

# Anterior Ischemic Optic Neuropathy Following Abortion Related Severe Hemorrhage

Abortusa Bağlı Ciddi Kanamayı Takiben Gelişen Ön İskemik Optik Nöropati

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Case Report

Olgu Sunumu

## ABSTRACT

Nonarteritic anterior ischemic optic neuropathy (NAION) is usually considered as a disease of aged and atherosclerotic patients. Nevertheless it has been well documented in postoperative, post hemorrhagic and hypovolemic cases in young patients. Here we report a case of a NAION developing after an abortion related massive hemorrhage in a 34 year-old patient. Visual acuities of the patient who presented with visual loss in her left eye, were 20/20 in the right eye and hand motions in the left eye, at presentation. Ophthalmic examination revealed bilateral optic disc edema and peripapillary hemorrhages. Following management of systemic hypotension and anemia she was treated with systemic corticosteroids. Finally, she was recovered with a pale optic disc and visual acuity of 20/80 in her left eye. NAION should be in the differential diagnosis of visual loss after severe hemorrhage in young patients and corticosteroids may play an important role in the treatment plan.

**Key Words:** Anterior ischemic optic neuropathy, abortion, severe hemorrhage.

## ÖZ

Arteritik olmayan ön iskemik optik nöropati (AÖİON) genellikle ileri yaştaki ve aterosklerotik hastaların bir hastalığı olarak kabul edilir. Buna karşın genç hastalarda cerrahi sonrası, kanama sonrası ve hipovolemi durumlarında da iyi tarif edilmiştir. Burada 34 yaşında bir hastada abortusa bağlı ciddi kanama sonrası gelişen bir AÖİON olgusu sunulmaktadır. Başvuru sırasında hastanın görme keskinlikleri sağ gözde 20/20, sol gözde el hareketleri düzeyindedeydi. Oftalmik muayenesinde iki taraflı disk ödemi ve papapiller kanamalar mevcuttu. Sistemik hipotansiyon ve aneminin düzeltilmesini takiben sistemik kortikosteroid ile tedavi edilen hasta sol gözde soluk bir optik disk ve 20/80 görme keskinliği ile iyileşti. Ciddi kanama sonrası görme kaybı gelişen genç hastalarda AÖİON ayırıcı tanıda bulunmalıdır ve kortikosteroidler tedavi planında önemli bir rol oynayabilirler.

**Anahtar Kelimeler:** Ön iskemik optik nöropati, abortus, ciddi kanama.

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## INTRODUCTION

Nonarteritic anterior ischemic optic neuropathy (NAION) is an ischemic process of the anterior portion of the optic nerve which is characterized by sudden and painless visual loss. NAION typically affects older persons and associated with various risk factors including advanced age, diabetes mellitus, systemic hypertension and abnormal optic disc morphology (small and crowded discs). However, a rare form of NAION related to hypotension and hypovolemia has been reported in younger patients without pre-existence of other risk factors.<sup>1-5</sup> Here we report a patient who developed NAION after severe hemorrhage related to abortion that was resulted in visual impairment. To our knowledge this is the unique case represented after abortion.

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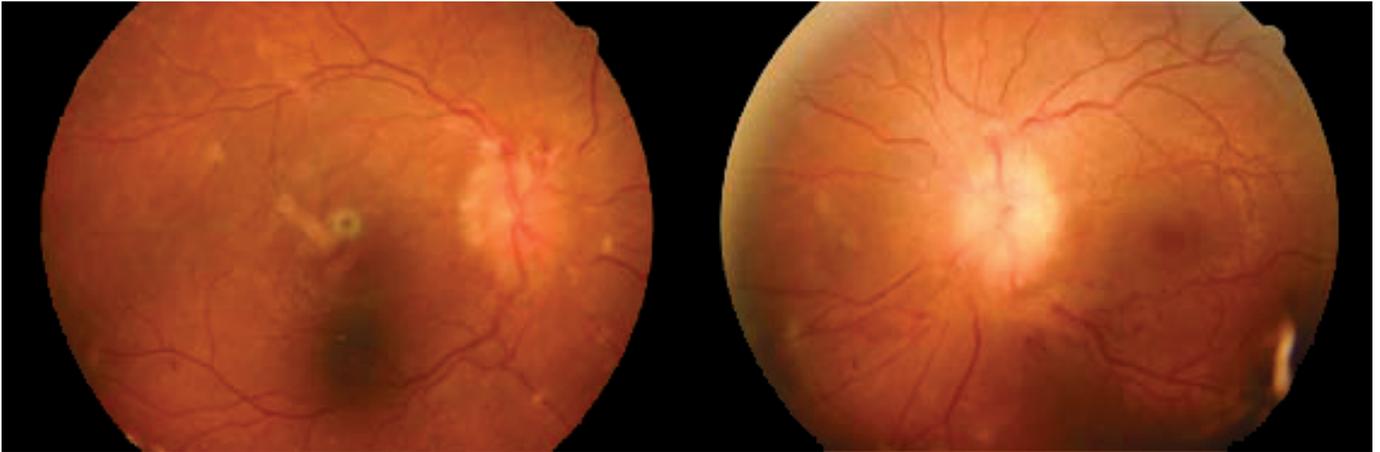
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**Figure 1:** Fundus photographs at the time of diagnosis demonstrate bilateral optic disc edema and peripapillary hemorrhages.

### CASE REPORT

A 34-year-old woman with visual loss in her left eye was referred to our clinic 3 days after undergoing an abortion. Her medical history was unremarkable. She had 4 healthy children and no history of a prior abortion. During this fifth pregnancy recurrent vaginal bleeding began during the fourth gestational week, complicated the pregnancy until an abortion was performed at the 20<sup>th</sup> week due to placenta previa. Presumed uterine atony lead to postabortal massive hemorrhage. Her hemoglobin level was 6.4 g/dl. Her lowest blood pressure level was 90/45 mmHg, which necessitated an infusion of 3 units of packed red blood cells; the next day, her hemoglobin level was 9.1 g/dl, and blood pressure was 120/65 mmHg. Initial ophthalmic examination revealed a visual acuity of 20/20 OD and hand movements OS. There was a marked left relative afferent pupillary defect. Slit-lamp biomicroscopy of anterior segment were bilaterally normal. Dilated fundus examination showed bilateral swollen, hyperemic optic discs and peripapillary flame-shaped hemorrhages (Figure 1). Results of color vision and visual field tests were normal in the right eye but could not be performed in the left eye owing to low vision. Results of brain magnetic resonance imaging (MRI) and venography were normal. A lumbar puncture revealed clear and colorless cerebrospinal fluid with a normal opening pressure.

With these findings, the patient was diagnosed as NAION in the left eye and incipient NAION in the right eye. Intravenous high-dose corticosteroid therapy (1000 mg/day) was administered for 3 days followed by oral corticosteroid treatment (1mg/kg) for 11 days. On the sixth day, optic disc edema regressed bilaterally, and visual acuity improved to finger counting at 2 meters, OS. At the third week, in the left eye, visual acuity was 20/80. Visual field test showed only a small spared area in the nasal region. A persistent relative afferent pupillary defect was present. Color vision was completely deficient, and optic disc edema was almost resolved OS. 2 months since the onset of condition, fundus examination showed a normal optic disc OD, and pale optic disc OS (Figure 2).

### DISCUSSION

Anterior ischemic optic neuropathy is the result of partial or total infarction of the optic nerve head caused by occlusion of the short posterior ciliary arteries. Temporal arteritis is responsible from the arteritic form that necessitates immediate corticosteroid therapy to prevent further damage, either in the affected or fellow eye. Non-arteritic form is frequently encountered in patients over 50 years old where the main predisposing risk factors are the atherosclerotic ones.



**Figure 2:** Fundus photographs at 2 months demonstrate a normal optic disc in the right and a marked pale optic disc in the left eye.

On the other hand NAION has been well documented in younger patients occurred after various causes of systemic hypotension and hypovolemia including trauma, hemodialysis or in association with certain surgical procedures.<sup>5</sup> Obstetric and gynecology is one of the fields that patients suffer from NAION as a result of postpartum hemorrhage, severe pre-eclampsia, ruptured ectopic pregnancy and abdominal hemorrhage after laparotomy for uterine myoma. Though it has not been reported previously as a complication of abortion.<sup>1-4</sup> Since NAION is frequently a unilateral condition, bilateral optic disc edema encountered in our patient raised a suspect of cerebral venous thrombosis (CVT). CVT is a disease with potentially serious consequences and usually affecting young to middle aged people with a predilection of female gender and pregnancy/puerperium period. Bilateral papilledema is a sign of increased intracranial pressure. The best radiological examination to exclude CVT is MRI of the brain where parenchymal lesions and sinus occlusions could be demonstrated.

The pathologic mechanisms causing ischemic damage in NAION can be listed as; fall of perfusion pressure below the critical level, vasoconstriction of vessels in the optic nerve head, failure of autoregulation and increased peripheral vascular resistance. Combination of these factors cause altered blood flow to the optic nerve head and axonal ischemia.<sup>6</sup> Ischemia of axons in NAION results in axoplasmic flow stasis, which in turn causes axoplasmic accumulation and consequent axonal swelling in the optic nerve head; that manifests as optic disc edema. In a healthy, young individual, recurrent hemorrhages (as in our patient) prior to a massive blood loss may be an important facilitating factor in developing NAION.<sup>6</sup> Release of endogenous vasoconstricting agents after recurrent hemorrhages could lead to vasoconstriction of parapapillary choroidal vessels and resultant ischemia of the optic nerve head.<sup>6</sup>

Hayreh and Zimmerman introduced the term incipient NAION in patients with asymptomatic optic disc edema and no visual loss in one eye who have had classic NAION in the fellow eye.<sup>7</sup> This entity complies well with our patient's right eye with preserved visual acuity and visual field despite the presence of edematous and hemorrhagic optic nerve head. Probably symptomatic treatment and corticosteroid therapy prevent the patient from progression to classical type of NAION. Several treatment modalities including optic nerve decompression, standard dose systemic corticosteroids, anticoagulants and hyperbaric oxygen has been utilized in order to restore visual loss related to NAION in the past decades, though none of them have been found to be clinically beneficial.<sup>8</sup> More recently intravitreal injections of steroids or anti-vascular endothelial growth factor (anti-VEGF) agents have been attempted. Although the rationale for intravitreal steroids is the same as for systemic steroids, increased risk of elevated intraocular pressure that may worsen the optic nerve head ischemia seems

to be a major handicap.<sup>9,10</sup> Anti-VEGF agents decrease microvascular permeability which may be effective in reducing the vasogenic edema that manifests as optic disc edema but more reports are required to make a decision.<sup>11,12</sup> Finally intravitreal erythropoietin may be a promising component of treatment with its potent neuroprotective and neuroregenerative properties in the nervous system.<sup>13</sup> Correcting hypotension and anemia in postoperative and post hemorrhagic NAION cases should be the first step of the treatment. Consequently a vicious circle formed by the optic nerve edema and compression of capillaries aggravating ischemia that worsen the disease outcome should be broken as the following step of NAION treatment. At this point corticosteroids should be considered on the basis of their significant anti-edema effect. Although there is still no proven therapy for NAION, the encouraging results of systemic corticosteroid treatment in Hayreh's paper made this agent a favorable option for the patients.<sup>14</sup> The suggestion of the authors that "the sooner the treatment is started, the better the chance of improvement" may be result of limited visual recovery in our patient where the corticosteroid treatment was initiated 3 days after.

In conclusion, clinicians should be aware of the increased risk of NAION in patients complaining visual disturbances those with a history of recurrent and/or massive hemorrhages. High-dose intravenous corticosteroids may be considered as a treatment option.

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