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Sudden painless vision loss as the first manifestation of granulomatosis with polyangiitis — a case report

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Abstract

Granulomatosis with polyangiitis (GPA) may manifest in the organ of vision, causing a rare type of small-vessel vasculitis, ischaemic optic neuropathy and central retinal artery occlusion, i.e. disease entities whose inflammatory form is identified with giant-cell arteritis in many studies.

Here we present the case of a 58-year-old female patient with sudden painless vision loss in the left eye, followed by sudden painless vision deterioration in the right eye, who was diagnosed with GPA with pulmonary and renal involvement, arteritic anterior ischaemic optic neuropathy (AAION), central retinal artery occlusion (CRAO) and suspected cardiac involvement, with associated ischaemic stroke. This case represents a very rare manifestation of ocular involvement in GPA and demonstrates the need for a differential diagnosis, including small- and medium-vessel vasculitis, for AAION and CRAO.

Key words: granulomatosis with polyangiitis; ischaemic optic neuropathy; central retinal artery occlusion

Introduction

Granulomatosis with polyangiitis (GPA) is a necrotising granulomatous inflammation and necrotising small- and medium-vessel vasculitis. It typically affects the upper and lower respiratory tract and kidneys but can involve multiple systems, including the eyes, skin, musculoskeletal system, nervous system, oral mucosa, heart, gastrointestinal tract, and genitourinary system [1]. The most common ocular manifestations include conjunctivitis, episcleritis, scleritis, optic neuritis, peripheral ulcerative keratitis, retrobulbar tumour and uveitis [2]. Arteritic anterior ischaemic optic neuropathy (AAION) and central retinal artery occlusion (CRAO) can be manifestations of vasculitis. Although most common in giant-cell arteritis (GCA), they are also found in other types of vasculitis [3], including GPA [4–6].

AAION involves the intraocular segment of the optic nerve due to impaired flow in the short posterior ciliary arteries. Visual deterioration is sudden and acute, may be accompanied by pain, and is often preceded by visual disturbances. The examination reveals reduced visual acuity, impaired colour discrimination and pupillary light reflex, and visual field loss. Ophthalmoscopy reveals a swollen and pale optic nerve disc; small haemorrhages or cotton wool spots may be present near the disc.

CRAO manifests as sudden painless loss of vision. Embolic material may originate from atheroma or cardiac valves or may be formed by in situ thrombosis in vasculitis or hypercoagulable states [7]. Ophthalmoscopy also reveals retinal fading and the cherry-red spot. Because of the different therapeutic management approaches, it is vital to establish the aetiology for both disease entities quickly [6].

Case report

A 58-year-old woman with a history of hypertension, nicotinism and rheumatoid arthritis (RA) reported to the Emergency Department (ED) of the County Hospital [where?] on 7 September due to sudden vision loss in the left eye. The history revealed sudden painless blindness in the left eye from the afternoon of the previous day. Initially, spots appeared in front of the left eye, but after a while, there was no light vision. Moreover, headache, fever, temporomandibular joint pain when eating, sore throat, and earache had been present for several days. The patient had no angina pectoris complaints. Laboratory and imaging investigations were performed in the ED, which revealed high inflammatory markers [C-reactive protein (CRP) — 241.5 mg/L, N ≤ 5.0 mg/L] and elevated high sensitivity troponin I

(hs troponin I—8472.9 ng/L, N ≤ 15.6 ng/L). The patient had an ophthalmological consultation. AION and CRAO of the left eye were diagnosed, and a three-mirror massage of the left eye was performed. The flow in the retinal vessels was not restored. A computed tomography (CT) scan of the central nervous system (CNS) and CT angiography (CTA) of the carotid arteries and head were performed in the ED, revealing thick contents in the anterior tympanic cavity, with no significant abnormalities in the head and neck arteries. An electrocardiogram (ECG) showed no features of acute myocardial ischaemia. Due to elevated troponin values, the patient was referred to the Cardiology Department of the County Hospital, where a diagnosis of type 2 myocardial infarction was made. From 8 September, a methylprednisolone dose of 1 g for five days was included, followed by prednisone at 50 mg/day.

At 7.00 a.m. on 8 September, the patient experienced a sudden vision deterioration in the right eye. On 11 September, an ultrasound (US) of the temporal, carotid, facial, subclavian and axillary arteries was performed. It revealed a minor bilateral swelling of the walls of the frontal branches of the temporal arteries. No inflammatory lesions were visible in the other vessels, and the examiner recommended a biopsy of the temporal arteries due to the low severity of the lesions.

During hospitalisation, due to features of circulatory failure, an echocardiogram (ECHO) was performed, which showed a decrease in ejection fraction (EF) to 35–40% with segmental contractile dysfunction.

Additionally, a gradual decrease in troponins, a transient decrease in CRP and an increase in creatinine (64 -> 122 umol/l on 15–19 September) were observed. Due to high inflammatory markers, ceftriaxone was started on 8 September, but the focus of infection was not identified.

On 19 September, the patient was transferred to the Department of Rheumatology and Immunology for continuation of treatment. The ECG on admission showed positive-negative T waves in leads II, aVF, V3–V4, and negative T waves in leads V5–V6. The ECHO showed hypokinesis of the mid and apical segments of the lateral, anterior and posterior wall; EF was approximately 50%. In view of stable troponins and the absence of angina pectoris complaints, the patient was not qualified for urgent coronary angiography.

Laboratory tests showed elevated inflammatory markers, microscopic haematuria with predominantly leached erythrocytes, proteinuria of 0.6 g/day in the daily urine collection, and a further increase in creatinine levels.

Contrast CT scans of the chest, abdomen, and pelvis and CTA scans of the aorta were performed. These did not show features of large-vessel vasculitis but showed multiple round shadows in both lungs, some with cavitation and enlargement of the mediastinal and right hilar lymph nodes. Bronchofiberoscopy was performed with bronchial lavage (no pathogenic agent was isolated); on examination, the mucosa was congested, with numerous erosions and bleeding. On cytological examination of biopsies of lymph nodes of stations 7 and 4R, the picture was consistent with tuberculosis-like granuloma.

On 25 September, a renal biopsy was performed — the specimen was unrepresentative, primarily consistent with extracapillary glomerulonephritis. Sinus CT and ENT examination showed no sinus or temporal bone involvement.

Immunological tests showed the presence of anti-proteinase 3 (anti-PR3) antibodies.

A diagnosis of PR3-ANCA-positive granulomatosis with polyangiitis with involvement of the lungs, kidneys and retinal vessels of both eyes and suspected cardiovascular involvement was made.

Magnetic resonance imaging (MRI) of the heart (26 September) showed preserved left ventricular systolic function (EF 65%), without segmental contractile dysfunction, no evidence of active myocarditis, and the presence of small intramuscular areas of delayed contrast enhancement in the interventricular septum, in agreement with the clinical picture, which may be consistent with a history of myocarditis. No significant arrhythmias were found by Holter monitoring. On 27 September, the patient was noted to have dysarthria and lateral nystagmus on neurological examination. A CNS CT scan with CTA of the head and neck was performed, but no significant pathology was found. Two days later, a CNS magnetic resonance angiography (MRA) scan was performed, which found a left middle cerebral artery ischaemic stroke. In the following days, lateral nystagmus and dysarthria became less severe, followed by the resolution of symptoms.

Before treatment, the patient consented to participate in the clinical trial. As part of the remission-inducing treatment, the patient received 500 mg pulses of methylprednisolone for

three days, followed by two doses of cyclophosphamide of 15 mg/kg at an interval of two weeks, followed by three doses of rituximab of 500 mg at an interval of two weeks. After three months, the treatment improved renal function; proteinuria remained low and stable at 0.8 g/day. Despite treatment, the patient developed permanent blindness of the left eye, with visual disturbances in the right eye after three months, according to the patient's account (no records of ophthalmological follow-up).

Discussion

The above case presents a rare ocular manifestation of GPA — AION and CRAO, which has been reported only in a few case reports [4, 5, 8, 9].

A history of large joint pain for two years, treated with methotrexate with improvement in the past, in the context of the coexistence of another pathophysiologically unrelated autoimmune disease, raises doubts about the certainty of the diagnosis of RA. During the patient's hospital stay, there was no arthritis, and tests confirmed the presence of rheumatoid factor (RF) and no anti-cyclic citrullinated peptide (aCCP) autoantibodies.

The simultaneous occurrence of AION and CRAO, general symptoms and elevated inflammatory markers strongly suggested vasculitis as the aetiology of the visual disturbances [6].

GCA with probable coronary involvement was suspected during the patient's initial diagnosis. On the one hand, the low severity of inflammatory lesions on temporal artery ultrasound raised doubts about the diagnosis of GCA; on the other hand, it could be due to the four-day use of high doses of glucocorticoids, which reduced the sensitivity of the study [10]. After further diagnostic work-up, a confident diagnosis of GPA was made based on the presence of anti-PR3 and typical lung, lymph node, and renal lesions. GCA is the most commonly cited cause of AAION, almost identified with it in many studies, with other types of vasculitis omitted from the differential diagnosis [6]. In the reported case, vision could not be restored in the left eye despite treatment. Late presentation to the ED, delayed initiation of glucocorticoids, and coexisting CRAO may have contributed to the poorer treatment outcome. Visual improvement as a result of AAION treatment is reported in only about 26% of cases [6, 11].

The patient was diagnosed with a type 2 myocardial infarction concomitantly with AION, which raises the question of the aetiology of the cardiac damage. Unfortunately, the patient did not undergo coronary angiography or cardiac MRI at baseline, but an MRI performed more than three weeks later showed changes consistent with a history of myocarditis, so a history of myocarditis in the course of GPA cannot be ruled out.

Approximately three weeks after the first symptoms, despite antiplatelet treatment with acetylsalicylic acid, the patient had an ischaemic stroke. The patient had classic atherosclerotic risk factors for stroke; moreover, patients with GPA have a cardiovascular risk that is four times higher than in the general population [12].

Conclusions

In conclusion, GPA is a disease with a wide range of clinical manifestations, often challenging to diagnose, and can involve the eyes and vital organs. It is worth considering in the differential diagnosis of sudden vision loss. The diagnosis and treatment of GPA require multidisciplinary collaboration. The increased cardiovascular risk in patients with vasculitis should be kept in mind.

Authors' contribution

A.K.: writing—original draft preparation, M.K., W.J.: writing—review and supervision

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Conflict of interest

The authors declare no conflict of interest.

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