

# Azurophilic inclusions in plasma cells

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## ABSTRACT

We report a 45-year-old man with complaints of chest pain and weight loss who was referred for a bone marrow/trephine procedure to the Aga Khan University Hospital. Bone marrow examination showed plasmacytosis of 95% with plasma cells containing coarse Auer rod-like azurophilic inclusions, which failed to stain positively with Sudan Black B or periodic acid Schiff stain. These inclusions have rarely been previously reported as they are more significant morphologically rather than having a prognostic value.

**Keywords:** azurophilic granules, multiple myeloma, plasma cells

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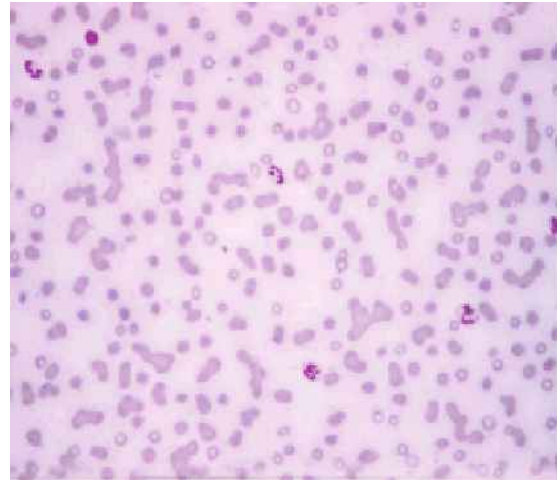
## INTRODUCTION

Several cases of Auer rod-like inclusions in cells of multiple myeloma have been published previously.<sup>(1)</sup> Other associations include polymorphous leukaemia and hypogammaglobulinaemia.<sup>(2)</sup> On special stain profile, these granules are negative for Sudan Black B stain and show occasional positivity for periodic acid Schiff (PAS) stain. We describe a patient with multiple myeloma showing azurophilic granules in plasma cells.

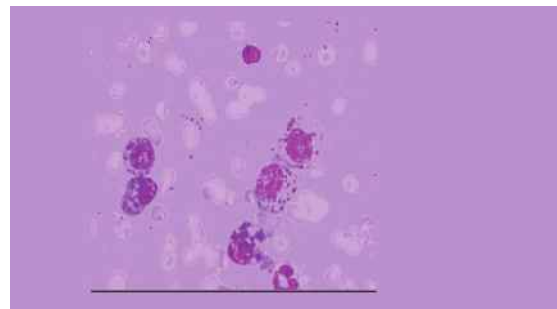
## CASE REPORT

A 45-year-old man was referred to the clinical laboratory of The Aga Khan University Hospital, Pakistan, for bone marrow examination due to persistent chest pain and weight loss for the last four months. His past history was insignificant except for a blood transfusion two weeks ago. He had no previous history of hospitalisation. A provisional diagnosis of secondary deposits was made clinically and bone marrow examination was performed for proper evaluation. His complete blood count showed a haemoglobin level of 6.5 g/dL, haematocrit 20.6, mean corpuscular volume 78.5 fL, mean corpuscular haemoglobin 25 pg, white blood cells  $6.8 \times 10^9/L$  and platelets  $237 \times 10^9/L$ . A peripheral smear revealed a dimorphic blood picture, with target cells and gross rouleaux formation (Fig. 1).

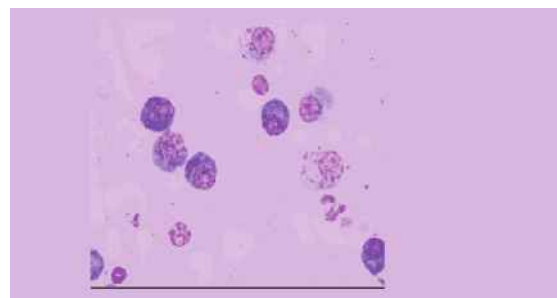
Bone marrow aspirate was hypercellular, with diffuse infiltration of plasma cells comprising 95% of the total nucleated cell population. The abnormal plasma cells ranged from 20  $\mu\text{m}$  to 30  $\mu\text{m}$  in size with an oval



**Fig. 1** Peripheral blood film shows gross rouleaux formation (Leishmann stain,  $\times 40$ ).



**Fig. 2** Bone marrow aspirate shows plasma cells with coarse azurophilic granules (Leishmann stain,  $\times 100$ ).



**Fig. 3** Bone marrow aspirate shows pleomorphic plasma cells with flaming cytoplasm and azurophilic granules (Leishmann stain,  $\times 100$ ).

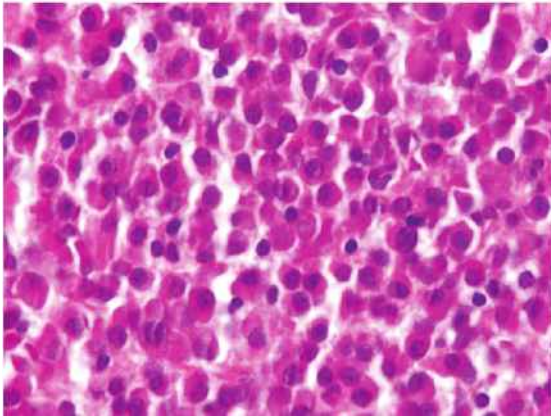
nucleus, fine chromatin and deep basophilic cytoplasm. Approximately 80% of these cells contained coarse azurophilic Auer rod-like inclusions/granules occupying the majority of the cytoplasmic space except the perinuclear area (Figs. 2 & 3). The remainder of these cells showed an eccentrically-placed nucleus, with vacuolated cytoplasm and granules occupying the periphery of the cytoplasm. These cells were negative for Sudan Black B

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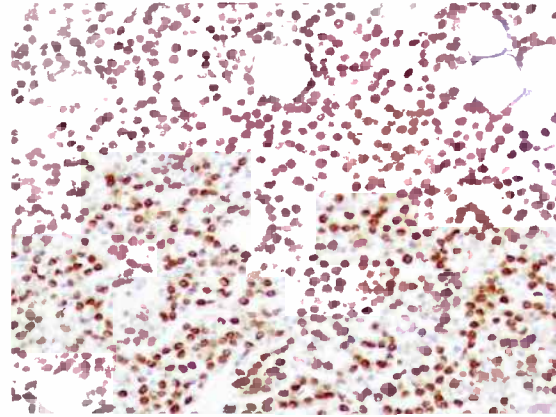
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**Fig. 4** Bone trephine photomicrograph shows plasma cells (Haematoxylin & eosin,  $\times 100$ ).



**Fig. 5** Bone trephine photomicrograph shows positivity for MUM 1 immunostain ( $\times 40$ ).

and PAS stain. Immunohistochemistry showed positivity for MUM 1 (Figs. 4 & 5). The findings were suggestive of multiple myeloma, and further work-up for the disease was advised. A subsequent skeletal survey showed diffuse lytic lesions. His serum protein electrophoresis indicated monoclonal gammopathy, which was later confirmed as IgG Kappa through immunofixation studies.

#### DISCUSSION

Plasma cells containing azurophilic granules have been reported in the past. Usually these granules are negative with cytochemical stains but occasionally may be positive with PAS stain.<sup>(3)</sup> Ultrastructural or electron microscopical studies have shown these inclusions to have a fibrillar or cross-striated pattern.<sup>(4)</sup> These may represent light chains of immunoglobulins which are concentrated within these plasma cells.<sup>(5)</sup> Auer rod-like inclusion is infrequently present in myeloma cells and

has a significant morphological finding.<sup>(6)</sup> Ultrastructural as well as immunofluorescent studies are further required to establish their importance.

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