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Case Report

# Recurrence of Multiple Myeloma Detected by Fundoscopy – Case Report

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## Abstract

This paper presents a case of recurring multiple myeloma (MM) initially recognized through retinal findings. Its signs are characterized through retinography, fluorescein angiography (FA) and optical coherence tomography (OCT). A 77-year-old female patient with progressive and sudden scotomas, a history of MM chemotherapy, 20/30 acuity in both eyes and mild cataract, had multiple, progressive and bilateral cotton-wool spots. FA enables identification of capillary non-perfusion areas. Using OCT these areas are found to be thickened and have accentuated structural disorganization (nerve fibre layers and ganglion cells). Considering that some ocular findings are frequent over the course of this disease, ophthalmic examination including indirect binocular ophthalmoscopy can assist detection of recurrence.

***Keywords:*** *Multiple Myeloma, Fluorescein Angiography*

## Introduction

MM-associated ophthalmological repercussions are uncommon, especially as the initial form in which the disease appears. Their manifestations are quite varied and include peripheral paresis of the cranial nerves, proptosis, swollen eyelids, episcleritis or scleritis, corneal and conjunctival crystalline and non-crystalline deposits, uveal effusion, ciliary body cysts, uveal plasmacytoma, retinal vasculitis, sensory macular detachment, infiltration of the optic nerve and hyperviscosity-related retinopathy (arterial, capillary and venous occlusions) [1-10].

The majority of series or cases reported as having ocular alterations have been diagnosed during the course of treatment. These alterations are important not only because of local morbidity, but also because of the possibility of their indicating recurrences or acting as a reservoir of malignant cells. The earlier detection occurs, the more effective case management can be [1-10].

Ophthalmic signs indicating early recurrence are not common, nor is analysis using different imaging resources. For this reason, we are presenting a case of recurring MM first recognized through the existence of progressive spots of capillary ischaemia.

### Case Report

A 77-year-old female patient sought emergency eye care complaining of scotomas in her left eye starting three days earlier. The patient had MM (IgG) which had been diagnosed 6 months earlier following spontaneous bone fractures, accentuated fatigue and repeated infections. She was not receiving systemic treatment at the time of the ophthalmic appraisal. She had been treated previously with Cyclophosphamide and Dexamethasone. She did not have diabetes mellitus or systemic arterial hypertension. Serum protein electrophoresis and serum and urine immunofixation were normal in the last clinical review that was made 35 days ago. Corrected visual acuity was 20/30 in both eyes and applanation tonometry was 14 mm in both eyes. Bilateral moderate nuclear cataract. The first indirect binocular ophthalmoscopy (IBO) examination found cotton-wool spots of different dimensions smaller than the optic disc in the left eye only. Four days later the scotomas increased and became bilateral. FA enabled the identification of a large number of capillary non-perfusion areas, with preserved discs and maculae, without signs of leakage or vascular staining. OCT showed that the neurosensorial structure of these spots

was highly disorganized, with absence of limitation between the nerve fibre layer and the ganglionic layer, as well as localized increase in thickness. Bortezomib was introduced and after three months no further ischaemic spots had appeared, acuity remained preserved and sequelae could only be seen using OCT (Figure 1 and 2).

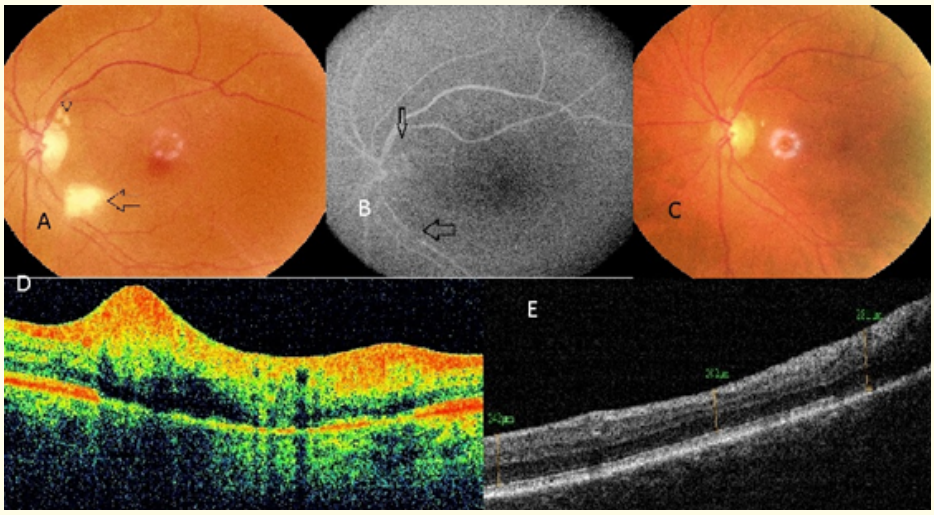


***Figure 1:*** *Images of the left eye. (A) Color photograph show areas of cotton-wool spots (arrows) in peripapillary region; (B) Fluorescein angiography with the non-perfusion zones; (C) Color photograph after three months, with complete resolution; (D)Spectral domain optical coherence tomography (SD-OCT) cuts through the major cotton-wool show localized increase in thickness and disorganization of neurosensorial retina; (E) After 3 months, the SD-OCT shows almost complete recovery of the same zone.*

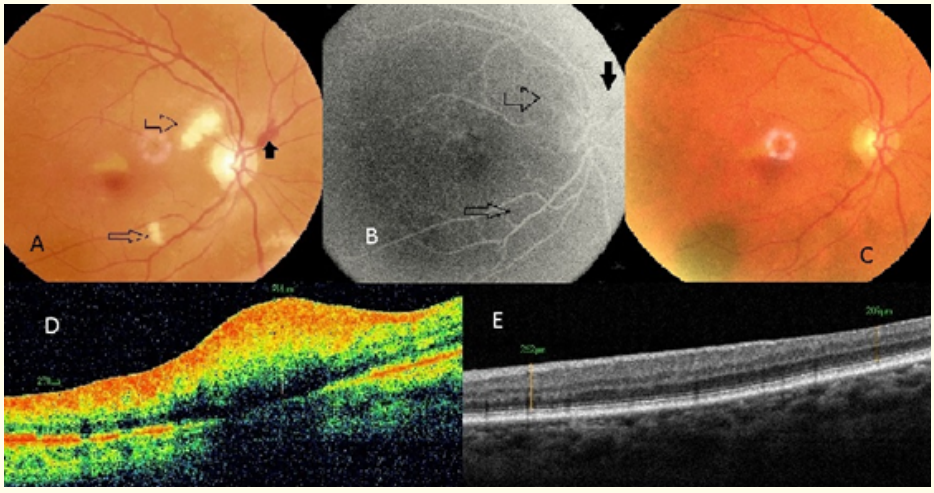


***Figure 2:*** *Images of the right eye. (A) Color photograph show areas of cotton-wool spots (white arrows) in peripapillary region and small flame haemorrhage (black arrow); (B) Fluorescein angiography with the non-perfusion zones (white arrows) and the blocked fluorescence (black arrow); (C) Color photograph after three months, with complete resolution; (D)Spectral domain optical coherence tomography (SD-OCT) cuts through the major cotton-wool show the same modifications in thickness and retina architecture; (E) After 3 months, the SD-OCT shows almost complete recovery of the same zone.*

## Discussion

The annual MM incidence rate is 4 in every 100,000 individuals and has been increasing in recent decades, probably owing to improved diagnosis techniques as well as the increase in the average age of the general population. The disease accounts for 1% of all forms of cancer and is slightly more frequent in male patients. Incidence varies when examining ethnic groups: incidence is 2 to 3 times greater among Black people than among White people [3,11-14].

MM is considered to be incurable, although progress with available treatment has enabled an increase in average patient survival time of up to 10 years whilst maintaining their quality of life [11-14]. The aim of case management is to achieve remission of the disease for the longest possible length of time. Treatment depends on the patient's clinical profile. Older or more clinically fragile patients are treated using chemotherapy-based regimes (Bortezomib, Melphalan or Cyclophosphamide) together with corticosteroids and immunomodulating agents (Thalidomide and Lenalidomide). Younger patients with better clinical performance undergo high-dose chemotherapy followed by autologous bone marrow transplant [11-14].

It is important to highlight that however sensitive examinations may be, the criteria for full response to treatment still leave room for possible minimal residual disease. As such, an integral response to treatment does not mean that cure has been achieved, whilst detection of residual disease worsens prognosis. Even with adequate follow-up together with routine examinations, only a small proportion of patients with MM are able to control the disease in the long term (equivalent to more than 10 years of remission) [11-14].

Some ophthalmic signs are frequent, but are diagnosed using anatomical pathology - such as ciliary body cysts (33 - 50%) - and are without clinical relevance [15] The majority of symptomatic cases are neuro-ophthalmological or orbital [1-5]. Retinal capillary non-perfusion and disorganized structure areas and sensory retina thickening shown by fluorescein angiography and OCT indicate hyperviscosity-associated ischaemia. These findings, together with venular and arterial occlusion and serous macular detachment, form a spectrum of ophthalmoscopic manifestations [6-10].

In the case reported here, isolated fundus alterations were detected in the interval between the scheduled evaluation, in the absence of systemic symptoms of the disease. Depending on the capillary network involved, in addition to serving as clinical warnings, these alterations may compromise vision functionality, thus highlighting the importance of including ophthalmoscopy examinations and current laboratory techniques as part of routine chronic follow-up of patients with multiple myeloma.

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