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IMAGES IN HEMATOLOGY

Gelatinous transformation of bone marrow in a patient with severe anorexia nervosa

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An 18-year-old Caucasian female was referred by her general practitioner for evaluation of chronic anaemia. The patient had been diagnosed with anorexia nervosa 2 years prior to this referral. She appeared emaciated with a weight of 34 kg and a very low body mass index of 12.1 kg/m^2. She was also amenorrhoeic. Full blood count showed moderate pancytopenia with a haemoglobin (Hb) of 74 g/L, absolute reticulocyte count of 60×10^9/L, white blood cell count (WBC) of 1.4×10^9/L, neutrophil count of 0.8×10^9/L, lymphocyte count of 0.4×10^9/L and platelet count of 80×10^9/L. Red cell indices were normal. Blood film showed normocytic, normochromic red blood cells with elevated acanthocytes (Fig. 1). Hypokalaemia and hypomagnesaemia were also noted. Serum iron studies, vitamin B12 and folate levels were all in the normal range. There was no evidence of extra-medullary haematopoiesis on CT scan. Bone marrow aspiration and biopsy were done as work-up for pancytopenia. The aspirate revealed a pale brown gelatinous substance macroscopically. Microscopic visualization with MGG stain showed the bone marrow fragments to be amorphous and purple-coloured, with an absence of fat spaces and very scanty cells inside them and in the trails (Fig. 2). Bone marrow trephine biopsy revealed thinned out bony trabeculae. Marrow was hypocellular and replaced by an amorphous fibrillary substance with total absence of fatty tissue (Fig. 3). There was a marked

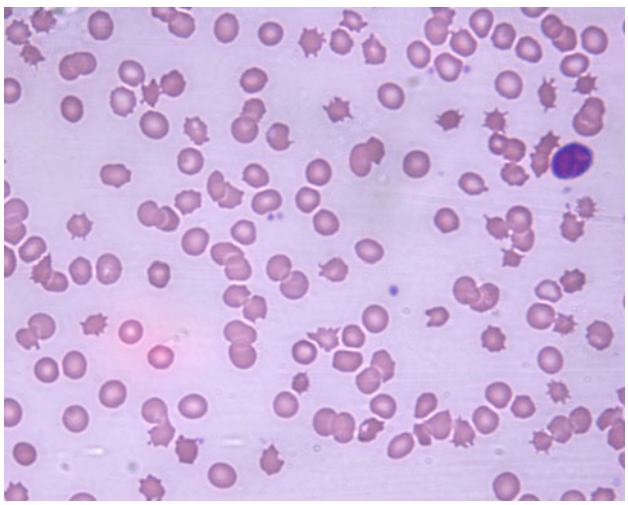

Fig. 1 Blood film

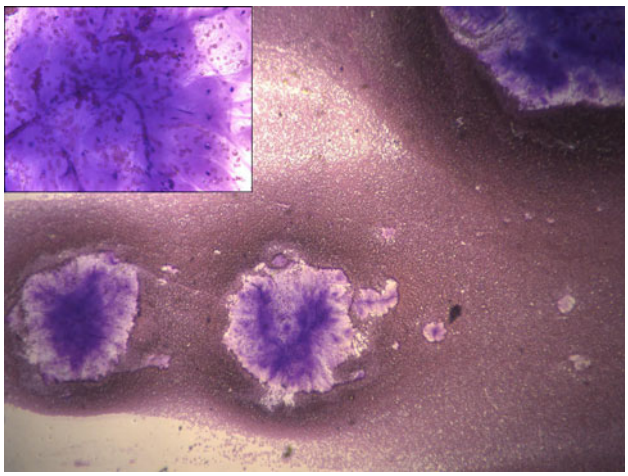

Fig. 2 Bone marrow aspirate

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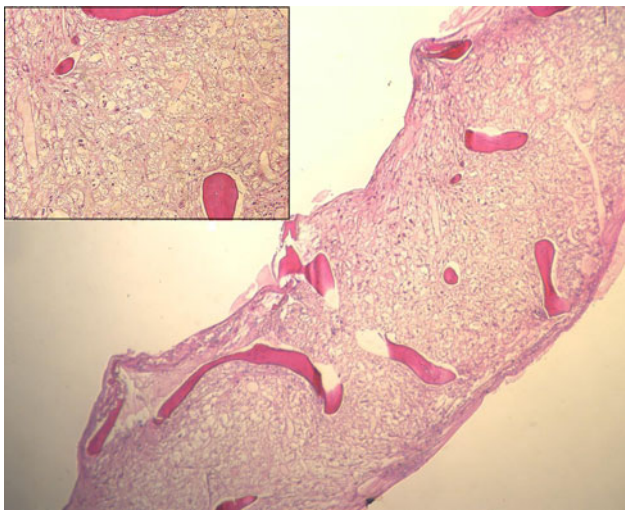

Fig. 3 Bone marrow trephine biopsy

reduction of haematopoietic cells. These features were consistent with gelatinous transformation of bone marrow.

Changes in blood counts, red cell morphology, and bone marrow are reported in patients with anorexia nervosa. Anaemia and mild neutropenia are detectable in almost one-third of these patients, whereas thrombocytopenia occurs in less than 10 % [1]. Acanthocytes can be seen in the peripheral blood film in patients with anorexia nervosa. Although the pathophysiology of this condition remains unclear, changes in plasma lipids or red cell membrane proteins may be involved [2]. The bone marrow changes, showing atrophy of fat cells with the deposition of an amorphous gelatinous material and reduction of haematopoietic cells, have been described as gelatinous transformation or serous atrophy. This presentation is caused by filling of the marrow spaces with hyaluronic acid [2]. Although bone marrow changes are secondary to nutritional deprivation in anorexia nervosa, the exact mechanism underlying these processes is unclear. It has been reported that blood and bone marrow alterations resolve completely and rapidly after sufficient re-feeding [3].

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