# Bilateral Polychromatic Crystalline Keratopathy as the Initial Manifestation of IgG-Lambda Multiple Myeloma

**Dear Editor,**

Multiple myeloma is a subgroup of plasma cell dyscrasias with neoplastic proliferation of plasma cells or their precursors. Crystalline keratopathy is a well-recognised but rare ocular manifestation of multiple myeloma.[1] We present a rare case of IgG-lambda multiple myeloma that manifested as polychromatic crystals in the cornea—a presentation that has not been previously described in this particular subtype (IgG-lambda) of multiple myeloma.

## Case Report

A 40-year-old Malay man presented with blurring of unaided near vision for 3 months. He had hypertension, which was complicated by ischaemic cardiomyopathy, previous right occipital infarct and end-stage renal failure requiring haemodialysis. He had no ocular pain, redness, glare or photophobia. He was constitutionally well, with no loss of weight or appetite. His best-corrected distance visual acuity was 20/25 and 20/30 for the right and left eyes, with respective refractive errors of +0.25DS/0.25DC ×180º and +0.25DS/0.75DC ×95º. He was found to have presbyopia that was fully corrected with 2 dioptres of near add, resulting in best-corrected near visual acuity of N5 in each eye.

Anterior segment examination revealed multiple fine dot-like to small speck-like polychromatic crystals in the subepithelial and anterior stromal layers of both corneas (Fig. 1A), sparing the deep stroma and endothelium. The crystals were of various colours such as white, purple, green and blue, and deposited centrally and peripherally (Fig. 1B). The intervening cornea was clear. Bilateral early nuclear sclerotic cataracts were present. Posterior segment examination was unremarkable. The patient declined corneal biopsy for histological examination of the corneal crystals.

The patient was referred to his primary physician for further investigation. Although the possibility of multiple myeloma was communicated to the patient, he felt systemically well and had only just visited his primary physician 2 days prior to his ophthalmology consult. He thus only saw his primary physician 5 months later. At that time, serum uric acid and calcium levels were normal. Serum protein electrophoresis demonstrated a heavy band of monoclonal IgG-lambda in the gamma region, and subsequent serum immunofixation revealed a heavy band of monoclonal IgG-lambda in the gamma region, which prompted a referral to the haematologist. As he was on chronic haemodialysis for end-stage renal failure, he was initially investigated for amyloidosis. The patient was, however, reluctant to undergo further tests and only subsequently underwent a bone marrow aspirate and biopsy

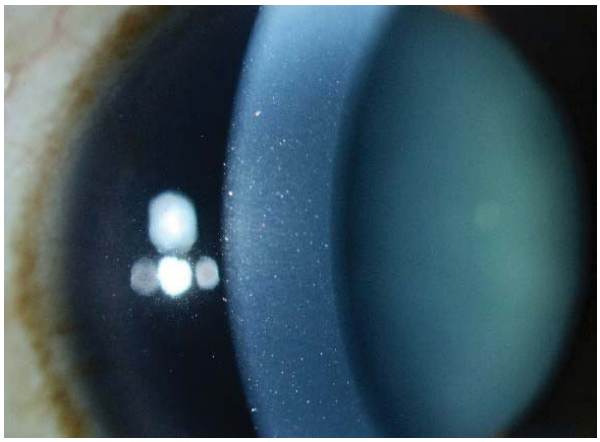

Fig. 1A. Optical section (25×) of cornea showing multiple fine dot-like to small speck-like polychromatic crystals in the subepithelial and anterior stromal layers.

Fig. 1B. High magnification (30×) showing cornea crystals of various colors such as white, purple, green and blue.

when he started to experience profound loss of weight and appetite at about 11 months following his initial ocular presentation. This demonstrated marrow plasmacytosis with abnormal plasma cells, indicative of multiple myeloma. He sought medical treatment from another hospital and passed away 17 months after his initial presentation.

The patient continued to be reviewed in the ophthalmology clinic and was last seen 5 months before he passed away. The crystalline keratopathy had progressed in the right eye, with the presence of more crystalline deposits in the cornea; while that of the left eye remained stable. The visual acuity of each eye remained stable throughout this period.

## Discussion

Crystalline keratopathy is a rare manifestation of multiple myeloma. Various crystalline corneal deposits of immunoprotein have been described, with IgG-kappa chain deposition being most frequently reported.[1]

We have described a rare case of polychromatic crystalline keratopathy due to IgG-lambda myeloma. We are aware of only one other case of crystalline keratopathy in this particular subtype of IgG-lambda myeloma.[2] However, the corneal deposits in this patient were not polychromatic, but consisted of numerous needle-like golden crystals in the epithelium and anterior third of both corneas.

Other forms of myeloma and Hodgkin's disease can also present with polychromatic corneal crystals. A patient with IgG-kappa monoclonal gammopathy that eventually progressed to IgA-kappa myeloma, initially manifested small dot-like opacities that changed to polychromatic crystals when the patient developed multiple myeloma.[3] Another patient who initially had white crystalline deposits that became polychromatic developed IgA-kappa myeloma subsequently.[4] Barr[5] reported 2 patients with multiple fine polychromatic corneal crystals who were subsequently found to have Hodgkin's disease and IgG-kappa myeloma. When hereditary (e.g. cystinosis, corneal dystrophies) and drug-induced causes of corneal crystals have been excluded, acquired crystalline keratopathy of a polychromatic nature seems to herald a more aggressive lymphoproliferative disorder (multiple myeloma, Hodgkin's disease) than a more benign condition such as monoclonal gammopathy; and warrants prompt haematological investigation, even when the patient is systemically well.

## Conclusion

Although rare, corneal crystals may be the initial presentation and earliest sign of multiple myeloma. We have presented a unique case of polychromatic crystalline keratopathy in IgG-lambda multiple myeloma. When hereditary and drug-related causes have been excluded, corneal crystals of a polychromatic nature necessitates prompt haematological workup for an underlying lymphoproliferative disorder.

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