Extramedullary hematopoiesis in thyroid gland: A rare case report

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Abstract

Background: Extramedullary hematopoiesis is known to occur mainly in the organs of reticuloendothelial system. It is very rare for EMH to occur in thyroid nodule without any haematological abnormality.

Case: A 71 year healthy male presented with 3 month history of dysphagia to solids. Clinical examination revealed thyroid nodule measuring 1 cm in diameter in right lobe of thyroid gland. FNAC was performed and microscopic examination showed presence of hematopoietic elements of all the three lineages in the background of benign thyroid follicular epithelial cells. We are reporting this case because of it's rarity as, no case of EMH with thyroid nodule causing only dysphagia with no haematological abnormality has ever been reported till date.

Conclusion: EMH can present as thyroid nodule with only complaint of difficulty in swallowing with normal haematological parameters. Identification of giant cells as megakaryocyte helps in diagnosis of EMH.

Keywords: Extramedullary hematopoiesis, FNAC, Hematopoietic elements, Thyroid gland, Thyroid nodule.

Access this article online

Quick Response Code:

Website: www.innovativepublication.com

DOI: 10.5958/2394-6792.2016.00059.4

Introduction

Extramedullary hematopoiesis has been described in almost every organ of the body; mainly in tissues active in hematopoiesis in embryonic life *i.e*., liver, spleen and the lymph nodes.[1] It is very rare for extramedullary hematopoiesis to occur in thyroid gland; especially in patients without any hematologic abnormality like anemia and myelofibrosis. The present case is being reported as there was no history of chronic anemia due to any cause and the patient had an isolated complaint of dysphagia with a nodule in the right lobe of thyroid and the diagnosis of extramedullary hematopoiesis was not even a remote possibility in the mind of the clinician. The rarity of reports of extramedullary hematopoiesis in thyroid also makes it a case worth report.

Case Report

71 years old male presented to ENT OPD, with chief complaint of dysphagia to solids for a period of three months, clinical examination revealed a firm non tender nodule measuring 1 cm in diameter in the right lobe of the thyroid gland. The thyroid profile pointed towards euthyroid status. Contrast-enhanced computed tomography (CECT) of the neck upper chest revealed diffuse thyromegaly with multiple calcified hypodense cystic lesions. The fine needle aspiration cytology (FNAC) was performed using a 21 gauge needle and 20 ml disposable syringe and the smears, air dried and fixed in alcohol, followed by staining with May Grunwald Giemsa (MGG) and Papanicolaou stain respectively.

The FNAC revealed cellular aspirate composed of fragments of adipose tissue and haematopoietic elements of all the three lineages – megakaryocytes, myeloid and erythroid elements in a background of blood and benign thyroid follicular epithelial cells. A diagnosis of focus of extramedullary hematopoiesis was made and the patient underwent a complete haematologic work up, including Haemoglobin estimation, Complete blood count (CBC), Peripheral blood film, Erythrocyte sedimentation rate(ESR), Thyroid function test, Anti TPO, bone marrow aspiration and bone marrow biopsy. Haemoglobin was 11 gm/dl, CBC--- Total leucocyte count 8000/mm^3, Differential leucocyte count– Polymorphs 65 Lymphocyte 30 Eosinophil 2 Monocyte 3, ESR -11 mm/1st hour. The thyroid function test were done. T3 level was 104ng/dl, T4 level was 8.2µg/dl and TSH was 4.1Uu/ml. Anti TPO levels were negative. Both bone marrow smears and biopsy showed normal haematopoiesis for the age of the patient. There was no evidence of myelofibrosis, no splenomegaly. On basis of battery of tests conducted, a final diagnosis of isolated extramedullary hematopoiesis in the thyroid gland was made.

Discussion

Non hepatosplenic extramedullary hematopoiesis is a rare lesion; often associated with myeloid metaplasia, and preferentially affects the thoracic spine region.[2] Thyroid nodule is a common presentation in the clinics. The most common diagnosis of these nodules in FNAC includes nodular goitre, follicular adenoma, papillary carcinoma, benign cysts, haemorrhage, fibrosis and

cystic change may also be seen; however mature bone formation and/or extramedullary hematopoiesis in a thyroid nodule is rarely reported.[3,4,5] Extramedullary hematopoiesis is also known as myeloid metaplasia and is defined as a production of myeloid, erythroid and megakaryocytic elements at ectopic sites.[1] The most common sites of extramedullary hematopoiesis in adults are organs of the mononuclear phagocytic (reticuloendothelial) system that were involved in hematopoiesis during fetal life (*i.e.*, liver, spleen and the lymph nodes).[1,6] The review of literature suggests that non hepatosplenic extramedullary hematopoiesis is rare often associated with myelofibrosis with myeloid metaplasia (MMM).[2] However, extramedullary hematopoiesis can occur at virtually any site in the body.[3,7,8] Prerequisites for the development of focal extramedullary hematopoiesis are presumably the presence of hematopoietic precursors and a suitable environment that includes appropriate neighbouring cells, extracellular matrix and growth factors such as granulocyte-macrophage colony- stimulating factor, other cytokines and/or hormones.[9] In a nodule of thyroid gland, a suitable microenvironment for differentiating pluripotent hematopoietic cells is provided by mesenchymal cells and capillaries.[10]

Diagnosis can be made by FNAC, tissue biopsy or radionuclide bone marrow scanning. Rarely extramedullary hematopoiesis has been reported in nodule in the thyroid gland. The cases reported are mostly of elderly patients and are associated with haematological abnormalities like chronic anemia and myelofibrosis. However in our case, there was no haematological abnormality and the patient was feeling uncomfortable because of the compression effect of the nodule. The main complaint of the patient was difficulty in swallowing for which he presented to the ENT OPD. Since there was no obvious thyromegaly, he was advised CECT neck. It is extremely rare for extramedullary hematopoiesis to occur in thyroid gland especially in patients without known chronic anemia. Moreover, no case has been reported presenting with chief complaint of dysphagia for solids.

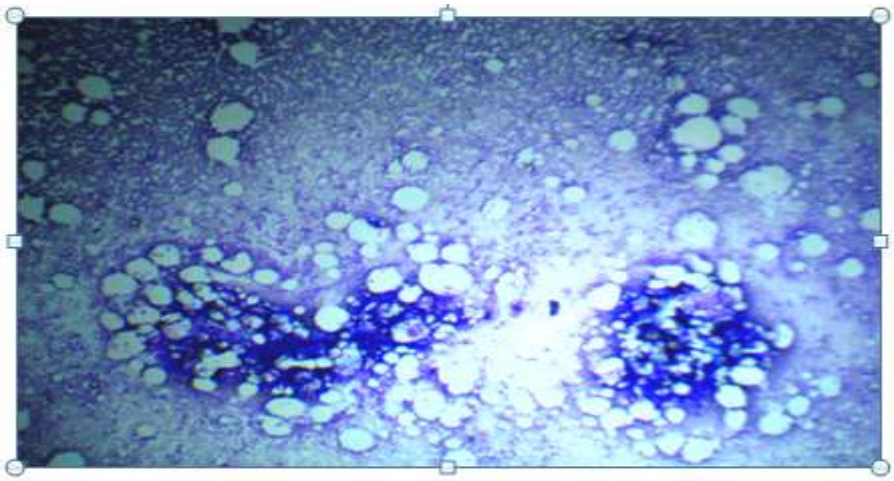

Fig. 1: FNA smear of thyroid nodule showing foci of extramedullary haematopoiesis depicting all the three lineages; MGG, X40

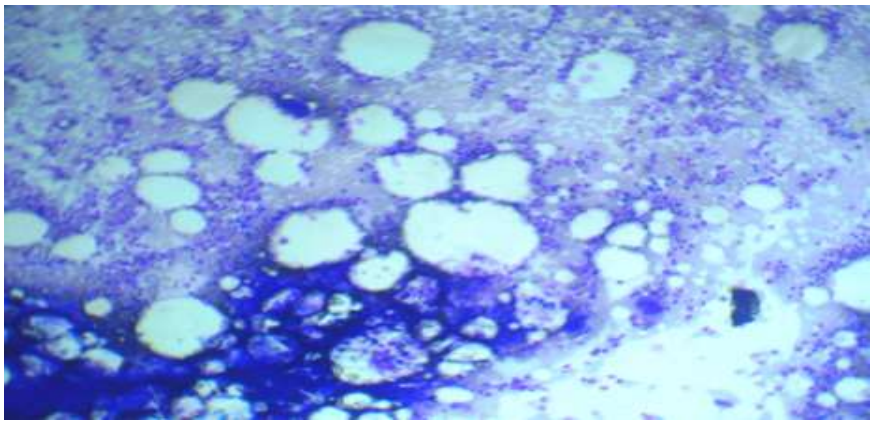

Fig. 2: Low power view; MGG, X 100

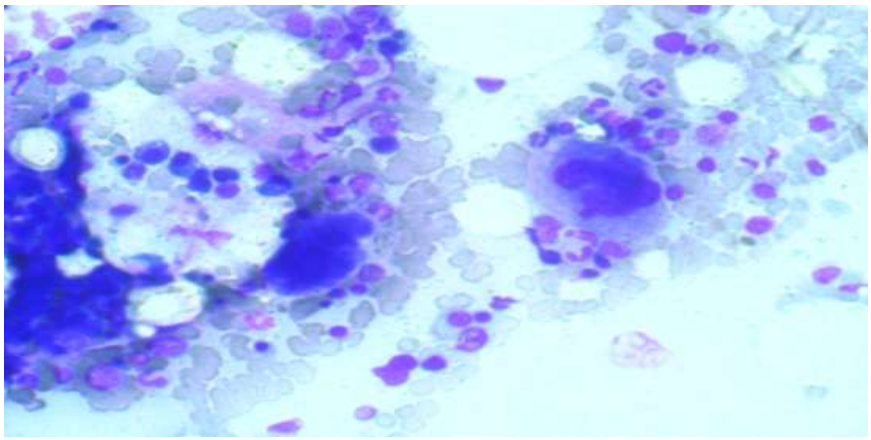

Fig. 3: Megakaryocytes seen in the background of erythroid and myeloid cells; MGG X 400

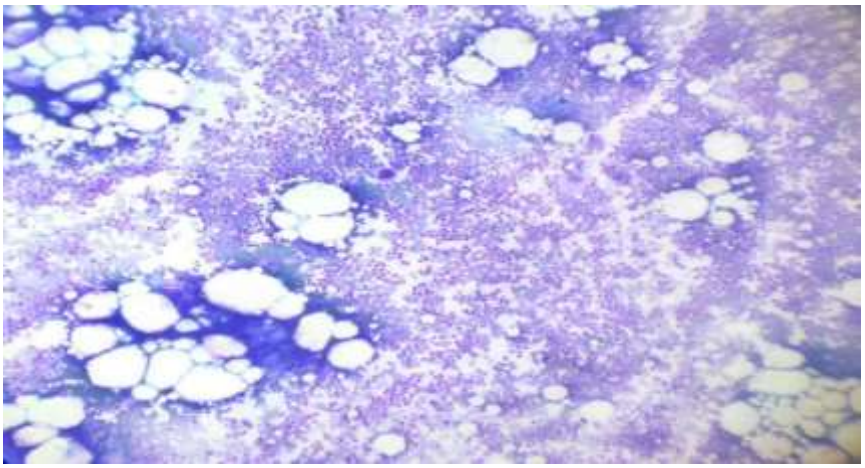

Fig. 4: Bone marrow aspiration showing normocellular marrow for age. Low power view; MGG, X 100

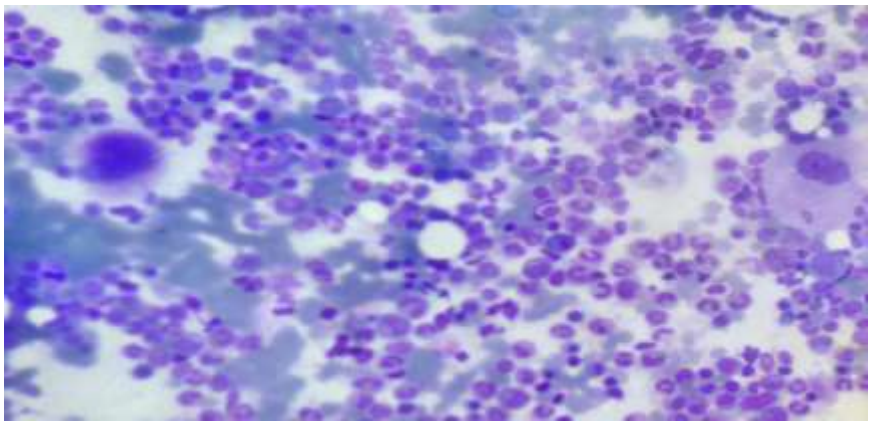

Fig. 5: Bone marrow aspiration. High power view; MGG, X 400

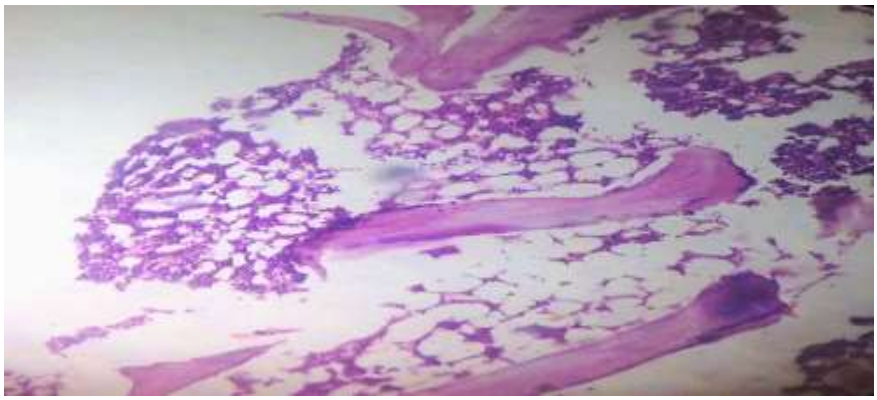

Fig. 6: Trephine biopsy showing normal haematopoiesis. Low power view; H&E, X 100

Summary

The presence of extramedullary hematopoiesis in thyroid is an unusual finding and due to presence of numerous giant cells; the differential diagnosis ranges from infections, inflammatory and drug or radiation induced alteration to malignant neoplasms. The differential diagnosis is based on recognition of giant cells as megakaryocytes.

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