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Case Report

Retrolaminar chiasmal migration of intraocular silicone oil masquerading as subarachnoid hemorrhage on CT head ☆

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ABSTRACT

Silicone oil is used as a long-term treatment agent for intraocular tamponade to repair retinal detachments following vitrectomy. Retrolaminar migration of oil into the optic nerve is a rare complication, with migration into the optic chiasm being even more rare. Following imaging, this entity can be misdiagnosed as acute hemorrhage, aneurysm, or neoplasm on imaging possibly leading to delay of care or unnecessary interventions. We will discuss a case where the imaging findings were thought to represent a small acute subarachnoid hemorrhage possibly related to an aneurysm involving the distal right internal carotid artery.

Introduction

Retinal detachment is often treated with intravitreal injection of silicone oil (SiO). SiO is used as a long-term agent for intraocular tamponade to repair retinal detachments following vitrectomy. Some complications of SiO injection include cataracts, glaucoma, and retrolaminar oil migration. Retrolaminar migration of oil into the optic nerve is a rare complication of this procedure. Further intracranial migration of SiO into the optic chiasm is even rarer with only about 20 case reports describing this phenomenon. This complication can cause vision loss due to silicone induced optic neuropathy [1,2]. SiO migration may be detected by radiologists incidentally on cross-sectional imaging. This entity can be misdiagnosed as acute hemorrhage, aneurysm, or neoplasm on imaging [3]. In the patient described in this report, the SiO was initially thought to represent subarachnoid hemorrhage and/or an aneurysm.

☆ Competing Interests: The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be a potential conflict of interest.

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Case report

A 64-year-old male with a past medical history of seizures, alcohol abuse, and right retinal detachment presented to an outside hospital after a witnessed seizure. The patient had a low Glasgow Coma Scale score of 3 and altered mentation. He was intubated for airway protection and a CT head without contrast was obtained. The CT showed a dense structure in the right aspect of the suprasellar cistern (Fig. 1). The interpreting radiologist thought that this likely represented small acute subarachnoid hemorrhage possibly related to an aneurysm involving the distal right internal carotid artery.

The patient was transferred to the hospital's neuro intensive care unit for higher level care with a working diagnosis of subarachnoid hemorrhage. On arrival, the patient was not awake though responded to pain in all extremities. The right pupil was non-reactive, whereas the left pupil was reactive to light with a weakly positive ocular counter roll.

Given the concern for a cerebral aneurysm, CT angiography of the head was performed. The CT angiography showed no evidence of aneurysm and no vascular abnormality was seen in the region of the dense material in the suprasellar cistern. The patient was noted to have dense material within the right globe on CT consistent with prior SiO injection for treatment of retinal detachment (Fig. 2). The CT also showed dense material in the intraorbital segment of the right optic nerve consistent with retrolaminar migration of SiO. The constellation of the above findings was consistent with migration of SiO into the right aspect of the optic chiasm (Fig. 3).

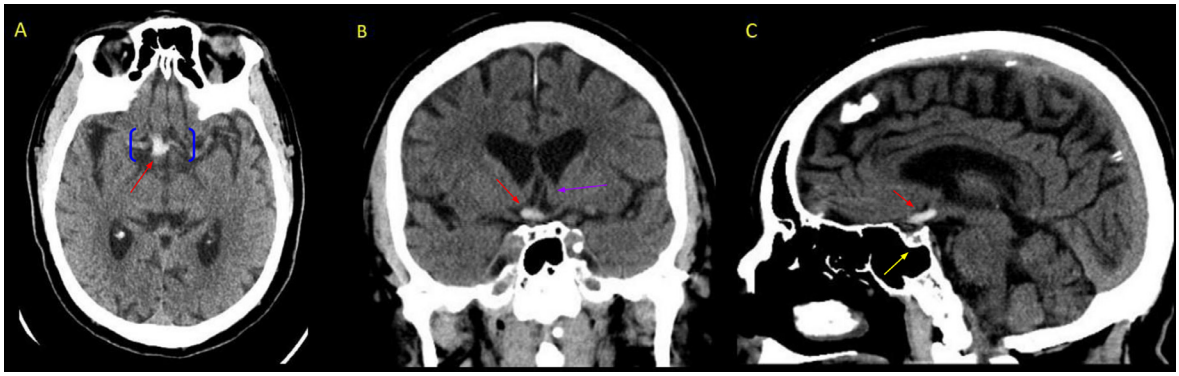

Fig. 1 – STAT CT head without contrast. CT of the head from an axial view (A), a coronal view (B), and a sagittal view (C). The red arrow indicates the silicone oil in all views, and is high density that can be seen in the right aspect of the optic chiasm as well as in the adjacent portions of the right optic nerve and optic tract. Without proper knowledge of patient history, the hyperintensity can be mistaken as a hemorrhage or an aneurysm. The blue brackets demonstrate the suprasellar space. The purple arrow demonstrates the anterior cerebral artery. The yellow arrow demonstrates the sella.

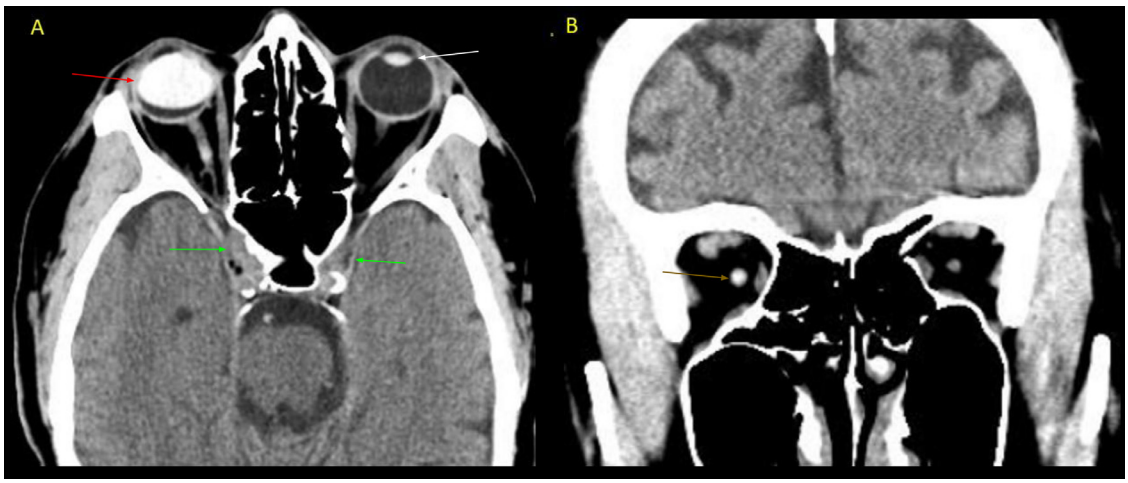

Fig. 2 – CT angiogram of the head following transfer to the neuro ICU. CT angiogram images with an axial view (A) and coronal view (B). Images show high-density silicone, red arrow, in the right ocular vitreous cavity related to prior silicone oil injection for treatment of retinal detachment. There is also migrated silicone in the intraorbital segment of the right optic nerve. The brown arrow demonstrates the optic nerve. The white arrow represents the lens. The green arrows point to the cavernous sinus.

Fig. 3 – Axial view of CT angiography with contrast. CT angiography demonstrates that the lesion, red arrow, in the right optic chiasm and right ocular vitreous cavity does not enhance with contrast. There is no evidence of cerebral aneurysm or vascular malformation. The purple arrow shows the middle cerebral artery.

Based on clinical assessment, the patient was diagnosed with alcohol withdrawal seizures. He improved the following day and was extubated. The patient was noted to have chronic vision loss in the right eye. Otherwise, there were no focal neurological deficits. The patient was discharged home in a stable condition.

Discussion

Retinal detachment occurs due to subretinal fluid accumulation between the neurosensory retinal layer and retinal pigment epithelium layer. Rhegmatogenous detachment, the most common form, occurs when there is a tear in the peripheral retina leading to fluid accumulation [4]. Symptoms include progressive vision loss and has an incidence in about 1:10,000 [5]. Most repairs of retinal detachment are by scleral buckling. Intraocular tamponade with injection of SiO is used less frequently and in more complex cases. Side effects of SiO injection include intraconjunctival oil inclusion cysts, subretinal oil, SiO keratopathy, cataract formation, optic atrophy, and retrolaminar migration [6]. The retrolaminar migration of SiO is a rare complication following injection and SiO may travel to the optic nerve, chiasm, tract, or subarachnoid space or ventricles. The exact mechanism of this migration is not entirely understood as there is no anatomical connection between the vitreous and subarachnoid space. Factors such as long-term increased intracranial pressure, congenital abnormalities in the optic nerve, or damage to the optic nerve can predispose patients to this complication [7].

On a noncontrast CT scan of the head, SiO oil is found to be a hyperdense lesion ranging from 50 to 130 HU [8]. Because of this, it can be misread as an intraventricular hemorrhage, vitreous hemorrhage, or an aneurysm. On MR T1, SiO will appear as hyperintense to normal vitreous fluid while blood will appear as isointense to hyperintense at less than 2-3 weeks old. On MR T2, SiO will appear variable as will blood. An MR diffusion restriction study will show no restriction with SiO and variable restriction with blood. Nuclear magnetic resonance spectroscopy will show a chemical shift with SiO and will have no shift with blood [9].

SiO migration is associated with visual loss. When detected incidentally on imaging in a patient with chronic vision loss, no further work up or intervention is warranted.

Conclusion

It is important for radiologists to recognize intracranial migration of SiO and not mistake this entity for subarachnoid hemorrhage or an aneurysm. In our case, the SiO migration was thought to represent a small acute subarachnoid hemorrhage possibly related to an aneurysm involving the distal right internal carotid artery. Eliciting a thorough history of past retinal repair with SiO tamponade can prevent unnecessary interventions or delays in care.

Patient consent

The ethical review and approval was not required for the study on human participants in accordance with institutional requirements and local legislation. The patient provided their written informed consent to participate in this study. Written informed consent was obtained from the individual for the publication of any potentially identifiable images or data included in this article.

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