CASE REPORT

Multiple myeloma masquerading as diabetic macular oedema

Kavitha Rao,¹ Hemanth Murthy,¹ NS Muralidhar,¹ Padmaja Kumari Rani²

¹Department of Vitreoretina,
Retina Institute of Karnataka,
Bengaluru, India

²LV Prasad Eye Institute,
Hyderabad, India

Correspondence to
Padmaja Kumari Rani,
rpk111@gmail.com

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SUMMARY

A 58-year-old man, a known diabetic and hypertensive for 5 years was presented to us with a drop in reading vision in both eyes of 2 months duration. His best-corrected visual acuity was 6/24, N36 in both eyes. Fundus findings revealed moderate non-proliferative diabetic retinopathy with bilateral diffuse macular oedema. When conventional therapy with intravitreal ranibizumab did not alter the clinical picture, we looked into the differential diagnosis of bilateral persistent macular detachments and investigated further. Haematological tests revealed severe anaemia with pancytopenia, which prompted further investigations including a bone marrow biopsy confirming a diagnosis of multiple myeloma. Chemotherapy gradually caused resolution of the macular detachments at 8 months follow-up. This report illustrates that a high index of suspicion regarding systemic condition is required in certain cases presenting as diabetic macular oedema, but not responding to the conventional treatment.

BACKGROUND

Diabetic macular oedema is a very common clinical entity and it is very easy to mistake all macular oedema presenting in people with diabetes as diabetic macular oedema. A high degree of suspicion should be present when diabetic macular oedema did not show the expected response to the conventional therapy.

CASE PRESENTATION

A 58-year-old man presented with history of drop in reading vision in both eyes of 2 months duration. He was a known diabetic and hypertensive since 5 years on treatment. On examination, he was a high hypermetrope with a best-corrected visual acuity of 6/24 in both eyes with +7.00 spherical and +1.50

Figure 2 Baseline fundus fluorescein angiogram showing the absence of capillary leakage around Foveal avascular zone (FAZ) with background diabetic retinopathy changes seen in both eyes.

cylindrical (10° in the right eye and 170° degrees in the left eye) and N36 vision with near correction. Anterior segment examination was unremarkable with normal intraocular pressures in both eyes. Fundus examination of both eyes revealed multiple intraretinal haemorrhages, microaneurysms and soft exudates with severe diffuse oedema involving the macula (figure 1). Baseline fundus fluorescein angiogram (FFA) showed normal AV transit time (17 s), the presence of moderate retinopathy and the absence of leakage (silent Foveal Avascular Zone (FAZ) in both eyes (figure 2). A clinical diagnosis of moderate non-proliferative diabetic retinopathy with severe diabetic macular oedema was made. Optical coherence tomography (OCT) showed bilateral serous detachments of the macula (figure 3). He had history of receiving one intravitreal injection (details of drug not available) in each eye elsewhere. A working diagnosis of severe diabetic macular oedema was made and patient received two consecutive intravitreal injections of ranibizumab 0.5 mg in 0.05 mL to each eye at monthly intervals. Since response was poor and macular detachments remained the same (figure 4), we decided to explore other causes of bilateral macular detachments.

Figure 1 Fundus of both eyes showing multiple intraretinal haemorrhages, microaneurysms and soft exudates with severe diffuse oedema involving the macula.

Figure 3 Baseline optical coherence tomography showed bilateral serous detachments of the macula.

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Figure 4 Follow-up optical coherence tomography after two injections of antivascular endothelial growth factor therapy showing persistent macular oedema in both eyes.

INVESTIGATIONS

He was on systemic medications: metformin 2g and glyburide 5 mg daily. No alteration of medication was done during the treatment. His blood pressure was 130/80 mm Hg, renal function tests included blood urea: 30 mg/dL, serum creatinine: 1.0 mg/dL and glycated haemoglobin (HbA1C) was 7.6 g%.

Haematological investigations revealed that his blood counts were grossly subnormal. WCC 3400/microliter (normal range 4000–11/microliter 000) and haemoglobin 6.7 g/dL. Peripheral blood smear showed gross pancytopenia. We referred him to a haematologist who investigated further and found total protein to be 8.8 g/dL (normal, 6.4–8.3). Bone marrow biopsy showed total plasma cells of 14% (0%–3.5%) and M spike in the beta region in protein electrophoresis. A diagnosis of multiple myeloma (IgA kappa) was made.

TREATMENT

Thirteen cycles of chemotherapy with cyclophosphamide, thalidomide and dexamethasone were given after the systemic diagnosis of multiple myeloma.

OUTCOME AND FOLLOW-UP

Haemoglobin gradually improved to 10.5 g/dL from baseline 1 g/dL. His vision continued to be 6/24 in both eyes. Clinical examination and OCT ([figure 5](#)) revealed near complete resolution of macular fluid in right eye and complete resolution of fluid in the left eye. On follow-up at 8 months, we noticed a rapid progression of diabetic retinopathy with pre retinal haemorrhage in the left eye temporal fundus ([figure 6](#)). New vessels were noted in the left eye. FFA showed the absence of diffuse leakage around FAZ, extensive capillary dropout and new vessels on disc and elsewhere in the left eye and early new vessels on the disc in the right eye ([figure 7](#)). He subsequently underwent pan retinal laser photocoagulation in both eyes.

Figure 5 Optical coherence tomography revealed near complete resolution of macular fluid in right eye and complete resolution of fluid in the left eye.

Figure 6 Left eye fundus photo shows a preretinal haemorrhage with rapid progression to proliferative diabetic retinopathy from baseline.

DISCUSSION

Multiple myeloma is a B cell malignancy with a monoclonal expansion of abnormal plasma cells in the bone marrow that produce excess immunoglobulin. Clinical manifestations occur secondary to the excess M protein, resulting in renal failure, systemic amyloidosis or recurrent bacterial infection due to decrease in polyclonal immunoglobulins or due to excess plasma cell proliferation resulting in lytic bone lesions, osteoporosis, bone fractures, anaemia and extramedullary plasmacytomas.¹

Presumably, the high levels of abnormal serum proteins in these patients may gain entrance into the subretinal space and cause the accumulation of water by osmosis.² In patients who also have diabetic retinopathy, this additional mechanism for the serous detachment may be overlooked for diabetic vascular leakage. Other manifestations of hyperviscosity and secondary anaemia in these patients include retinal haemorrhages, microaneurysms, venous dilation and tortuosity and small-vessel occlusions.^{1–11} Fluorescein angiography without fluorescein leakage around FAZ is seen typically in multiple myeloma and monoclonal immunoglobulinopathies such as Waldenstrom macroglobulinaemia.¹² Bilateral macular detachments, prominent middle limiting membrane on OCT as a presenting sign of multiple myeloma has been reported.^{13–15} Bilateral vitelliform deposits with possible accumulation of immunoglobulins in a patient with multiple myeloma has been reported.¹⁶

Our case presented with all typical presenting features of maculopathy observed in a patient with multiple myeloma. However, due to the presence of background diabetic retinopathy in a patient with known diabetes and hypertension, the macular detachments were mistaken to be due to diabetic macular oedema and treated accordingly. Rapid progression of diabetic retinopathy following bone marrow transplantation in a known case of multiple myeloma in a

Figure 7 Fundus fluorescein angiogram shows the absence of diffuse leakage around FAZ, extensive capillary dropout and new vessels on disc and elsewhere in the left eye.

newly diagnosed diabetic has been reported.¹⁷ Our case also showed similar rapid progression of diabetic retinopathy with proliferative changes in the follow-up period of 8 months only. However, our case dilemma of refractory/wrong diagnosis of diabetic macular oedema with underlying diagnosis of multiple myeloma in a patient with diabetes mellitus has not been reported. Above case illustrates that a high degree of suspicion should be entertained when unusual presentations are seen with diabetic retinopathy and when response to conventional therapy is poor.

Learning points

- ▶ Diabetic macular oedema not responding to conventional treatment should be viewed with suspicion.
- ▶ Presence of multiple retinal haemorrhages, absence of leakage around foveal avascular zone on fundus fluorescein angiography with significant serous macular detachments should alert the physician about the need to rule out coexistent blood dyscrasia.
- ▶ Simultaneous systemic evaluation while treating macular oedema in people with diabetes is important.

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