

International Journal of Medical Science and Clinical Inventions

Volume 1 issue 9 2014 page no. 489-492 ISSN: 2348-991X

Available Online At: <http://vallevinternational.net/index.php/our-iou/iimsci>

Serous Atrophy Of The Marrow In Anorexia Nervosa – A Case Report

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ABSTRACT: *Anorexia nervosa is a psychiatric disorder characterized by a purposeful dietary restriction and altered alimentary habits, with very few cases having been reported from India. Hematologic manifestations include cytopenias. Bone marrow aspirations usually yield a dry tap probably due to serous degeneration and biopsy usually reveals alterations in bone marrow adipocytes with deposition of pink homogeneous material.*

Serous atrophy of bone marrow is a rare disorder characterized by fat cell atrophy, loss of hematopoietic tissue and deposition of extracellular matrix by mucopolysaccharides. It has been described in a variety of chronic diseases like cancer-related cachexia, anorexia nervosa due to starving, infections, and malignant

neoplasms, including lymphoma. We hereby present a case of 50 year old woman who presented with fatigue and loss of appetite since a year along with bilateral pedal edema and breathlessness

Key words : *Anorexia nervosa, Cytopenias, Cachexia, Serous atrophy*

Introduction

Gelatinous transformation of marrow is replacement of marrow by mucopolysaccharides with loss of hematopoietic elements.¹ Most commonly seen in the adolescent age group in the western world; it is seen in many conditions viz chemotherapy, cancer cachexia, lymphomas, AIDS, endocrinopathies and solid malignancies; anorexia being a rare cause.^{1,2} Clinically, it is

characterised by weight loss and altered bowel habits, bradycardia, hypotension, low serum calcium and potassium.² Hematologically, it is characterised by anaemia and cytopenias depending on degree of involvement of marrow.³ Gelatinous transformation appears as pink material on Romanowsky stain and positive for Alcian blue at specific pH 2.65.⁴

Case details:

A 50 year old female presented to the emergency with a history of loss of appetite, loss of weight, fatigue since one year and pedal oedema for 4 months prior to admission. She also had a history of persistent hypotension and hypoglycaemia. No contact history of tuberculosis was elicited.

On admission, she was drowsy and emaciated with a blood pressure of 90/70 mm Hg. Physical examination revealed pallor, clubbing, icterus and gross ascitis and bilateral pleural effusion. There was no organomegaly or lymphadenopathy.

Since the patient was drowsy, a bedside USG was done which revealed moderate ascitis and B/L pleural effusion. Bedside ECHO showed mild Mitral regurgitation but no other abnormality was noted. Abdominal CT also revealed ascitis, but no organomegaly or abnormality was detected. Hematological investigations revealed pancytopenia with mildly elevated ESR. She had biochemical evidence of hypothyroidism with a reduced T3 and T4 and an elevated TSH. Rest of biochemical parameters were within normal limits. There was also no evidence of any malignancy.

Bone marrow aspiration was a dry tap with pink stained gelatinous material with few of hematopoietic cells ; Fig. (1,2,3). The bone marrow showed a hypocellular marrow with evidence of gelatinous transformation. Of the special stains performed; Alcianblue(at Ph 2.65) and PAS were positive while Mucicarmine was inconclusive. Fig (4, 5)

Patient developed cardiac arrest and succumbed to death on 3rd day due hyperkalemia.

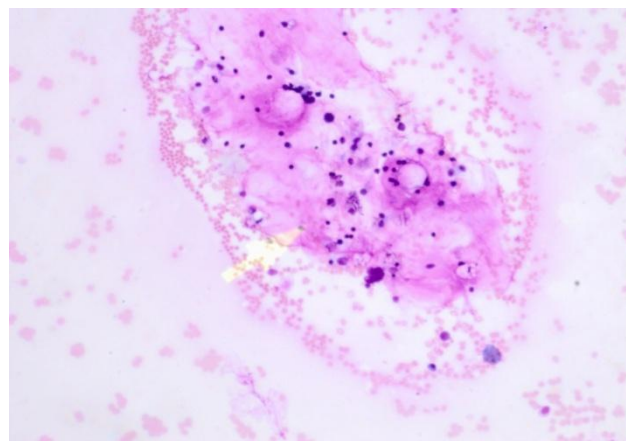


Figure 1 Bone Marrow Aspirate showing deposition of pink gelatinous material. Romanowsky stain 200x.

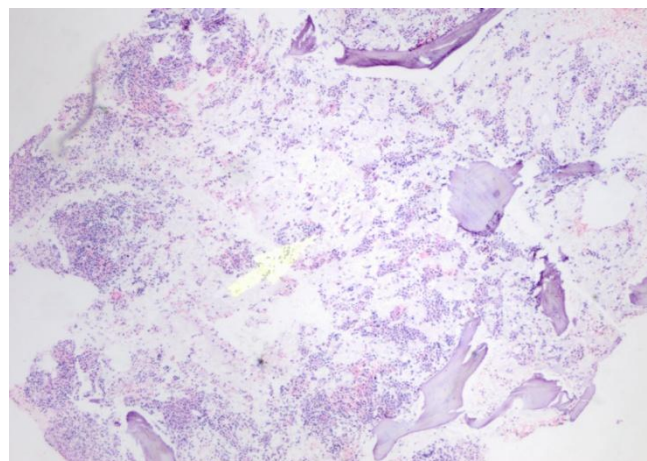


Figure 2 Bone Marrow Biopsy showing pink material with lack of hematopoietic cells. Haematoxylin and Eosin 200x.

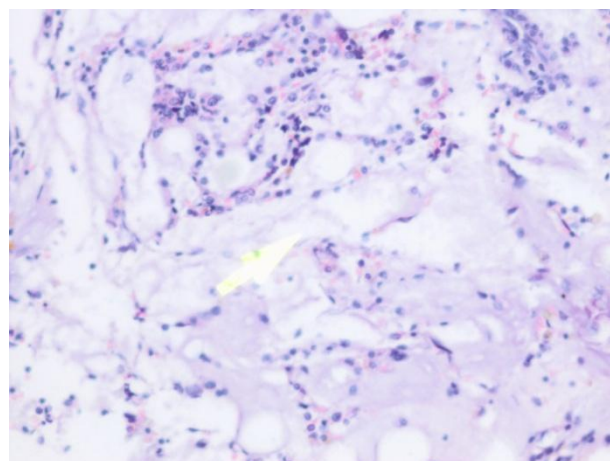


Figure 3 Bone Marrow biopsy showing gelatinous transformation with fat cell atrophy and pinkish areas with loss of hematopoiesis.400x

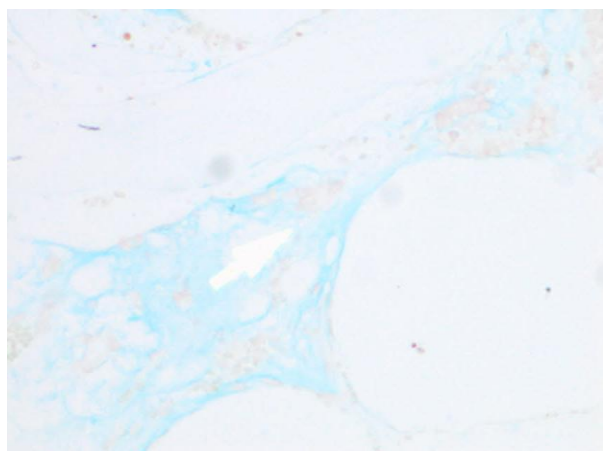


Figure 4 Bone Marrow biopsy showing positive Alcian Blue stain.400x

Discussion:

Gelatinous transformation of bone marrow (GTM), also called serous atrophy, is characterized by replacement of normal hematopoietic elements in the marrow by the deposition of gelatinous mucopolysaccharides (hyaluronic acid).¹ In the largest case series published on GTM till date by Bohm, the most common etiology was Tumors (37.5 %) (Lymphomas and leukemias) followed by malnutrition (16.8%) (alcoholism, anorexia, vegetarianism), infections (11.8%) (AIDS, TB), Heart failure (7%) and Metabolic disorders (5.4%) (Diabetes, Hypothyroidism). Maldigestion (stomach ulcers, cirrhosis) and other conditions such as renal failure, iron deficiency and psychoses constituted the rest.¹ The most consistent findings found with GTM were weight loss and Anemia.²

Though the pathogenesis is not entirely clear, recent studies have attributed the cause of impaired hematogenesis to leptin deficiency and a disturbed balance between fat cells and osteoblasts; which is especially found in chronic malnutrition.^{6,7} Furthermore ; the associated gelatinous transformation of marrow is thought to

be caused by excessive production of mucopolysaccharide of ground substance to compensate for the mobilization of marrow fat which usually occurs in order to meet the energy requirement.^{6,7} Since this is not a fibrotic process; thus it is usually reversible with the re-establishment of adequate nutritional intake.^{2,5}

GTM has rarely been described in association with anorexia nervosa in a middle aged patient. While patients with AN have an increased prevalence of anemia, leukopenia and thrombocytopenia on peripheral blood , bone marrow biopsies of the iliac crest commonly have increased adipocytes.⁴ It is also known that degree of variation in weight and not peripheral blood picture correlate with the extent of bone marrow damage in these patients.³

Based on the clinical heterogeneity of the associated condition, GMT may be an indicator of a severe underlying disorder rather than being a particular disease per se.⁵ One case report of 7 year survival with GTM of idiopathic origin with supportive care and repeated transfusions for every 2 weeks and multivitamin supplements by Charania et al.,⁸ Since the prognosis of GTM depends on the causative factor, careful examination and relevant investigations should be done to find out the underlying exact etiology.

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