INTRODUCTION

Osteopetrosis is a group of rare hereditary skeletal disorders characterized by a marked increase in bone density resulting from a defect in remodeling caused by failure of normal osteoclast function. Defective bone resorption combined with continuous bone deposition produces an increase in the thickness of cortical bone and sclerosis of cancellous bone. Thus leads to development of thick fragile bones with tendency to fracture. Bone sclerosis and obliteration of marrow space leads to extra medullary hematopoiesis causing hepatosplenomegaly and normocytic anemia. Excessive bone deposition in the base of skull narrows the foramina and causing cranial nerve compression, leading to blindness, facial weakness, and hearing defects. Increased susceptibility to infections is common due to granulocytopenia. Other features are broad face, hypertelorism, frontal bossing and snub nose. Delayed eruption and exfoliation of teeth is common. Multiple periapical abscesses with draining sinus tracts are frequent Osteomyelitis of jaw bone, most commonly mandible with extra oral draining sinus tracts are rarely seen. Radiographically, there is widespread increase in bone density. It is difficult to distinguish between medullary and cortical bone.

Clinically, it is classified into two groups; infantile type and adult type. Infantile type is autosomal recessive, it is further divided into malignant osteopetrosis in which patients are diagnosed at birth or early infancy. It is most severe form and leads to death in most of the patients. Other, less severe type of variant is intermediate osteopetrosis. Affected patients are usually asymptomatic at birth but frequently exhibit fractures of bone by the end of first decade. A less common, transient osteopetrosis presents with diffuse sclerosis and associated bone marrow failure but resolves without specific treatment. Genetic defects have been identified in large percentage of patients with osteopetrosis. Mutations found to cause defects in osteoclast function, include the H+-ATPase proton pump, chloride channel, and carbonic anhydrase II. These are important proteins for acidification of resorption lacunae.

CASE REPORT

A 4-year old girl presented to Oral and Maxillofacial Surgery Department, Nishtar Institute of Dentistry, Multan, with history of frequent episodes of fever and pus discharge from non-healing extraction socket from last 2 months. She got treatment from a local doctor for the same problem. There was a history of parental consanguinity, but no family history of such problem in siblings. On general physical examination, patient was short stunted, looking feverish and pale. On maxillofacial examination, there was significant frontal bossing, depressed nose, orbital hypertelorism, swelling on right side of body of mandible with extra oral draining sinus tracts are rarely seen. Vision was intact, and there was significant hearing problem. Maxillary bone looked deficient with no obvious mandibular prognathism. Intraoral examination showed multiple carious teeth with periapical abscesses and draining sinus tracts and non-healing extraction socket and significant pus drainage on right body area. Orthopantomogram (OPG) was advised to rule out any retained root fragment or foreign body. OPG examination showed multiple carious deciduous teeth with periapical radiolucencies and generalized increase of radio opacity (Figure 1). It was difficult to distinguish...
between cortical and medullary bone. Pus sample was collected for culture and sensitivity. On baseline investigations, complete blood count revealed hypochromic anemia with hemoglobin of 5 g/dl. Serum electrolytes were in normal range. Chest, skull and cervical spine radiographs showed generalized dense bone and loss of marrow spaces. No hepatosplenomegaly was found on abdominal ultrasound. Serology for hepatitis viruses, syphilis, and culture for mycobacterium was negative. Parathyroid hormone serum calcium and vitamin D were in normal range. Initially, our diagnosis was osteomyelitis. But after review of clinical examination, radiographic features and laboratory reports, the diagnosis of intermediate osteopetrosis was made.

Transfusion of 250 ml of blood was given after grouping and cross matching to treat anemia. Injectable linezolid was started after culture and sensitivity report, and initial test dose for allergy. Surgical curettage was performed to remove the necrotic bone under general anesthesia. Regular wound debridement with chlorhexidine was performed for one week. Patient was also prescribed antipyretic and nutritional supplements for palliative management. Metronidazole was added for anaerobic coverage postoperatively.

After initial stabilization, patient was discharged from hospital. Parental counselling regarding supportive measures and nutritional support was given. Now the patient is well on regular follow-up.

**DISCUSSION**

Osteopetrosis is a group of hereditary skeletal bone disorders characterized by increased bone density due to defective osteoclast activity, having incidence of 1:250,000 in general population. There are two major clinical patterns; infantile osteopetrosis and adult osteopetrosis or benign osteopetrosis. Infantile osteopetrosis is further subdivided into malignant intermediate and transient osteopetrosis.

Infantile malignant osteopetrosis is autosomal recessive pattern leading to diffuse sclerotic skeleton. Most cases are diagnosed at birth or early infancy. Marrow failure, cranial nerve compression and fractures are frequent. It is most lethal type of osteopetrosis. Intermediate osteopetrosis is less severe and marrow suppression is rare. In transient osteopetrosis, marrow suppression and sclerosis resolve without specific treatment.

Diffuse sclerosis of skull leads to frontal bossing, and compression of cranial nerves results in deafness, blindness, and facial nerve weakness. Extra-medullary hematopoiesis leads to hepatosplenomegaly. Frequent fractures, anemia and granulocytopenia increases susceptibility to infections and osteomyelitis. Multiple retained teeth and periapical abscesses, and post-extraction osteomyelitis are common findings.

Increase in bone density and loss of medullary spaces gives radiographic sign of bone within a bone appearance. OPG is gold standard test for jaw bones and complete dental evaluation. Chest and spinal radiographs are helpful in diagnosis. To assess narrowing of foramina and nerve compression CT and MRI can be helpful.

For diagnosis of osteopetrosis history, clinical examination and radiographic features are sufficient. Bone biopsy is also helpful but genetic testing confirms the diagnosis and subtypes of osteopetrosis.

Different methods of treatment are used for osteopetrosis management. Among all treatments, hematologic stem cell transplantation is curative. Because risks of bone marrow transplantation failure, availability of matched donor and cross-infection, other therapies are widely acceptable. Interferon gamma with calcitriol is used to decrease bone mass. Corticosteroids, parathormone, macrophage colony stimulating factors and erythropoietin are also used to treat osteopetrosis.

Additional therapies such as transfusion, surgical debridement, culture and sensitivity, and antibiotic cover are used for treatment of complications. Hyperbaric oxygen therapy is also used in existing osteomyelitis.

Early diagnosis and referral to maxillofacial surgeon will prevent the serious complications of disease in case of osteopetrosis. Parental counselling and supportive measures, including nutritional support, give additional benefits for patient.

**REFERENCES**


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Oral manifestations of osteopetrosis

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