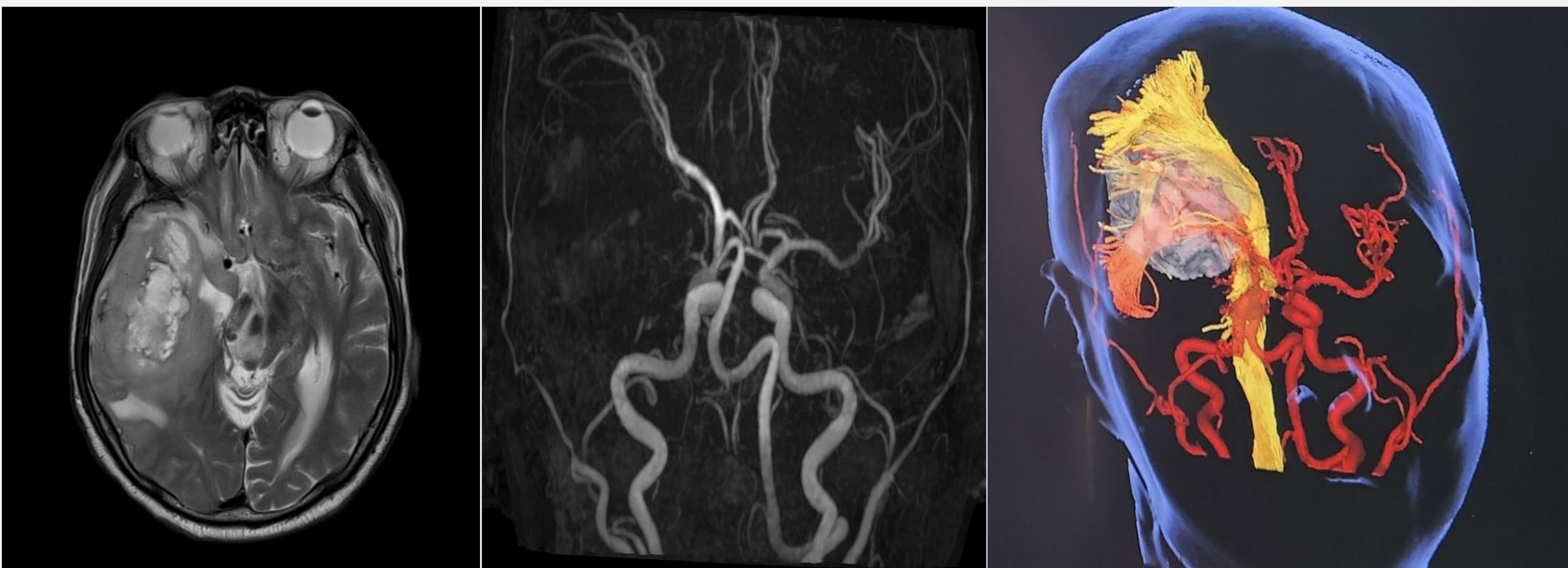


Figure 1. MRI, MRA and tractography of brain tumor

- Physical examination presented
  - Decreased light touch sensation
    - 50/100 in bilateral lower extremities
    - 60-70/100 in bilateral upper extremities
  - MMT appeared
    - grade 4 on bilateral upper extremities
    - grade 3 on bilateral lower extremities
- In pre-operative evaluations,
  - SSEPs showed relatively small amplitude in right tibial nerve stimulation and no specific abnormal finding in bilateral median nerves and left tibial nerve stimulation.
  - MEPs showed no specific abnormal findings in bilateral APB and TA muscles in cortex level.

- SSEPs, MEPs and raw EMG were monitored during the operation.
- C4 needling site was slightly moved because of considering of incision site.
- EMG monitoring showed no specific abnormal findings in bilateral BB, ADM, TA and AH muscles during the operation.
- SSEPs showed
  - Relatively small amplitude in right tibial nerve stimulation during the operation.
    - After the tumor removal, this amplitude became slightly larger compared to before.
  - Also, it showed 1 event of delayed latency and decrease amplitude in right median nerve stimulation and 1 event of abnormal waveform in bilateral median nerves stimulation during the operation.
    - These abnormal findings were recovered in normal range rapidly.
  - It showed normal responses in left tibial nerve stimulation during the operation.
- MEPs showed normal responses in bilateral BB, ADM, TA and AH muscles by stimulating motor cortex before and after tumor removal (Figure 2).

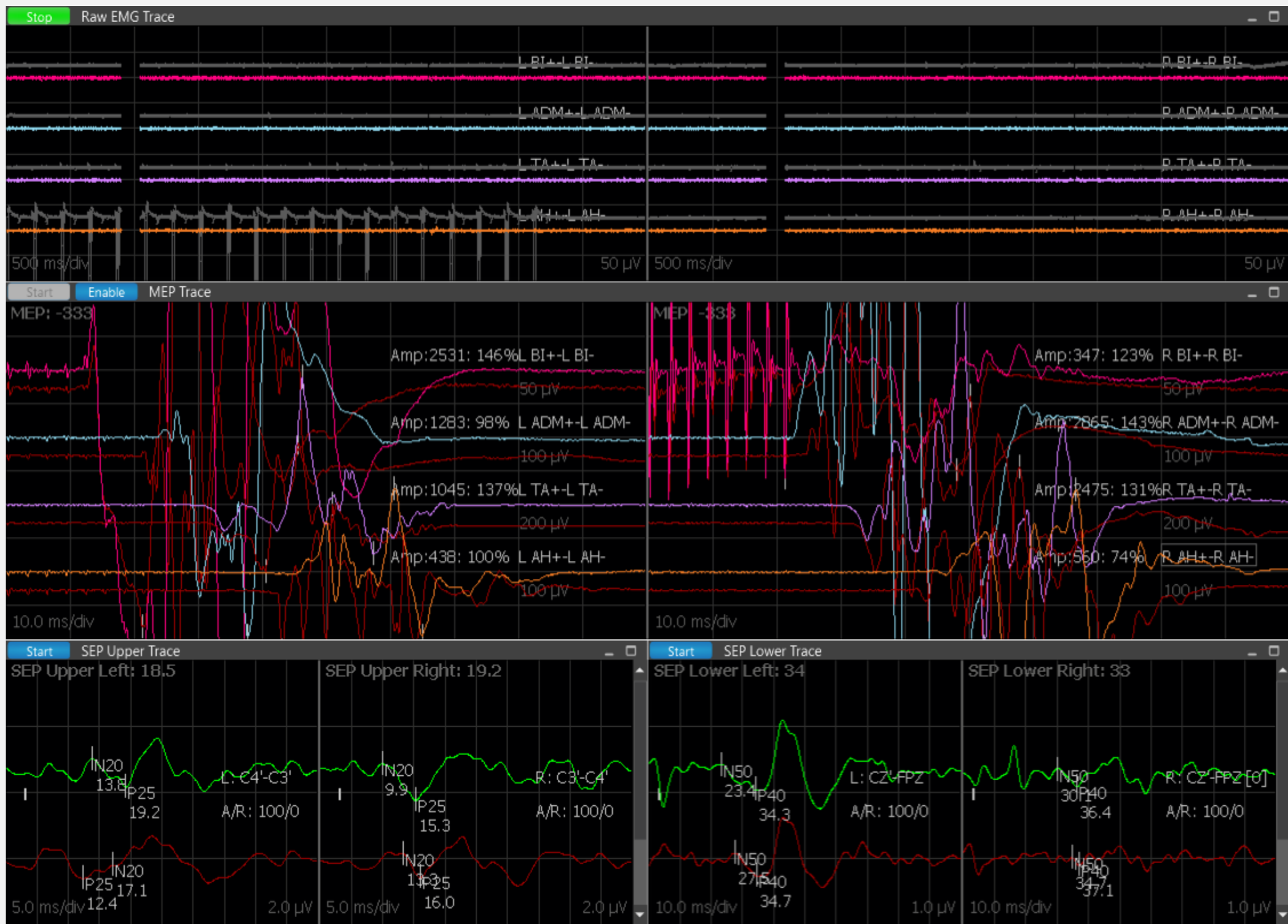


Figure 2. IONM findings during the operation

- One weeks after tumor removal,
  - MMT showed improvement on 4 extremities, grade 4 to 5 on bilateral upper extremities and grade 3 to 4-5 on bilateral lower extremities
  - Decreased light touch sensation also recovered generally

## Discussion

- It was suspected that sensory and motor pathway may be deteriorated, however, in pre-operative EPs and IONM findings suggested relatively preserved pathways even though serious mass infiltration in neural structures shown in image findings.
- In this case, we could take notice that the incompatible findings between two evaluation tools may imply the importance of EP evaluations and IONM even in patients with huge brain tumor who anticipated to have severe defect on sensory and motor tract.