A Case Report of the Use of CT Dual Energy Images to Definitively Identify Intracranial Silicone Oil Migration Mimicking Intracerebral Hemorrhage

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Clinical Presentation

85 year old female with PMH of coronary artery disease with stent on blood thinners, hypertension and prior retinal detachment treated with post-intraorbital oil placement presented to the ED with a chief concern of **ground-level fall and suspected brain bleed**. The patient reported tripping over a curb and landing on her left hand and wrist. She presented to an outside hospital to get x-rays of her left hand and wrist. CT scan of her head was also taken where she was found to have an **intraventricular hyperdense area suspicious of hemorrhage** prompting transfer to Vanderbilt.

Imaging:
Conventional
Axial Non-Contrast CT

Hyperdense material along the frontal horns of the bilateral lateral ventricles largely unchanged from imaging approximately 12 hours prior **suspicious for intracranial hemorrhage**



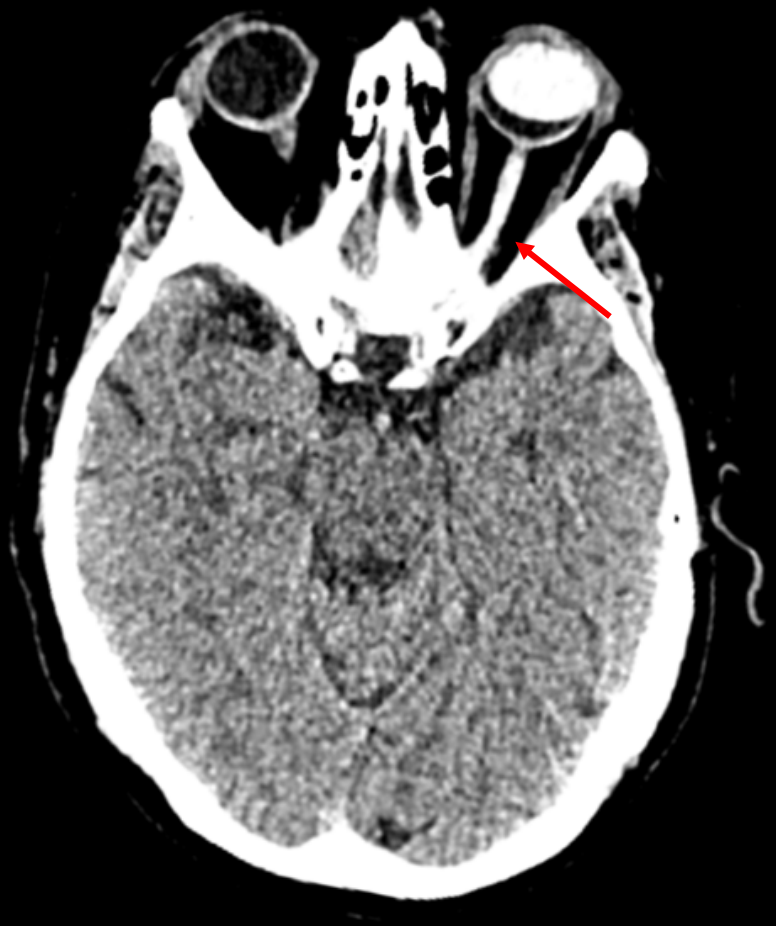
Imaging:
Conventional Axial Non-Contrast CT

Additional 9 mm hyperdense structure is seen along the basilar cisterns, along the expected location of the left terminus ICA.



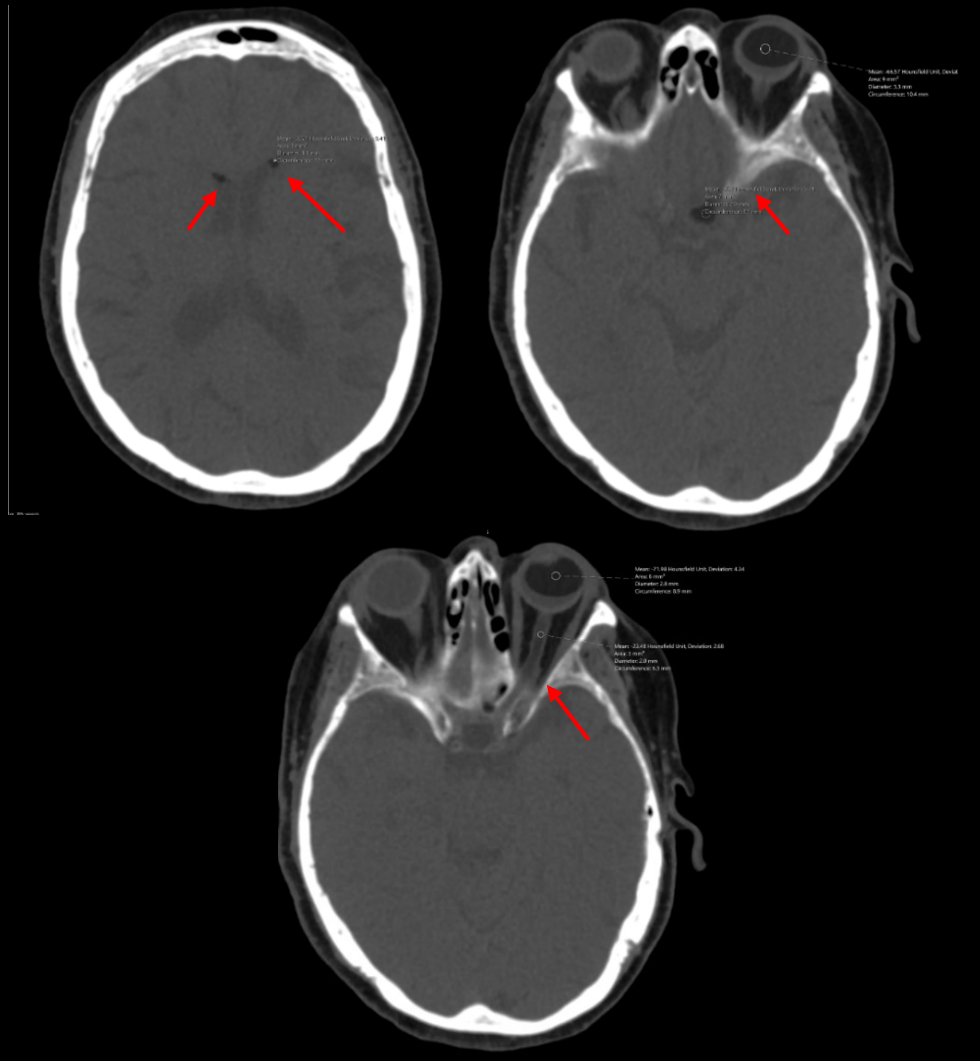
Imaging:
Conventional Axial Non-Contrast CT

Hyperdense material is also seen within the left orbit and along the left optic nerve **in line with a history of silicone oil injection for retinal detachment.**



Imaging:
Dual Energy CT Virtual Non-Contrast

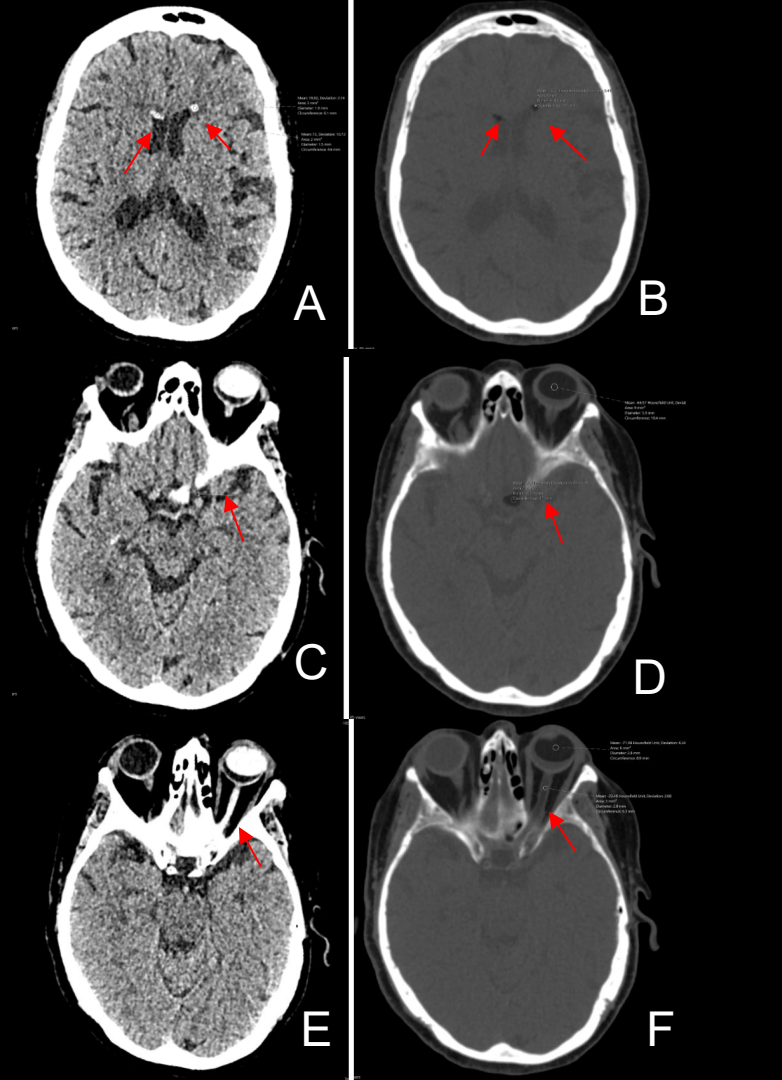
The high attenuation foci seen on traditional non-contrast CT images showed **low attenuation on CT Dual Energy Virtual non-contrast images.**



Imaging:
Conventional Non-Contrast CT vs. Dual Energy CT Virtual Non-Contrast

The areas of hyperdensity on conventional non-contrast CT of the head (A, C, E) demonstrates hypodensity on the dual energy virtual non-contrast images (B, D, F) making intracranial hemorrhage less likely.

Given dual energy imaging finding and clinical history, the differential diagnosis is **highly indicative of intracranial migration of silicone oil** instead of intracranial hemorrhage.



Conclusion

- Neurosurgery service was consulted in case of traumatic brain injury.
- Dual Energy CT Virtual Non-Contrast imaging definitively ruled out intracranial hemorrhage and neurosurgery service was no longer needed.
- No further imaging is necessary as diagnosis of silicone oil migration was made.
- The patient was examined with serial neurological examinations.
- Physical examination confirmed that patient was stable and in no acute distress.

Outcome

- Patient discharged in stable condition with no follow up necessary.
- Interval symptomatic follow-up was recommended to the patient as clinically indicated.

Take Home Points

- Silicone oil for retinal detachment has been performed since 1962 with limited reports on its migration from the eye's vitreous chamber to the optic nerve, optic chiasm, and brain ventricular system.[1] On imaging, **silicone oil appears as a hyperattenuating foci, often confused with intracerebral hemorrhage or neoplasms**.[2]
- In the past, this unique neuroradiological finding of **intracranial silicone oil migration mimicking intracranial hemorrhage posed major clinical risk specifically for stroke patients.** In patients with histories of retinal surgery presenting with acute stroke symptoms, misinterpretation of this finding for hemorrhaging could cause **critical delays in thrombolytic administration, reversal of antiplatelets or anticoagulants and invasive neurosurgical workups.**[3] Recognizing this phenomenon is essential, especially in individuals with a history of cardiovascular and ocular conditions.
- Although rare, the ER and neurologists should be aware of the potential for silicone oil migration to mimic intracerebral hemorrhage or neoplasms on traditional non-contrast imaging, which can significantly impact the management of stroke patients eligible for thrombolysis. In this case, the use of dual energy imaging was used to definitively distinguish hemorrhage from intracranial oil which was important for this patient given her history of CAD with blood thinners.

References

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2. Menghani, D., & Lee, J. (2025). Neuroradiological mimic: Intracranial silicone oil migration mimicking intracerebral hemorrhage (P4-2.009). Neurology, 104(7_Supplement_1), 67. https://doi.org/10.1212/WNL.0000000000208375
3. Zhong, H., Bianchi, C. M., Patel, S. J., Wolfe, A. R., & Visvikis, G. A. (2019). Intracranial migration of intraocular silicone oil following repetitive head trauma. Radiology Case Reports, 14(9), 1163–1166. https://doi.org/10.1016/j.radcr.2019.06.026

Thank You!