

AMSER Case of the Month

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92-year-old male presenting with acute neurologic decline 12 hours after mechanical thrombectomy

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Patient Presentation

- 92-year-old male with history of dementia, atrial fibrillation (on apixaban), hypothyroidism, and coronary artery disease who presented with left facial droop, dysarthria, and confusion.
- The patient was found to have a right distal M1 occlusion treated with mechanical thrombectomy
- Approximately 12 hours post-procedure, he developed decreased arousability, right gaze deviation, and seizure activity
- Vitals: hemodynamically stable pre- and post-thrombectomy
- Physical Exam: acute neurologic decline with decreased responsiveness and gaze deviation

Pertinent Labs

Normal renal function: Cr 0.73 (eGFR 85).

No other pertinent labs.

What Imaging Should We Order?

Select the applicable ACR Appropriateness Criteria

This imaging modality was ordered by the primary team:

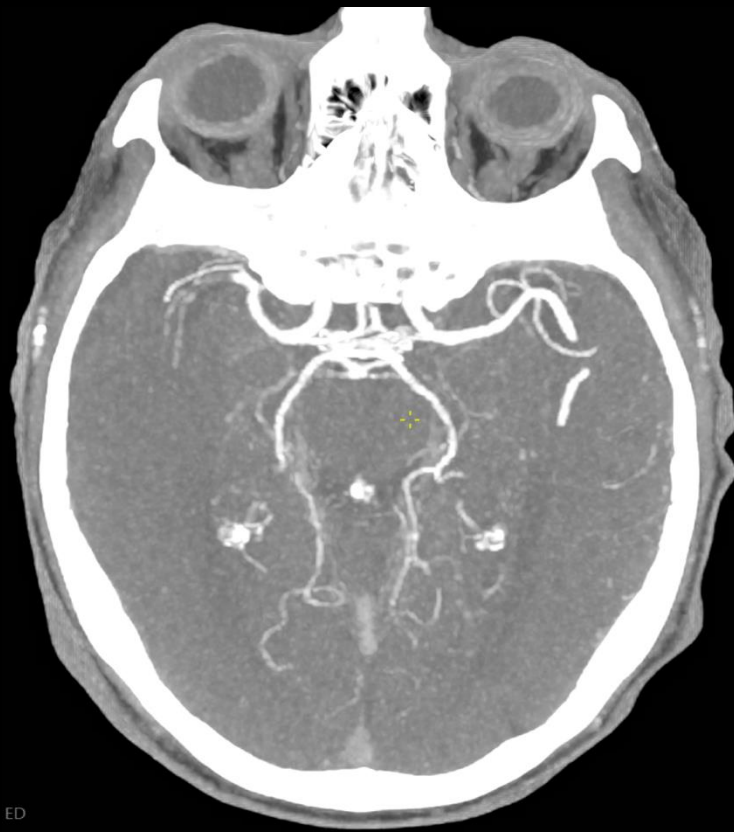
Cerebrovascular Diseases-Stroke and Stroke-Related Conditions

Variant: 4 Adult. Recent ischemic infarct; greater than 24 hours. Initial imaging.

Procedure	Appropriateness Category	Relative Radiation Level
MRI head without IV contrast	Usually Appropriate	0
CT head without IV contrast	Usually Appropriate	0000
CTA head with IV contrast	Usually Appropriate	0000
CTA neck with IV contrast	Usually Appropriate	0000
US duplex Doppler carotid artery	May Be Appropriate	0
MRA head without IV contrast	May Be Appropriate	0
MRA neck without and with IV contrast	May Be Appropriate	0
MRA neck without IV contrast	May Be Appropriate	0
US duplex Doppler transcranial	Usually Not Appropriate	0
Arteriography cervicocerebral	Usually Not Appropriate	0000
MRA head without and with IV contrast	Usually Not Appropriate	0
MRI head perfusion with IV contrast	Usually Not Appropriate	0
MRI head without and with IV contrast	Usually Not Appropriate	0
MRV head without and with IV contrast	Usually Not Appropriate	0
MRV head without IV contrast	Usually Not Appropriate	0
CT head perfusion with IV contrast	Usually Not Appropriate	0000
CT head with IV contrast	Usually Not Appropriate	0000
CT head without and with IV contrast	Usually Not Appropriate	0000
CTV head with IV contrast	Usually Not Appropriate	0000

Findings (unlabeled)

CTA of the head

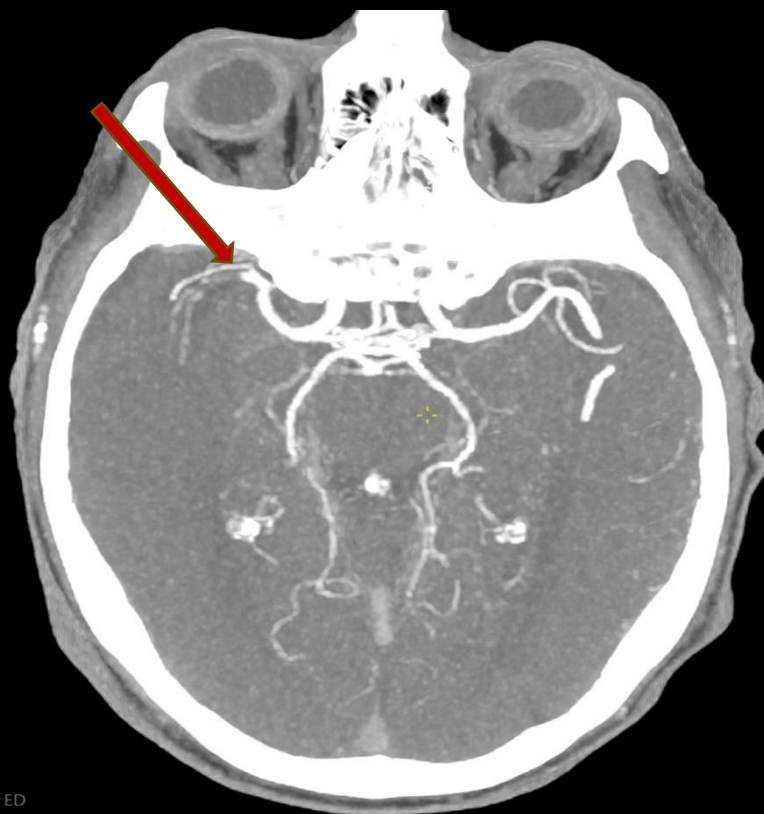


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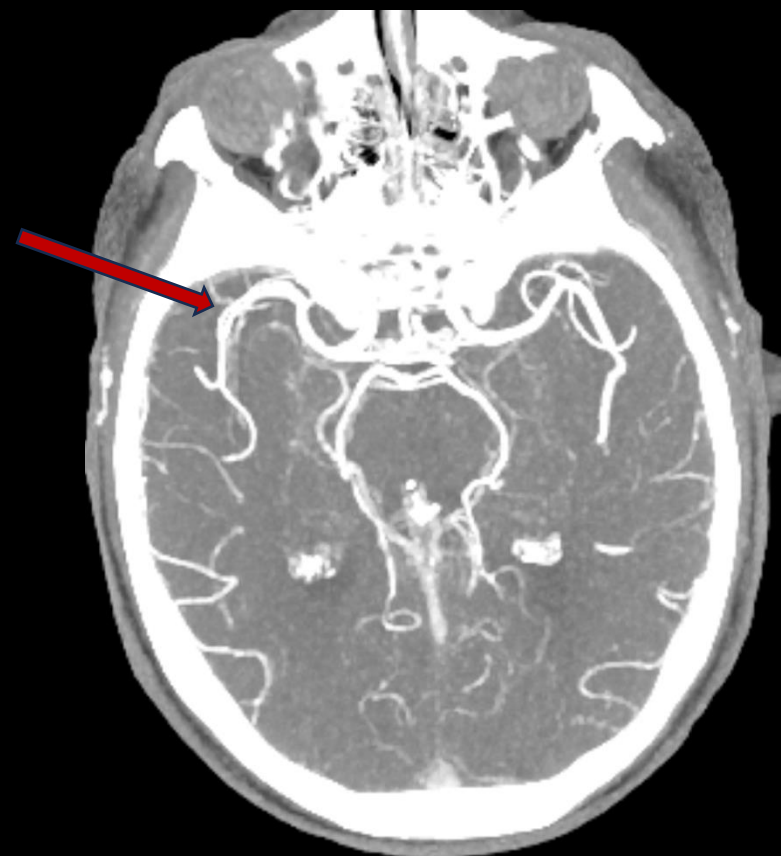


Findings: (labeled)

CTA of the head



Right distal M1 occlusion with
reduced distal MCA flow



Reperfusion post-thrombectomy

Findings (unlabeled)



Pre-thrombectomy CT



Immediate Post-thrombectomy CT

Findings (unlabeled)



Subsequent post-thrombectomy CT

Findings: (labeled)

Pre-thrombectomy CT



Arrow: Normal appearance of the frontal lobe

Immediate Post-thrombectomy CT



Arrow: Prominent cortical and subarachnoid hyperdensity in the frontal region

Findings: (labeled)

Subsequent post-thrombectomy CT



Arrow: cortical and subarachnoid
isodensity in the frontal region

Final Dx:

Contrast-Induced Neurotoxicity Following
Mechanical Thrombectomy for MCA Stroke

Case Discussion (1-3 slides)

Etiology:

- Contrast-induced neurotoxicity (CIN), also termed contrast-induced encephalopathy (CIE), is an uncommon but increasingly recognized adverse event after mechanical thrombectomy, with an estimated incidence of 1.7–4.7%.¹
- It typically presents within 24 hours after the procedure as new or worsening neurological deficits that cannot be explained by infarct progression or hemorrhagic transformation.
- Characteristic imaging findings include cerebral edema and contrast staining extending beyond the infarct core.^{2,3}

Case Discussion (1-3 slides)

Clinical Presentation:

- CIE typically presents with a gradual, progressive onset of symptoms within hours after the procedure (median ~4 hours).²
- Common clinical features include worsening focal neurological deficits, encephalopathy, coma, and seizures.¹
- Symptoms often begin with encephalopathy and may progress to more localized neurological findings.^{2,3}

Case Discussion (1-3 slides)

Risk Factors:

- Renal dysfunction (eGFR <45); associated with contrast-related kidney injury¹. Prior stroke history².
- Procedural factors: increased device passes and contrast volume
Blood pressure variability during procedure³.
- Hypertension and hyperglycemia at presentation^{3,4}.
- Recent thrombectomy series reported an incidence of approximately 4.7%, with higher contrast exposure and increased device passes identified as associated risk factors.⁵

Case Discussion (1-3 slides)

Prognosis and Management:

- CIE is typically reversible, with complete symptom resolution occurring within approximately 3 days (range ~2.5–3 days).
- However, affected patients may have worse functional outcomes compared to those without CIE.²
- When recognized early, CIE may not significantly impact mortality or discharge functional status (mRS).
- Management is primarily supportive and includes promoting contrast clearance, controlling intracranial pressure, and addressing inflammation or vasospasm.³

Case Discussion (1-3 slides)

Imaging Findings (Pre-thrombectomy):

- Pre-thrombectomy non-contrast CT head demonstrates no acute intracranial hemorrhage, preserved gray-white differentiation, and no significant mass effect or midline shift.
- Pre-thrombectomy CTA head/neck demonstrates occlusion of the distal M1 segment of the right middle cerebral artery with diminished distal flow, particularly within the posterior MCA branches. No significant cervical carotid or vertebral artery stenosis/occlusion is identified, and the remaining major intracranial vessels are patent.

Case Discussion (1-3 slides)

Imaging Findings (Post-thrombectomy):

- Post-thrombectomy CTA head/neck demonstrates interval recanalization of the previously occluded distal right M1 segment with reconstitution of distal flow in the right M2 branches and mild-to-moderate residual stenosis at the prior occlusion site.
- Initial post-thrombectomy non-contrast CT head demonstrates prominent cortical and subarachnoid sulcal hyperdensity in the frontal regions.
- Subsequent non-contrast CT head demonstrates progressive decrease in the cortical and subarachnoid sulcal density.
- Despite supportive management, the patient experienced progressive neurological deterioration and died after transition to comfort-focused care.

References:

1. Chu YT, Lee KP, Chen CH, et al. Contrast-Induced Encephalopathy After Endovascular Thrombectomy for Acute Ischemic Stroke. *Stroke*. Dec 2020;51(12):3756-3759. doi:10.1161/strokeaha.120.031518
2. Zevallos CB, Dandapat S, Ansari S, et al. Clinical and Imaging Features of Contrast-Induced Neurotoxicity After Neurointerventional Surgery. *World Neurosurg*. Oct 2020;142:e316-e324. doi:10.1016/j.wneu.2020.06.218
3. Li M, Liu J, Chen F, Fan C, Yang X, Sun X. Contrast-induced encephalopathy following endovascular treatment for intracranial aneurysms-risk factors analysis and clinical strategy. *Neuroradiology*. Mar 2023;65(3):629-635. doi:10.1007/s00234-022-03077-7
4. Hoche C, Henderson A, Ifergan H, et al. Determinants and Clinical Relevance of Iodine Contrast Extravasation after Endovascular Thrombectomy: A Dual-Energy CT Study. *AJNR Am J Neuroradiol*. Dec 29 2023;45(1):30-36. doi:10.3174/ajnr.A8081
5. Zidan M, Ghaei S, Bode F, Radbruch A, Dorn F. Early detection of contrast-induced encephalopathy after mechanical thrombectomy using flat-detector CT: incidence, risk factors, and clinical implications. *Neuroradiology*. May 2025;67(5):1153-1162. doi:10.1007/s00234-025-03630-0