Incipient non-arteritic anterior ischemic optic neuropathy (NAION) evolving to symptomatic NAION

Jonathan A. Micieli, MD
Valérie Biousse, MD
A 54 year old white woman is referred to neuro-ophthalmology for left optic disc edema discovered incidentally on a routine eye examination. She is asymptomatic.

She has a past medical history of hypertension.

Visual acuity is 20/20 OD, 20/20 OS.

There is no relative afferent pupillary defect.

Color vision is 14/14 OD, 14/14 OS correct Ishihara plates.
Figure 1

Right eye

Left eye
There is diffuse optic disc hyperemia and mild edema in the left eye (red arrows). The right eye has a small cup-to-disc ratio of 0.1.
Figure 2

24-2 SITA-Fast Humphrey visual fields

Left eye

Right eye
Figure 2

24-2 SITA-Fast Humphrey visual fields are normal in both eyes.
MRI of the orbits with contrast (T1 with fat suppression post contrast) was normal. There was no optic nerve sheath meningioma. The brain MRI was also normal and did not show signs of chronically elevated intracranial pressure.
1 month later she suddenly loses vision in the upper part of her visual field in the left eye.

Visual acuity 20/20 OD, 20/20 OS

Left 0.3 log unit relative afferent pupillary defect

Color vision 14/14 OD, 14/14 OS correct Ishihara plates
There is an increase in the optic disc edema compared to her initial visit (left), with more prominent swelling in the inferior part of the optic nerve and a new disc hemorrhage (red arrow).
Figure 5. Intravenous fluorescein angiography (left eye)
Intravenous fluorescein angiography confirms the disc edema by demonstrating leakage (an increase in the intensity and size of hyperfluorescence) with time. There is an area of hypofluorescence or blockage (red arrow) that represents the new disc hemorrhage.

Figure 5.
Figure 6.

24-2 SITA-Fast Humphrey visual fields
Humphrey visual fields show a left altitudinal visual field defect corresponding to the prominent inferior optic disc edema.
1 month later she loses vision in the lower part of her visual field in the left eye.

Visual acuity is 20/20 OD, 20/20 OS.

There is a left 0.9 log unit relative afferent pupillary defect.

Color vision is 14/14 OD, 14/14 OS correct Ishihara plates.
Figure 7.

Right eye

Left eye
Initial visit (asymptomatic)

1 month after initial visit

Current visit
2 months after initial visit
At the current visit, there is improvement of the inferior disc edema previously seen and optic disc pallor is now evident (yellow arrow). There is an increase in the edema at the superior part of the optic nerve (red arrow) and small exudates (blue arrow).
Figure 9. 24-2 SITA-Fast Humphrey visual fields

Left eye

Right eye
Figure 9.

Left eye

Right eye

24-2 SITA-Fast Humphrey visual fields show generalized depression in the left eye.
She returns for follow-up 6 weeks later, and she feels she has had a spontaneous small improvement in her vision in the left eye.

Visual acuity is 20/20 OD, 20/20 OS.

There is a left 1.2 log unit relative afferent pupillary defect.

Color vision is 14/14 OD, 14/14 OS correct Ishihara plates.
Figure 10.

Right eye

Left eye
The left eye optic disc edema has resolved and there is now diffuse pallor.
Figure 11.

24-2 SITA-Fast Humphrey visual fields

Left eye

Right eye
There is improvement in the left eye visual field compared to the previous visit.
Figure 12.
Summary points:
This case demonstrates several important aspects of NAION:

- Patients with NAION have small, crowded optic nerves (a “disc at risk”), which was seen in this patient’s fellow eye (and was presumably there in the affected eye before the optic disc edema occurred).

- Patients may initially have asymptomatic disc edema ("incipient NAION"). This should be a diagnosis considered in a patient with a “disc at risk” only after other causes such as an optic nerve sheath meningioma have been excluded with an MRI of the brain and orbits with contrast.

- Vision may worsen when there is disc edema present, as seen in this patient.

- The optic disc edema resolves in approximately 6 to 11 weeks and this is followed by optic disc pallor. If the edema does not resolve in this time period, other causes should be considered.

- After the disc edema resolves, a second NAION event in the same eye is rare since the optic atrophy that develops leads to a small enlargement of the cup and the patient no longer has a “disc at risk”.