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Case Report

Osteopetrosis in Adults: A case Report

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Abstract
A young female presented with shortness of breath, palor and abdominal distension. Her investigations showed pancytopenia and hepatosplenomegaly. Her skeletal survey and bone marrow biopsy were strongly suggestive of osteopetrosis.
Key words: Osteopetrosis, Hepatosplenomegaly, Pancytopenia

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Introduction

Case description:

A 22 yrs old female presented with complaints of progressive shortness of breath, heavy menstrual bleeding and upper abdominal discomfort. No history of weight loss, recurrent infections, anorexia, bone pains or recurrent fractures were reported. She had no significant family history and her siblings were healthy.On examination she was normotensive, pale and had hepatosplenomegaly. All cranial nerves were intact and no bony deformity was present. Neither lymphadenopathy nor any bony tenderness was appreciated.

Complete blood counts showed hemoglobin 4.6 g/dl, RBC count 2.26x10^6/mcl,TLC count 3.58x10^9/l , platelet count 82x10^9/l. %RDW-CV 21.7, MCH 20.4, MCHC 28.4, MCV 71.7. Reticulocytes count 4.9%, Reticulocyte production index 0.7%. Peripheral smears showed 6 nucleated RBCs/100 WBCs myelocytes 4%, metamyelocytes 2%, neutrophils 51%, lymphocytes 37%, monocytes 4%, eosinophils 2%. RBCs morphology showed microcytosis, hypochromia, anisocytosis and polychromasia.LFTs showed bilirubin 0.9mg/dl, ALT 24 U/L, AST 29 U/L, Alkaline phosphatase 200U/L, Albumin 4.1 G/dl PT 13, APTT 33, serum Sodium 141mg/dl, Potassium 3.8 mg/dl, Calcium 6.4mg/dl, PO4 3.9mg/dl, Urea 18mg/dl, creatinine 0.7 mg/dl. Uric acid levels were 5.0mg/dl, LDH levels 516 U/L, Acid Phosphatase levels 3.9U, PTH levels 22 pg/ml. Her abdominal ultrasound showed a liver size of 16.4cm with normal texture and normal portal vein, spleen was enlarged 18.4 cm in size, kidney, pancreas, gallbladder, and pelvic viscera were normal. No abdominal lymph-adenopathy was seen.

Skeletal survey showed generalized increased bone density throughout the skeleton. There was cortical thickening with medullary encroachment. Long bones were tubular with mild flaring at ends. Within the spine there was sandwich vertebral appearance due to end plate sclerosis. Mandible was not involved and there were no fractures identified.

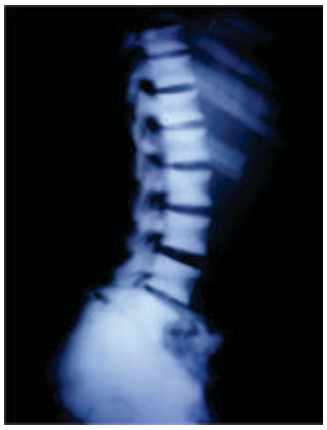

Figure 1: *Rugger Jersey Appearance Showing End Plates Marginal Sclerosis of Vertebral Bodies.*

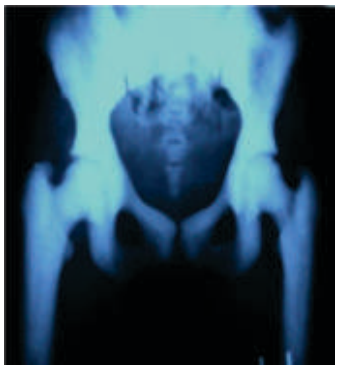

Figure 2: *Generalized Increased Bone Density*

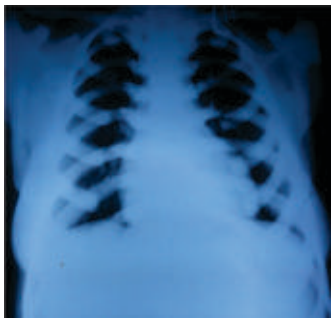

Figure 3: *Increased Bone Density in Ribs*

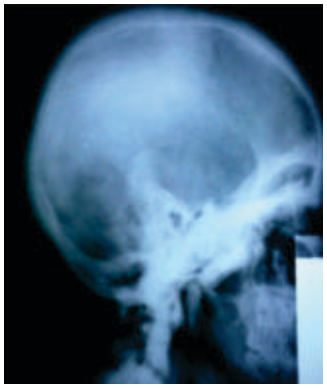

Figure 4: *Sclerosis of the Base of Skull with Diffuse Calvarial Thickening*

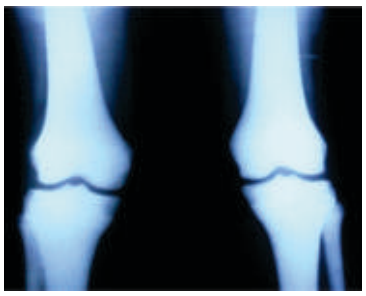

Figure 5: *Tubular Bones with Increased Bone Density with Loss of Corticomedullary Differentiation*

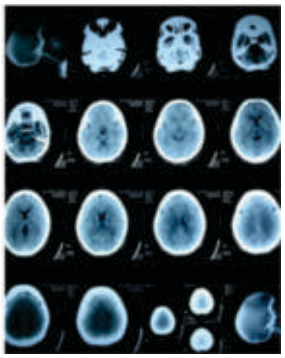

Figure 6: *CT Scan Brain Showing Increased Bone Thickness with no Intracranial calcification.*

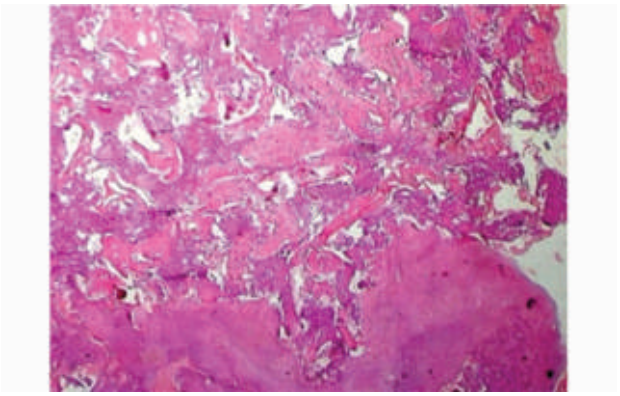

Figure 7: *Bone Marrow Biopsy Showing Thickened Trabeculae, Osteosclerosis with Fibrosed Bone Marrow*

showed reduced cellularity, osteosclerosis, fibrosis and gradual obliteration of marrow cavity favoring osteopetrosis.

Reviewing the whole scenario, we reached the diagnosis of osteopetrosis with an atypical presentation. This case doesn't completely fit the adult variety or intermediate variety of disease. Supportive treatment consisting of blood transfusions, steroid, vitamin D, low calcium diet were given to the patient and was followed on an outpatient department basis.

Discussion

Osteopetrosis is also known as "marble bone disease" and "Albers-Schönberg disease", after the German radiologist who first described this disease.[1] It results due to the inability of osteoclasts to resorb bone leading to impaired bone remodeling. This in turn leads to weakening of the skeleton despite increased bone density, stunted growth, hematopoietic insufficiency and nerve entrapments.[2] It has three clinical forms: (a) Malignant infantile (ARO) form with autosomal recessive inheritance, (b) Benign/Adult osteopetrosis (ADO) with autosomal dominant inheritance, (c) Intermediate autosomal osteopetrosis (IAO) presents with clinical manifestations similar to malignant form.[3] The estimated incidence of autosomal recessive variety is 1 case per 200,000 and 1 case per 20,000 of autosomal dominant variety.[4]

Adult osteopetrosis is diagnosed in late adolescence or adulthood. It has two types, type I and type II.[2] Type I is associated with a low fracture rate. Radiological findings show that sclerosis is more pronounced at the cranial vault with normal acid phosphatase levels. Type II, typically has onset in late childhood or adolescence. Clinical features include spontaneous fractures, scoliosis, hip osteoarthritis and osteomyelitis. Nerve entrapment is a relatively rare feature. Radiological findings reveal diffuse osteosclerosis, vertebral end

plate thickening showing Rugger-Jersy appearance of vertebra, bone in bone appearance and sclerosis of base of skull. In ADO II, acid phosphatase levels are elevated in contrast to type I ADO.[5]

At least 10 genes have been identified which can lead to disease manifestation in humans(3). Increased bone density conditions have been classified by The Nosology Group of the International Skeletal Dysplasia Society into different types which are as follows.[6,7]

- ARO
    a. Classic
    b. Neuropathic
    c. With renal tubular acidosis
- X-linked osteopetrosis
- Intermediate-recessive osteopetrosis

The above reported case has some unique features that are as follows:

1. The patient belongs to the adult age group but had signs of severe bone marrow suppression and extramedullary hematopoiesis. ADO doesn't have significant bone marrow suppression. Patients may be asymptomatic and marrow failure is rare.[2] Most of patients are diagnosed only when osteomyelitis occurs in the mandible. ARO presents with bone marrow suppression.
2. In 75% of the patients, clinical features of type II include hip osteoarthritis, facial nerve palsy, mandibular osteomyelitis and fractures of the long bones.[7] This patient neither had history of fractures nor was fracture found on radiographs.
3. This patient had sclerosis of the base of skull, sandwich appearance of vertebra, normal acid phosphatase levels and no fractures.
4. The findings neither fit in intermediate variety as it presents in an early age. Patient had bone marrow suppression and her age was 22yrs. Intermediate form presents early.

Conclusion

Osteopetrosis may have diverse presentations from asymptomatic clinical picture to severe bone marrow suppression. A detailed clinical examination and radiographic workup are necessary for exact diagnosis. Definitive treatment of the patients with relatively severe disease is still challenging.

Conflict of Interest

None

Funding Source

None

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