Micropsia as a Rare Manifestation of Occipital Stroke

Neuro-ophthalmology

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INITIAL PRESENTATION

Chief Complaint: Tunnel vision and micropsia

History of Present Illness:

A 71-year-old female with a history of pigmentary glaucoma and pseudophakia presented to neuro-ophthalmology clinic 12 days after a right occipital stroke. At the time of the stroke, the patient had experienced two episodes of tunnel vision for 45 minutes on two consecutive days. She also described seeing things appear smaller than they actually were during these episodes. She mentioned the television appeared to be smaller than it had previously looked and noted the road seemed very small during one episode when she was driving. She had no dizziness, lightheadedness, or tinnitus with these episodes. She was evaluated in the emergency department and admitted overnight.

Neurology was consulted for suspected stroke. Magnetic resonance imaging (MRI) demonstrated positive restricted diffusion involving the right lateral occipital lobe and enhancement on the fluid-attenuated inversion recovery (FLAIR) sequence, consistent with an infarct measuring about 2 cm. Magnetic resonance angiography showed no large vessel occlusion. She was discharged on aspirin 81 mg and Plavix 75 mg. Simvastatin was switched to atorvastatin 40 mg. She was also given a cardiac monitor to complete two weeks of monitoring.

In clinic, the patient stated her vision was good and prior symptoms had resolved. She denied any tunnel vision, micropsia, distortion, or scotomas. She felt her visual acuity had decreased, particularly at reading distance, and she requested a new glasses prescription.

Past Ocular History:

- Pigmentary glaucoma, both eyes
- Pseudophakia, both eyes

Past Medical History:

- Type 2 diabetes with neuropathy
- Sleep apnea
- Hypertension
- Hyperlipidemia
- Transient ischemic attack

Medications:

- Atorvastatin 40 mg daily
- Aspirin 81 mg daily
- Clopidogrel 75 mg daily
- Metformin 500 mg daily
- Lisinopril 20 mg daily
- Dorzolamide 22.3/timolol 6.8 mg BID
- Gabapentin 300 mg

Family History:

- Father: unknown medical history
- Mother: dementia, hypertension, prediabetes
- Siblings: 6 siblings. Ovarian cancer in sister

Social History:

- Divorced, re-married, and lives with husband and granddaughter.
- Retired, worked at Amana factory for 42 years
- Former smoker, quit age 25
- Social alcohol use

OCULAR EXAMINATION

- **Visual Acuity:**
  - With correction: Right eye (OD) 20/40 -2+1; left eye (OS) 20/40-2+2
  - Pinhole: OD 20/30-2; OS 20/30-1
- **Tonopen Intraocular Pressure (IOP):**
  - OD: 25 mmHg
  - OS: 23 mmHg
- **Slit Lamp Exam:**
  - Lids and lashes: Normal both eyes (OU)
  - Conjunctiva and sclera: Clear without erythema OU
  - Cornea: Suture in place, trace pigment OD; clear OS
  - Anterior chamber: Deep single cell with no flare OD; deep and quiet OS
  - Iris: Pupillary transillumination defects OU
  - Lens: Sulcus lens centered and clear, diffuse capsular folds, inferior break in posterior capsule OD; 2+ nuclear sclerosis, cortical changes, few vacuoles OS
- **Fundoscopic Exam:**
  - Media: Clear OU
  - Disc: Pink, sharp border, peripapillary atrophy OU
  - Cup to disc ratio: 0.3, cupped OU
  - Vessels: Normal OU
  - Macula: Normal OU
  - Periphery: Normal OU

DIFFERENTIAL DIAGNOSIS:

- Alice in Wonderland syndrome
- Migraine
- Seizure
- Vascular malformation
- Stroke
- Tumor

CLINICAL COURSE

The patient was scheduled for neurology follow-up for long-term secondary stroke prevention and risk factor management. At a two-week follow-up with ophthalmology, the patient reported complete resolution of visual symptoms. She was referred to the glaucoma service for ongoing evaluation and management of bilaterally elevated IOP and a known history of pigmentary glaucoma. She was also referred to optometry for an updated manifest refraction.

DIAGNOSIS: Right Occipital Stroke

DISCUSSION

Epidemiology

Stroke is the second leading cause of death globally and kills about 5.5 million Americans annually. Occipital strokes are rare, with less than 10% of all ischemic strokes occurring in the occipital region (1). Occipital lobe infarction may be associated with younger age and female sex compared to infarctions in other brain regions (2). Dysmetropsias including micropsia and macropsia can sometimes be a rare symptom of occipital stroke or other neurological conditions. Minimal data exists on the incidence of these symptoms in the general population.

Etiology/Pathophysiology

Occipital strokes are caused by ischemia or hemorrhage in the occipital region of the brain. About 85% of strokes are caused by ischemia, with the remaining 15% caused by hemorrhage (3). Occipital strokes caused by ischemia are typically the result of occlusion in the posterior cerebral artery (PCA). Ischemia in the PCA can result from large vessel disease, atherothrombosis, or embolism from a cardiac source or underlying coagulopathy. Large artery disease commonly results from thromboses from atherosclerotic plaques. Cardiogenic embolic sources most commonly result from atrial fibrillation, but can also be caused by valvular disease, dilated cardiomyopathy, left atrial or ventricular thrombus, patent foramen ovale (PFO), or congestive heart failure (4).

Signs/Symptoms

Unilateral occipital strokes most commonly present with contralateral homonymous hemianopia. Additional symptoms of posterior circulation infarctions may include vertigo, ataxia, vomiting, and headache (5). Although less common, occipital strokes have been associated with neuropsychiatric manifestations, including visual and auditory hallucinations and acute psychosis (6). Behavioral changes such as increased talkativeness, memory impairment, echolalia, disorientation, and aggression have also been reported in the setting of posterior circulation strokes (6,7).

Visual perceptual distortions, such as dysmetropsia—which includes micropsia, macropsia, teleopsia, and pelopsia—are rarely seen in stroke but may occur with occipital lobe involvement. These illusions are more commonly linked to retinal disease, epilepsy, migraines, neoplasms, viral infections (e.g., EBV, influenza), psychoactive drugs (e.g., mescaline), toxic-metabolic disorders, and various psychiatric illnesses (8).

Dysmetropsias can also be seen in Alice in Wonderland Syndrome (AIWS). This syndrome is a rare condition that disrupts the way the brain processes sensory information. It was first described in 1955 by English psychiatrist John Todd, who named the condition after the children's novel *Alice's Adventures in Wonderland*, in which Alice experiences changes in her body size (9,10). AIWS is often seen in young patients with migraine and involves visual illusions in one’s body shape, mass, or size. It is often accompanied by depersonalization or derealization in which the individual feels disconnected from their own body and/or the world around them (9). These symptoms are typically short-lived and self-resolve.

Testing/Laboratory Workup

Patients suspected of having acute stroke should have prompt imaging with non-contrast computed tomography (CT) to rule out acute hemorrhage. The Alberta Stroke Program Early CT Score (ASPECTS), a 10-point scale for evaluating early ischemic changes in acute middle cerebral artery stroke is modified to pc-ASPECTS for posterior circulation strokes. Additional imaging including CT angiography or MRI may be needed to diagnose/localize the stroke. Blood tests including a complete blood count, prothrombin time, activated partial thromboplastin time, international normalized ratio, electrolytes, comprehensive metabolic panel, troponin, lipid panel, and hemoglobin A1c are done to evaluate the underlying etiology of an occipital stroke. Cardiogenic etiology of stroke can be evaluated with chest X-ray, electrocardiogram, transthoracic echocardiogram, transesophageal echocardiogram, or Holter monitoring (4).

Treatment/Management

After hemorrhage has been ruled out, intravenous (IV) tissue plasminogen activator (tPA) can be given within 4.5 hours of onset of symptoms if no contraindications are present such as blood pressure greater than 180/110 or finger-stick glucose less than 50 mg/dL. Endovascular treatment can sometimes be done acutely to restore perfusion to the ischemic brain region. Endovascular options include angioplasty, stenting, mechanical embolectomy, or intra-arterial thrombolysis (4).

PCA strokes pose unique challenges to acute treatment compared to strokes in other brain regions due to the low NIH stroke scale, often unclear timing of onset of symptoms, and the small size of the vessel (4). While endovascular interventions are more commonly done on strokes involving the middle cerebral artery (MCA), some studies suggest positive outcomes when done on PCA strokes. One study found intra-arterial thrombolysis to be superior to IV thrombolysis in 18 patients with isolated PCA

infarction (11). Another case study of isolated PCA stroke showed improvement in the patient's symptoms with endovascular clot aspiration (12). More studies are needed to further determine the efficacy of endovascular treatment for PCA strokes involving the occipital region.

Long-term management is targeted towards the prevention of future strokes. Antiplatelet and/or anticoagulation therapies may be initiated depending on the etiology of the stroke. Other secondary risk factors should also be addressed, including management of hypertension, hyperlipidemia, and diabetes.

This case highlights a rare presentation of micropsia associated with occipital infarction, underscoring the importance of considering neuroimaging in adult patients presenting with new onset dysmetropsia. Although often benign in children with migraines, these visual phenomena in adults may signify underlying structural pathology, including stroke, and warrant prompt evaluation.

EPIDEMIOLOGY/ETIOLOGY	SIGNS
• Occipital strokes comprise <10% of all ischemic brain infarctions • No good data on the prevalence of micropsia, a rare manifestation	• Contralateral homonymous hemianopia • Dysmetropsia including micropsia
SYMPTOMS	**TREATMENT/MANAGEMENT**
• Visual field defects • Headache • Vertigo • Ataxia • Auditory/visual hallucinations (rarely)	• Urgent imaging with non-contrast CT, followed by CT angiography or MRI • Possible success with endovascular treatment, although more challenging with occipital infarcts compared to other large vessel occlusive disease • Secondary stroke prevention with antiplatelet and/or anticoagulation and risk factor management

References

1. Tharaldsen, A.R., Kurz, K.D., Kurz, M.W., Midelfart, A., Sand, K.M., Dalen, I., Hoff, J.M. (2023). Volume and Visual Field Defects in Occipital Stroke: The NOR-OCCIP Study. *Acta Neurologica Scandanavic.* **https://doi.org/10.1155/2023/3564863**
2. Naess, H., Waje-Andreassen, U., & Thomassen, L. (2007). Occipital lobe infarctions are different. *Vascular health and risk management*, *3*(4), 413–415.
3. Kuriakose, D., & Xiao, Z. (2020). Pathophysiology and Treatment of Stroke: Present Status and Future Perspectives. *International journal of molecular sciences*, *21*(20), 7609. https://doi.org/10.3390/ijms21207609
4. Kuybu, O., Tadi, P., & Dossani, R. H. (2023). Posterior Cerebral Artery Stroke. In *StatPearls*. StatPearls Publishing.
5. Khanra, S., Paul, N., & Mukherjee, S. (2018). Early Marked Behavioral Symptoms in Bilateral Posterior Cerebral Artery Stroke: A Disguised Presentation. *Indian journal of psychological medicine*, *40*(1), 96–98. https://doi.org/10.4103/IJPSYM.IJPSYM_116_17
6. Ido, F., Badran, R., Dmytruk, B., & Kulairi, Z. (2018). Auditory Hallucinations as a Rare Presentation of Occipital Infarcts. *Case reports in neurological medicine*, *2018*, 1243605. https://doi.org/10.1155/2018/1243605
7. Botez, S. A., Carrera, E., Maeder, P., & Bogousslavsky, J. (2007). Aggressive behavior and posterior cerebral artery stroke. *Archives of neurology*, *64*(7), 1029–1033. https://doi.org/10.1001/archneur.64.7.1029
8. Montalvo, M. J., & Khan, M. A. (2014). Clinicoradiological Correlation of Macropsia due to Acute Stroke: A Case Report and Review of the Literature. *Case reports in neurological medicine*, *2014*, 272084. https://doi.org/10.1155/2014/272084
9. Lanska, J.R., Lanska, D.J. (2013). Alice in Wonderland Syndrome: Somesthetic vs visual perceptual disturbance. *Neurology, 80*(13), 1262-1264. https://doi-org.proxy.lib.uiowa.edu/10.1212/WNL.0b013e31828970ae
10. Blom JD. Alice in Wonderland syndrome: A systematic review. *Neurol Clin Pract*. 2016;6(3):259-270. doi:10.1212/CPJ.0000000000000251
11. Meier N, Fischer U, Schroth G, Findling O, Brekenfeld C, El-Koussy M, De Marchis GM, Mono ML, Jung S, Gralla J, Nedeltchev K, Mattle HP, Arnold M. Outcome after thrombolysis for acute isolated posterior cerebral artery occlusion. Cerebrovasc Dis. 2011;32(1):79-88.
12. Yamamoto T, Ohshima T, Sato M, Goto S, Ishikawa K, Nishizawa T, Shimato S, Kato K. A Case of Acute Isolated Posterior Cerebral Artery Occlusion Successfully Treated with Endovascular Clot Aspiration. NMC Case Rep J. 2017 Apr;4(2):55-58.

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