# Previously Embolized Arteriovenous Malformation (AVM)

# 12

- **Demographics:** Male; 32 years
- **Initial Presentation:** Seizures for 2 months before radiosurgery treatment
- **Diagnosis:** Parieto-occipital AVM
- **Pre-radiosurgery Treatment:** Endovascular embolization; 3 weeks before radiosurgery treatment
- **Pre-radiosurgery Presentation:** Seizures (generalized tonic-clonic)
- **Radiosurgery Treatment:**
  Adjunctive; Linac-based SRS for post-embolization residual, left, parieto-occipital AVM
- **Radiosurgery Dosimetry:**
  - Target volume: 2.8 cc
  - Marginal dose: 20.0 Gy
  - Marginal isodose: 80%
  - Maximum dose: 25.0 Gy
  - Minimum dose: 18.1 Gy
  - Average dose: 23.9 Gy
  - Number of isocenters: 1
- **Follow-Up Period:** 82 months post-SRS
- **Clinical Outcome:**
  - 6 months post-SRS: Persistent seizures with medication
  - 18 months post-SRS: Decreased seizures frequency with medication
  - 30 months post-SRS: Controlled seizures with medication
  - 48 months post-SRS: Controlled seizures with lower dose of medication
  - 82 months post-SRS: Sustainable control of seizures with lower dose of medication
- **Complications:** None
- **Radiological Outcome:**
  - 6 months post-SRS (MRI): Stationary size of AVM nidus
  - 12 months post-SRS (MRI):
    Decrease in size of AVM nidus
    Appearance of perinidal high signal in T2 and FLAIR studies, denoting vasogenic edema
    Appearance of perinidal enhancing lesion, in T1 Gadolinium-enhanced study, denoting radiation-induced parenchymal changes
  - 18 months post-SRS (MRI):
    More decrease in size of AVM nidus
    Increased perinidal high signal in T2 and FLAIR studies
    Increase in size of perinidal enhancing lesion, in T1 Gadolinium-enhanced study
  - 24 months post-SRS (MRI):
    More decrease in size of AVM nidus
    Resolving perinidal high signal in T2 and FLAIR studies
    Decrease in size of perinidal enhancing lesion, in T1 Gadolinium-enhanced study
  - 36 months post-SRS (MRI):
    Stationary decreased size of AVM nidus
    Mild residual perinidal high signal in T2 and FLAIR studies
    Resolution of perinidal enhancement, in T1 Gadolinium-enhanced study
  - 36 months post-SRS (CTA): Residual small AVM nidus
  - 48 months post-SRS (CTA): Residual smaller AVM nidus
  - 82 months post-SRS (CTA): Residual much smaller AVM nidus
- **Post-radiosurgery Treatment:** Continued anti-convulsant medication. The patient is scheduled for conventional cerebral angiography and will be offered surgery, repeat radiosurgery, or endovascular embolization for the post-radiosurgery residual, non-obliterated, small AVM nidus

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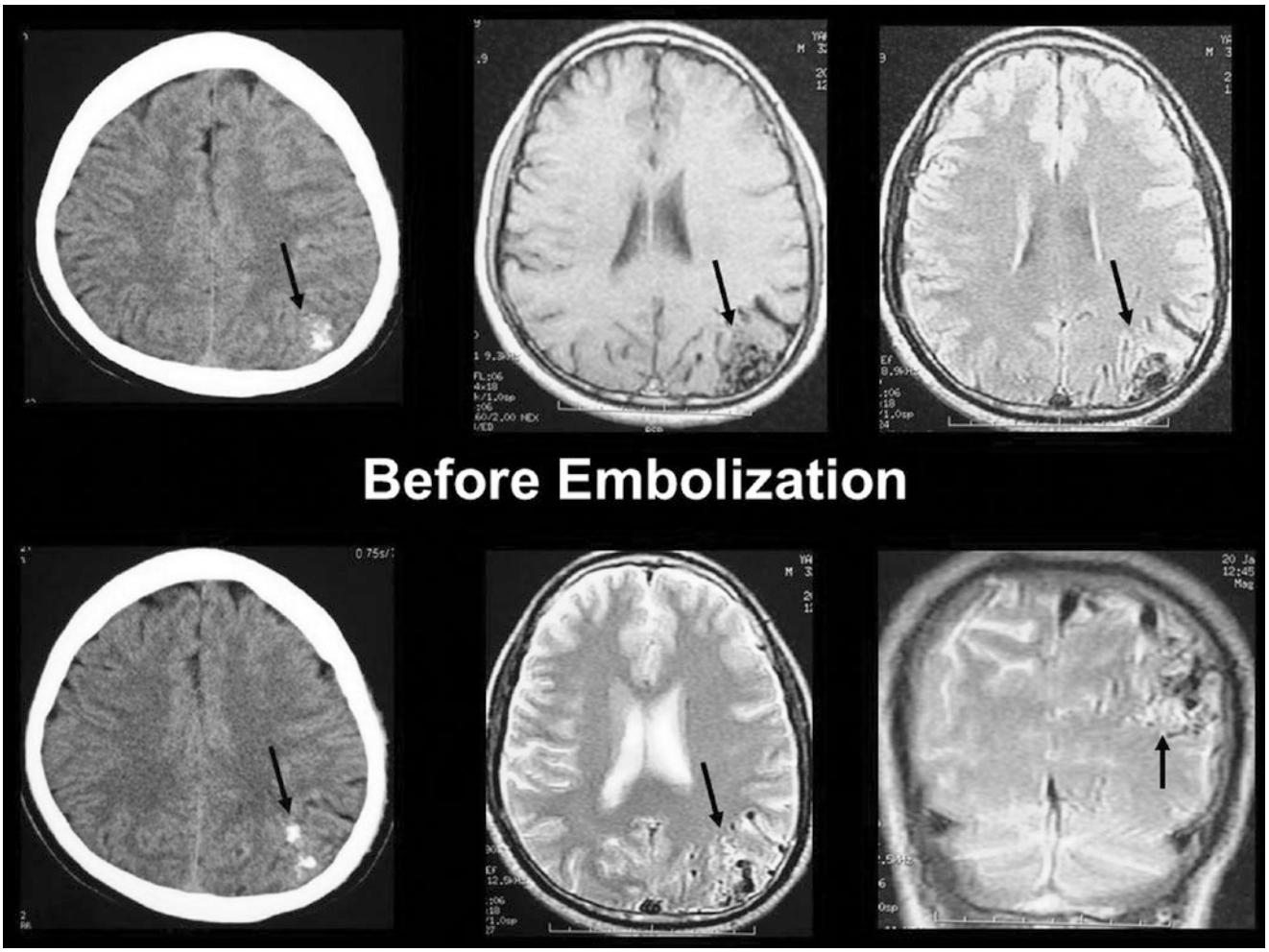
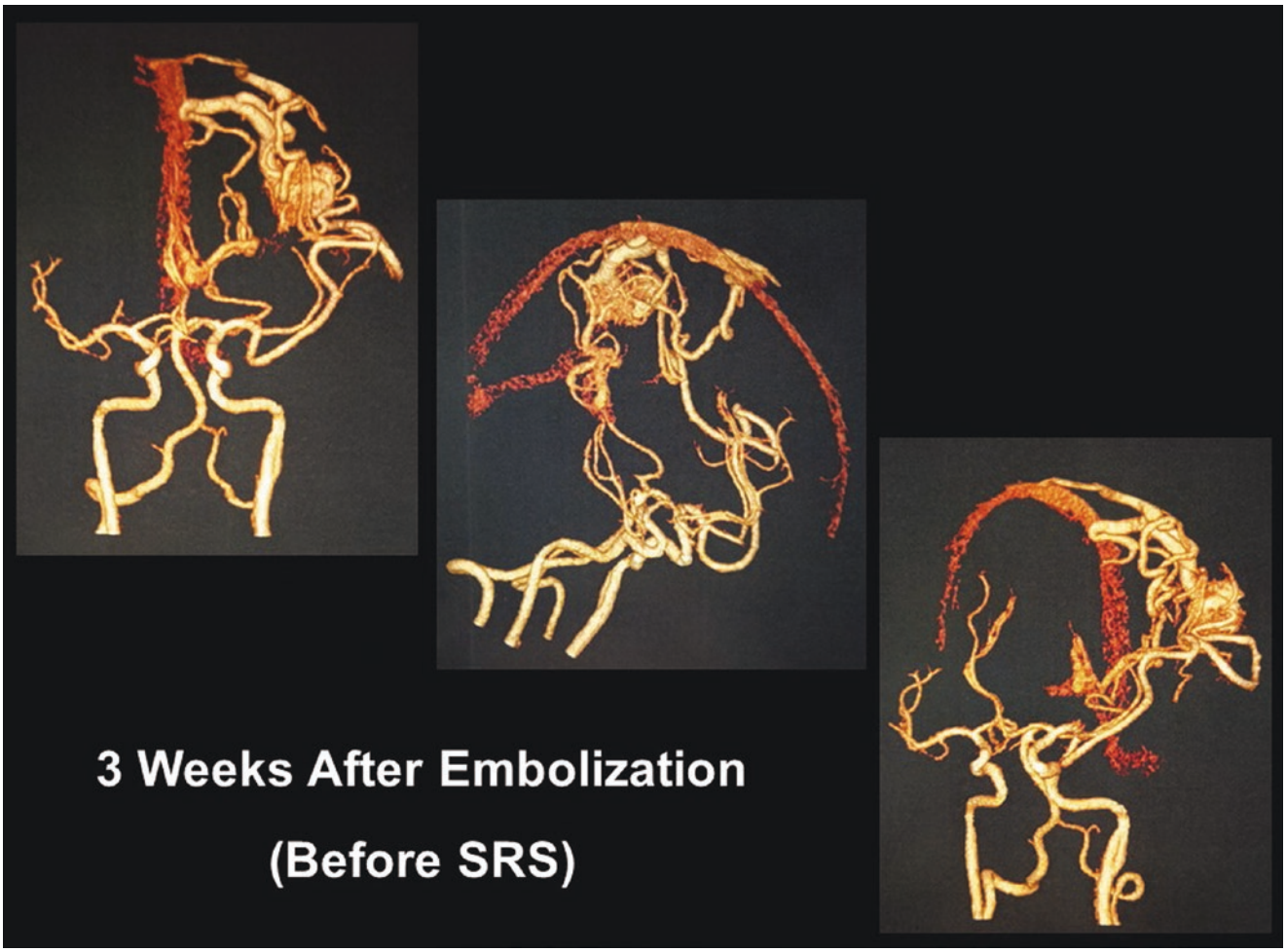
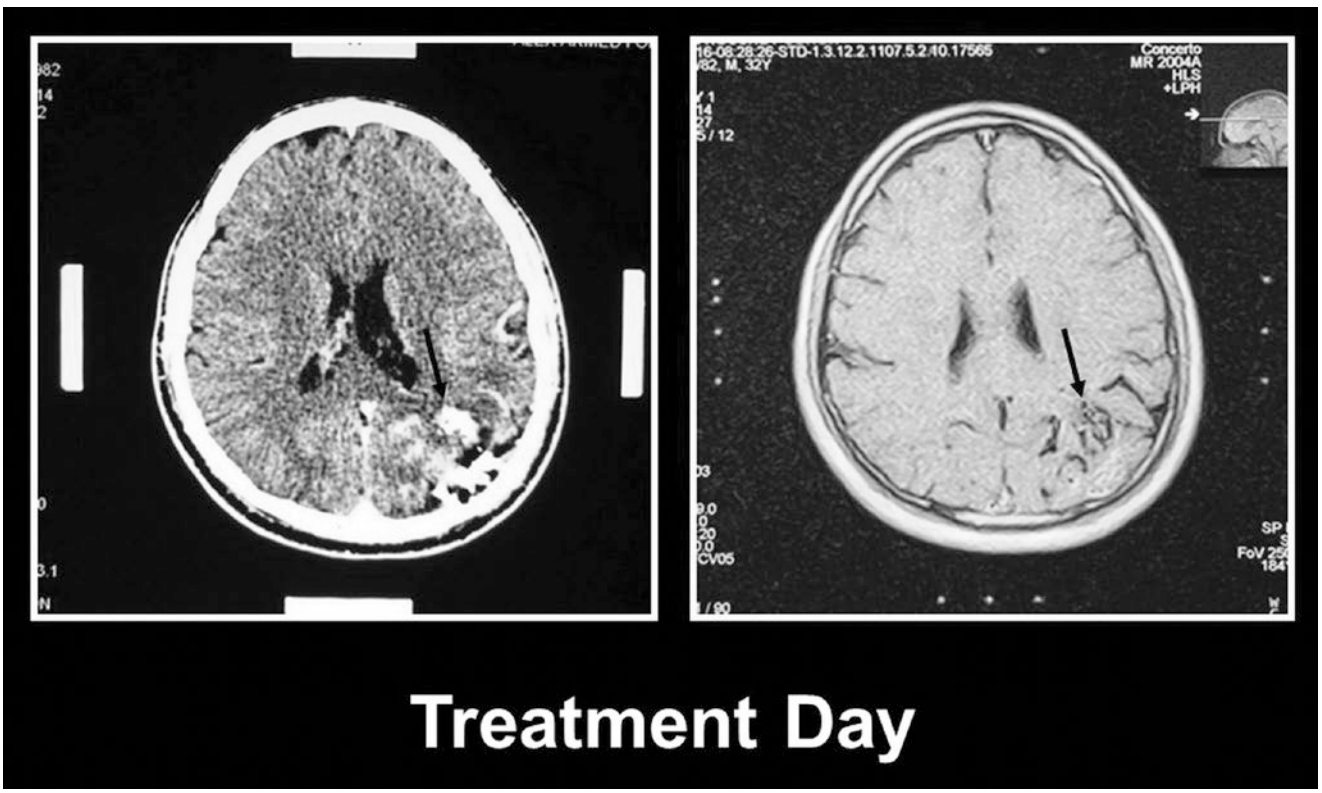
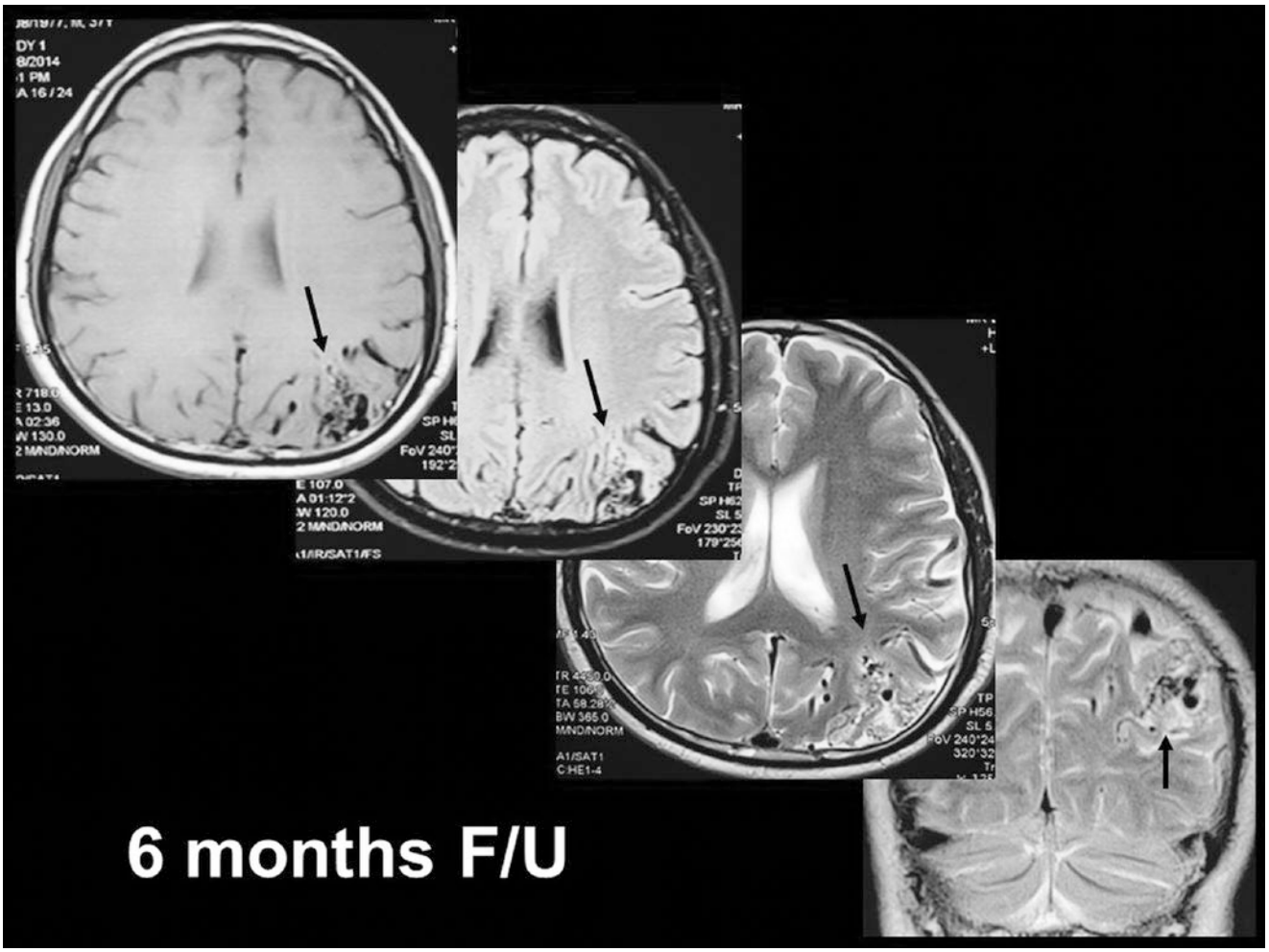
O. S. Abdelaziz, A. A. F. De Salles, *NeuroRadiosurgery: Case Review Atlas*, https://doi.org/10.1007/978-3-031-16199-5_12

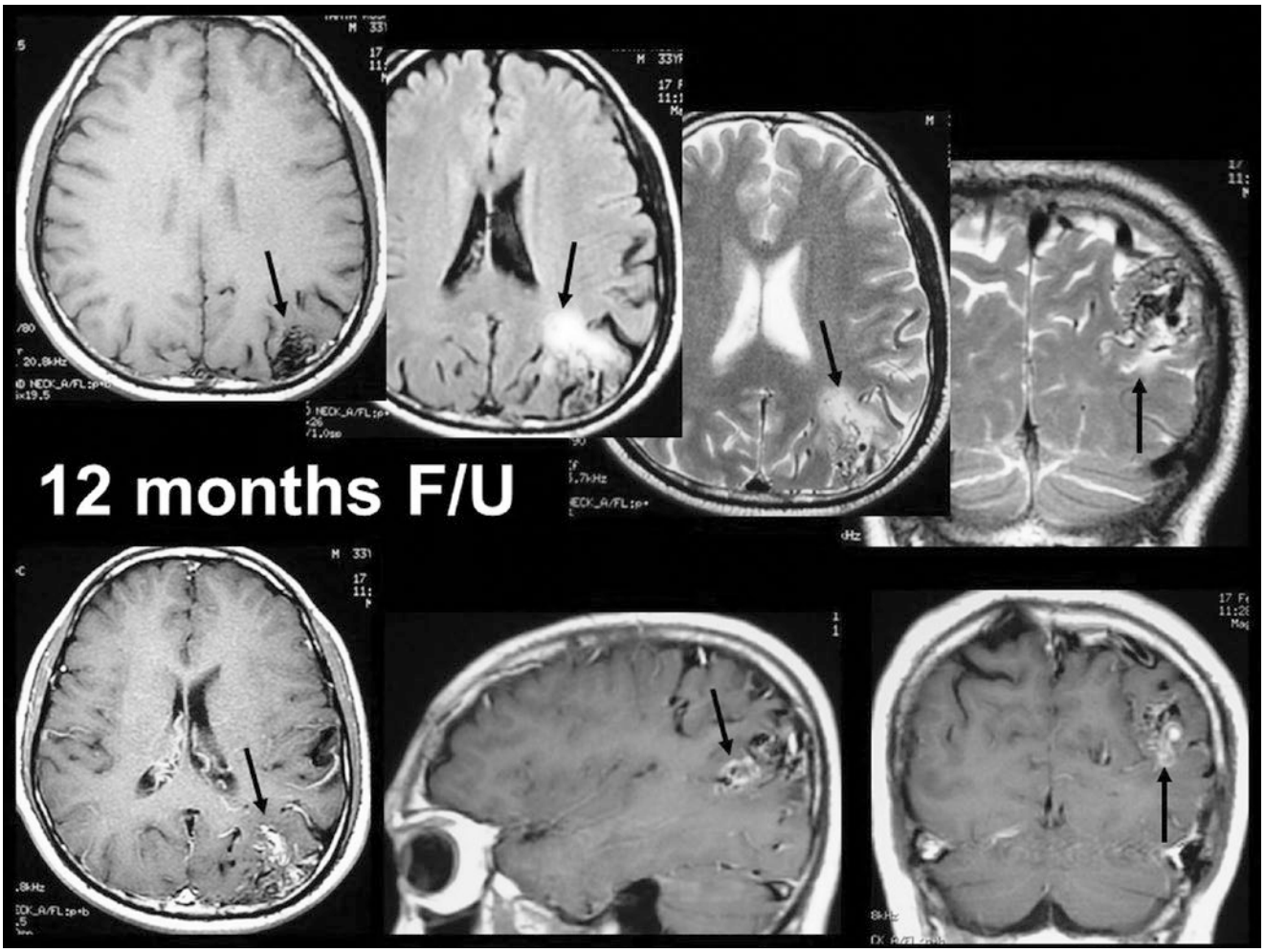

Before Embolization

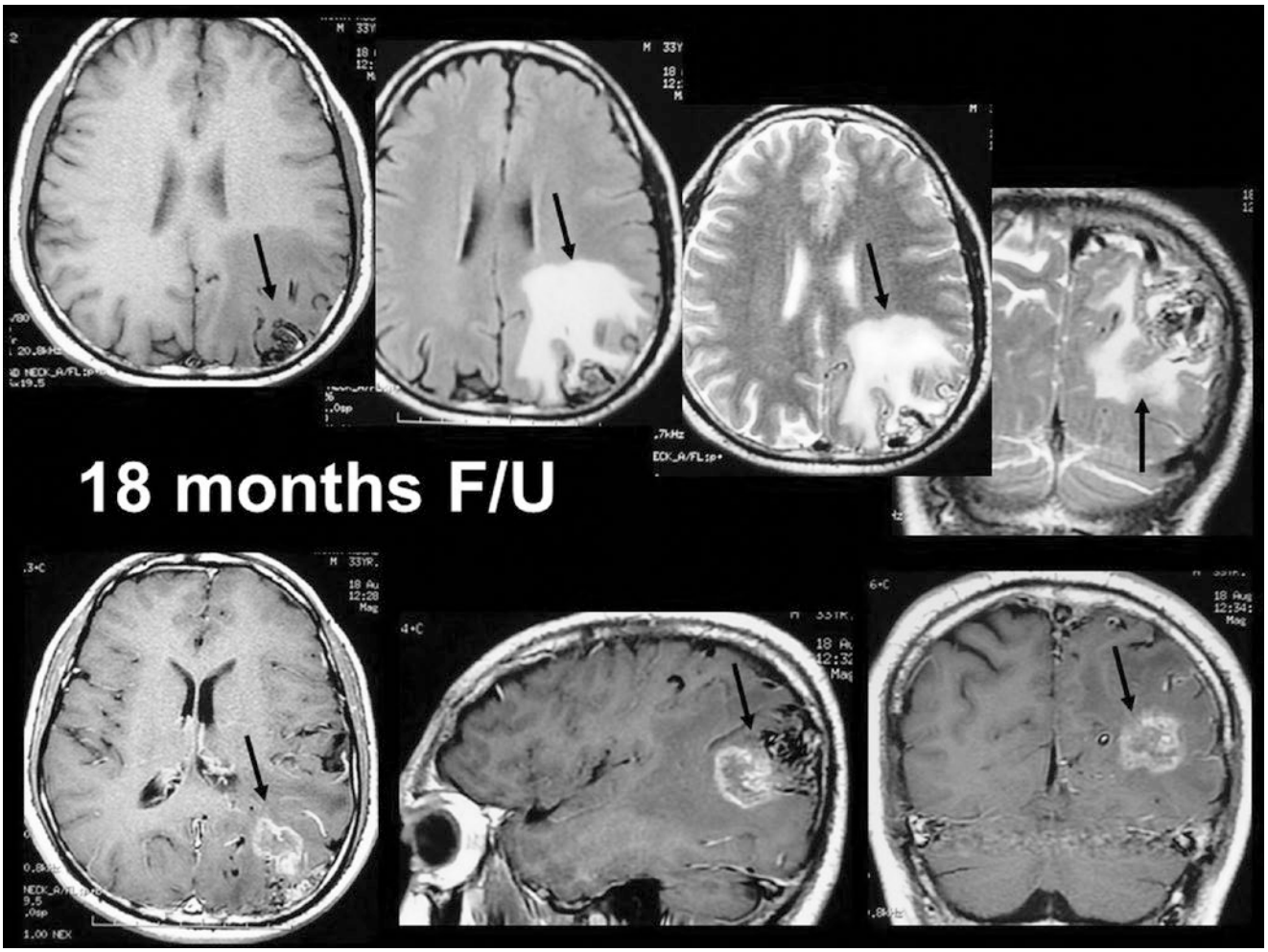

Before Embolization

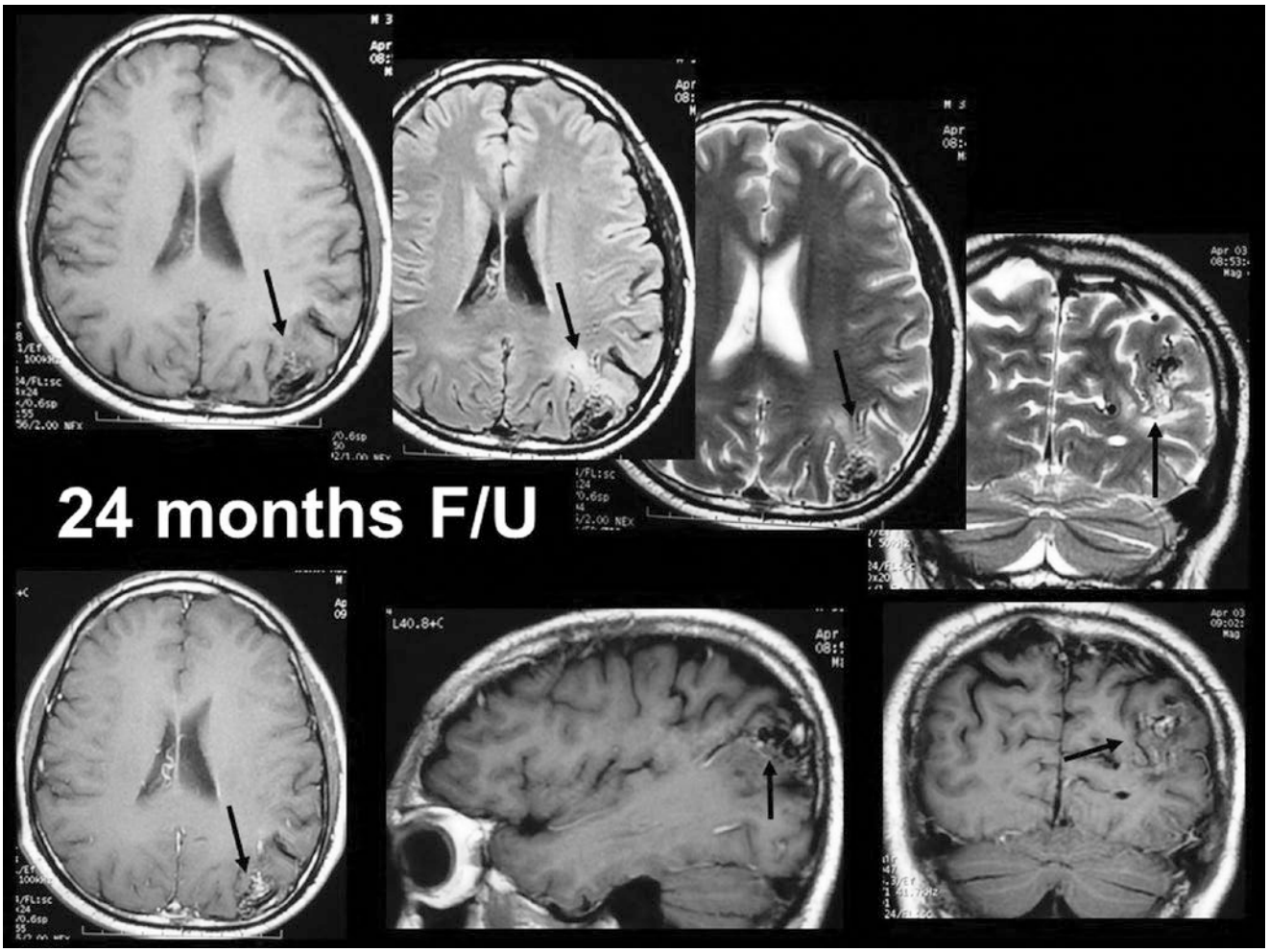

3 Weeks After Embolization
(Before SRS)

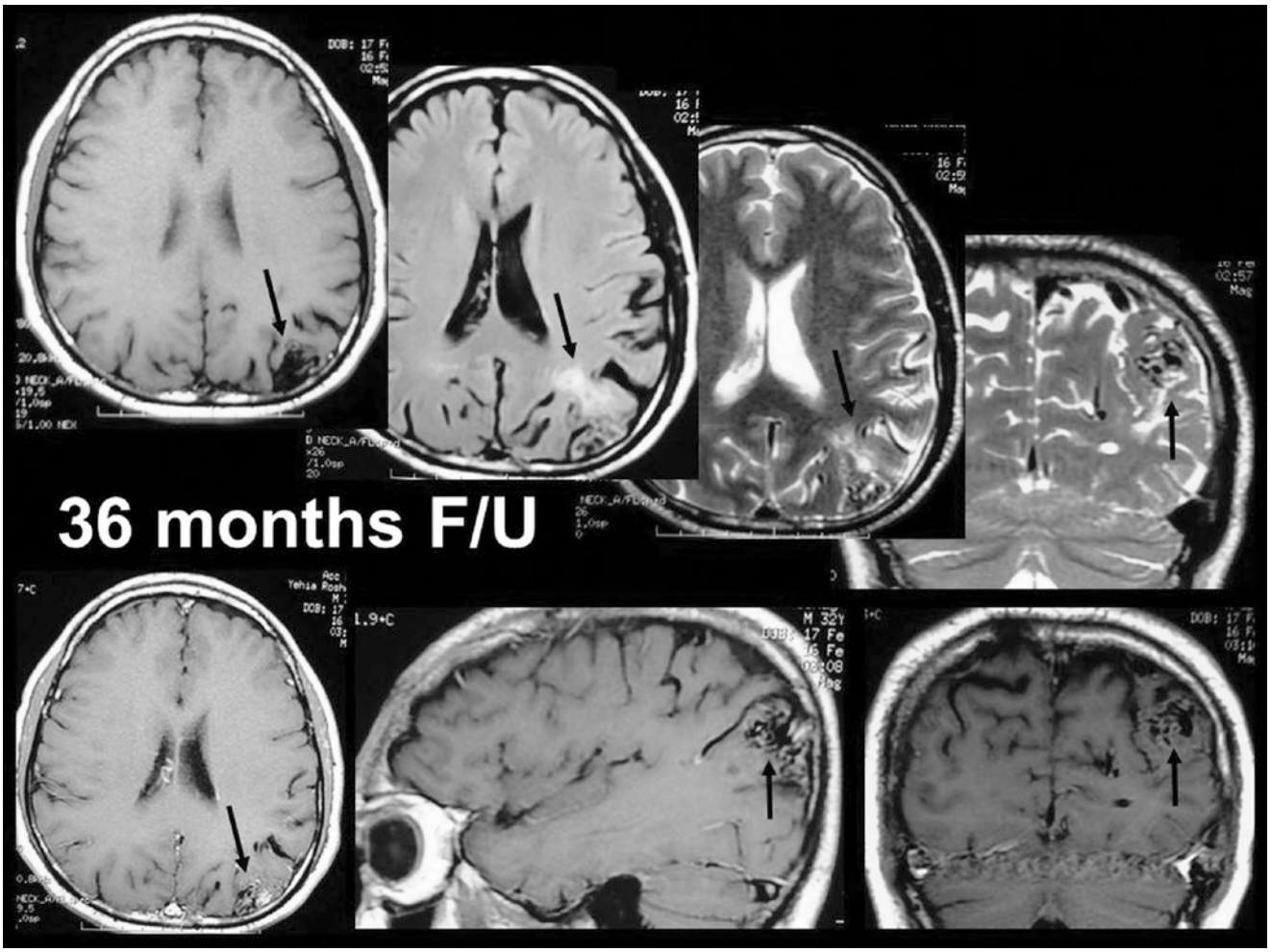

Concerto
MR 2004A
HLS
+LPH
Treatment Day

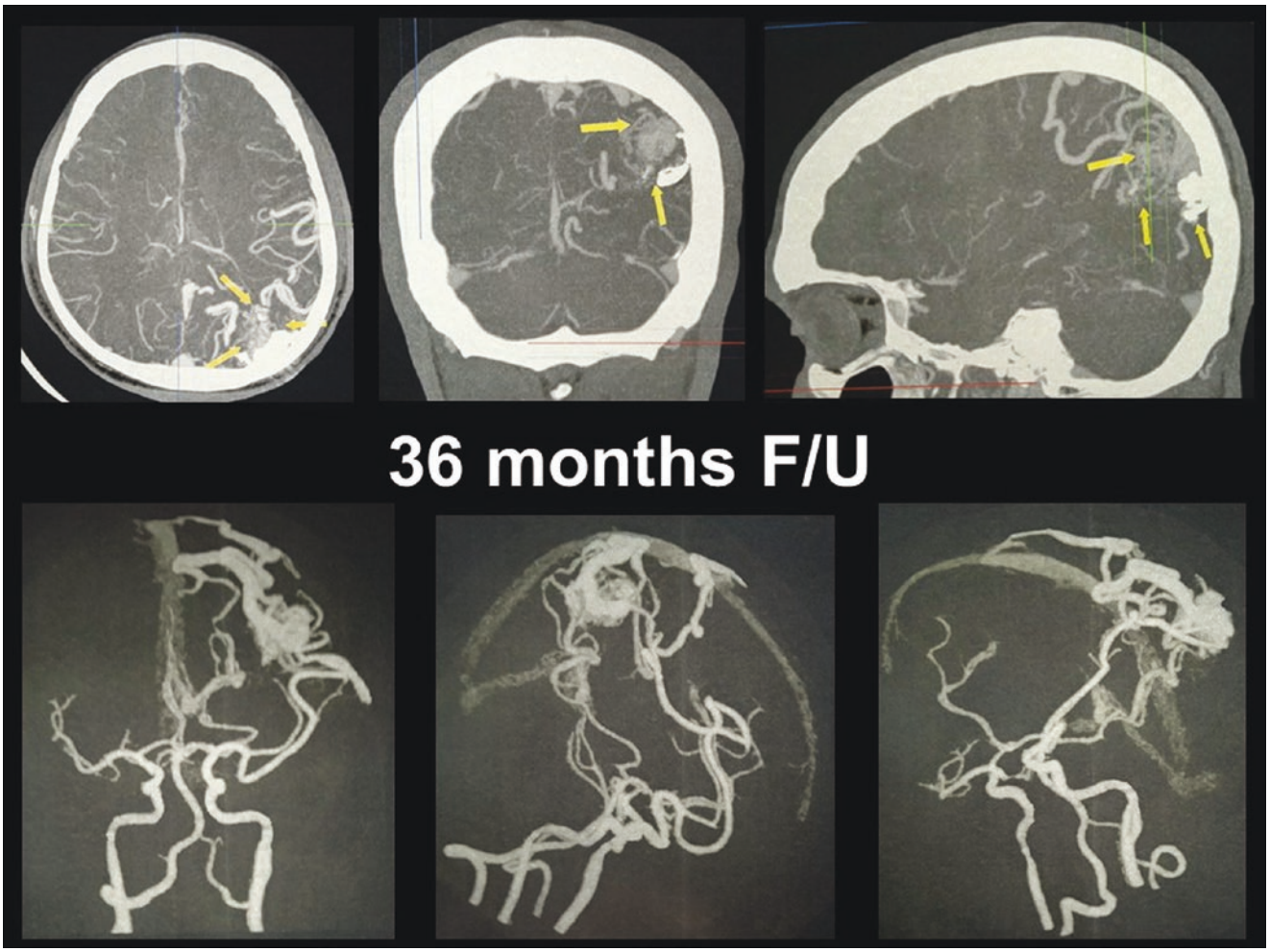

6 months F/U

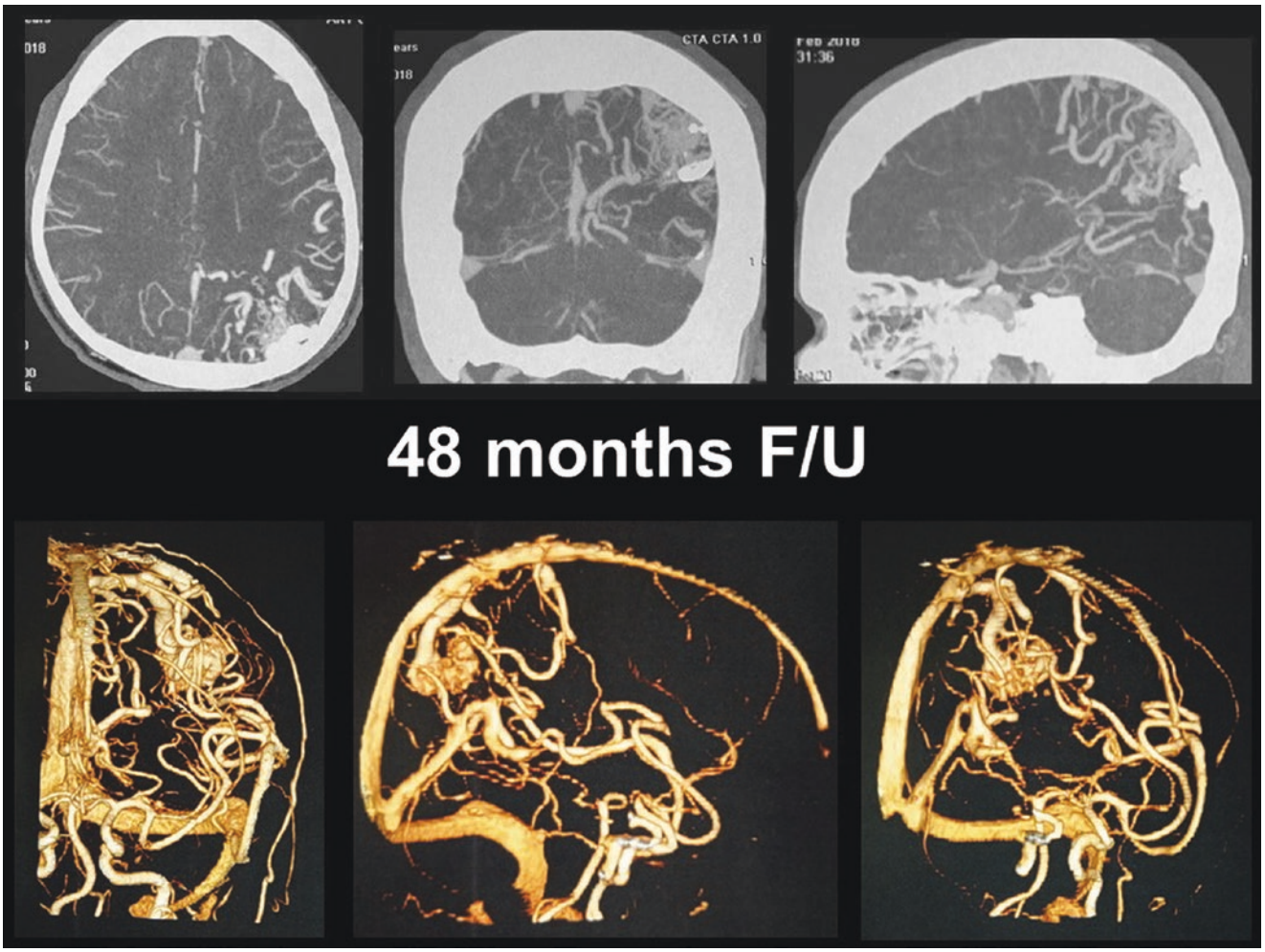

12 months F/U

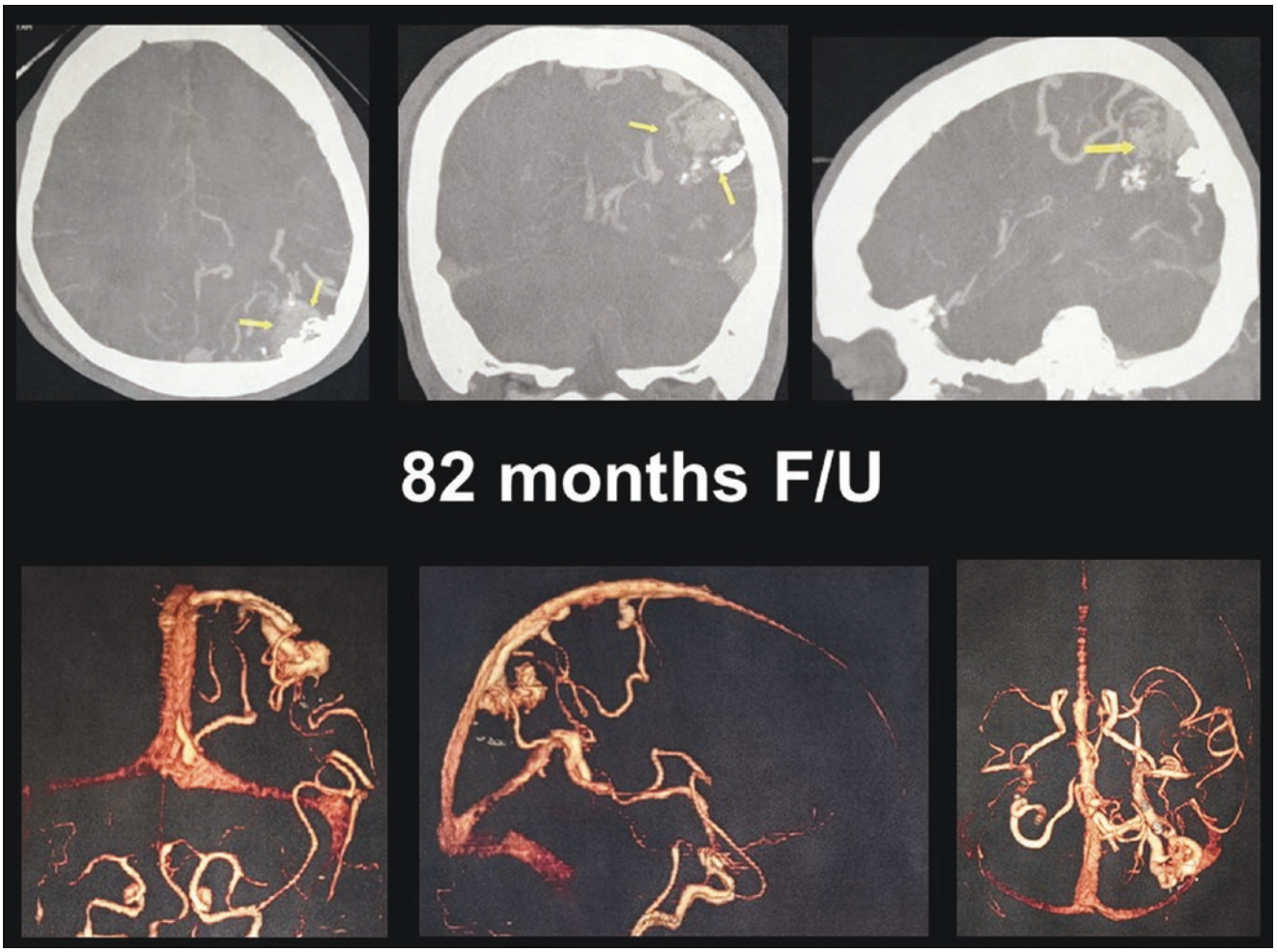

18 months F/U


24 months F/U

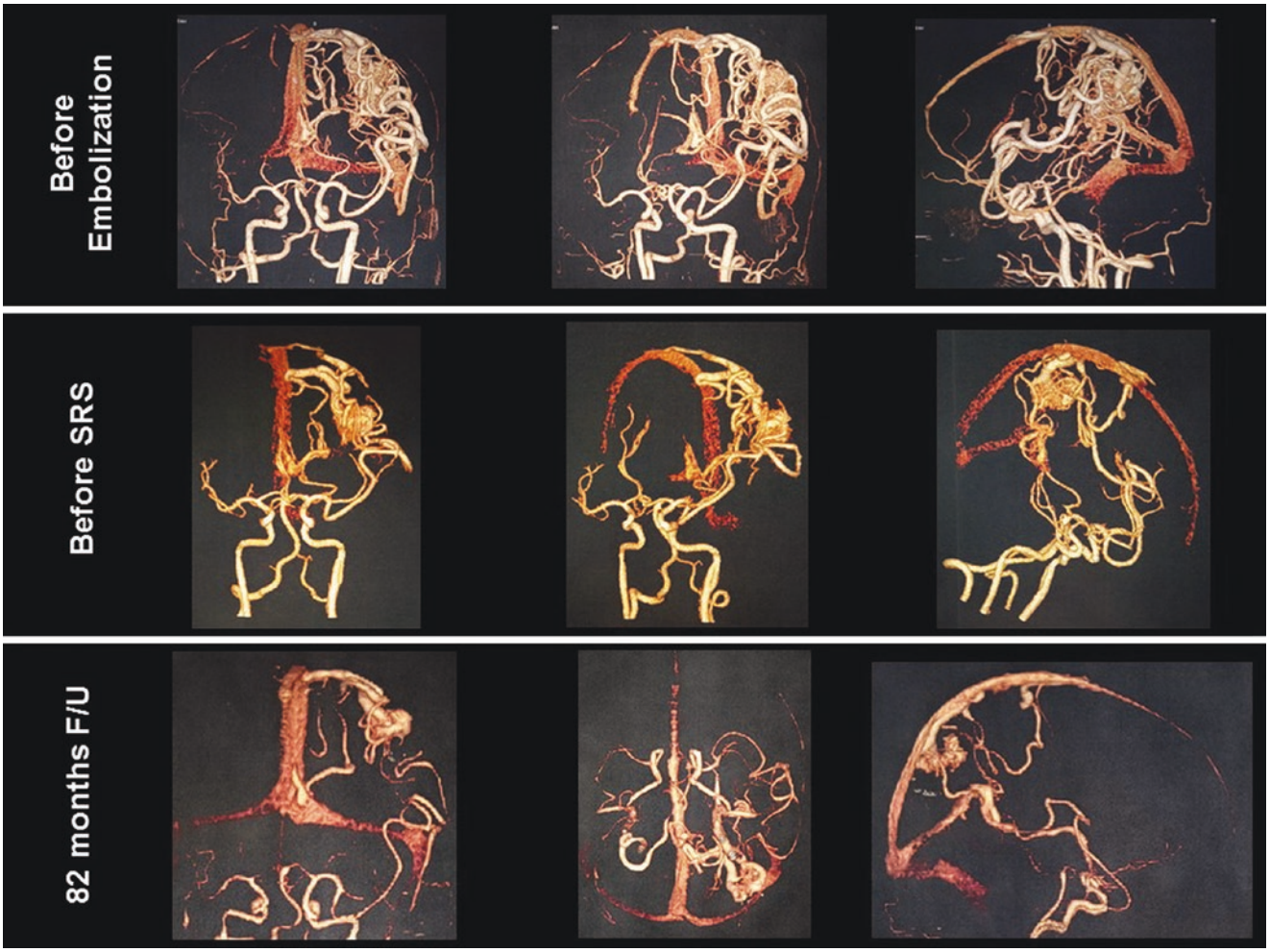

36 months F/U


36 months F/U


48 months F/U


82 months F/U


Before SRS
36 months F/U
48 months F/U




## Further Reading

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Lee CC, Chen CJ, Ball B, et al. Stereotactic radiosurgery for arteriovenous malformations after Onyx embolization: a case-control study. J Neurosurg. 2015;123(1):120–35.

Schäuble B, Cascino GD, Pollock BE, et al. Seizure outcomes after stereotactic radiosurgery for cerebral arteriovenous malformations. Neurology. 2004;63(4):683–7.

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