CASE REPORT

Localized Jaw Enlargement Caused by Renal Osteodystrophy in An Adolescent Patient

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Abstract

A common complication of chronic renal disease is renal osteodystrophy and involvement of the jaws is frequent. However, localized enlargement of the jaws is a rare complication of renal osteodystrophy in adolescent patients. An asymptomatic enlargement of the maxilla in an adolescent patient with chronic renal disease is presented.

Keywords: jaw enlargement; osteitis fibrosa; renal osteodystrophy

Introduction

Renal osteodystrophy associated with chronic renal failure is a major problem in the clinical management of children and adolescents undergoing regular dialysis for end-stage renal disease, and often leads to growth retardation and skeletal deformities in various parts of the body (1-4). We hereby report a patient with chronic renal failure who developed osteitis fibrosa in an unusual localization.

Case Report

A 16-year-old adolescent girl presented with a 5-month history of an asymptomatic swelling along the right maxillary dentition and upper lip. Clinical examination revealed that the patient had enlargement of the right anterior maxilla and displacement of the incisors. The mass extended from the right maxillary canine to left maxillary central teeth, and was firm and non-tender upon palpation. The panoramic radiograph showed a large, osteolytic lesion in the anterior maxilla extending from right canine to left central incisor teeth. Ground glass trabecular pattern, poor definition of crestal bone and loss of lamina dura were prominent in panoramic radiograph, also (Figure 1). Computed tomography (CT) revealed that osteolytic bone lesion caused expansion of the inferior hard palate and the loss of the maxillary cortex extending to nose floor (Figure 2). CT also showed an osteolytic lesion which

Figure 1: Panoramic radiograph showing a large, well-defined osteolytic lesion extending from right canine to left central in the maxilla. Also, generalized loss of lamina dura and ground glass appearance of the jaws can be seen.

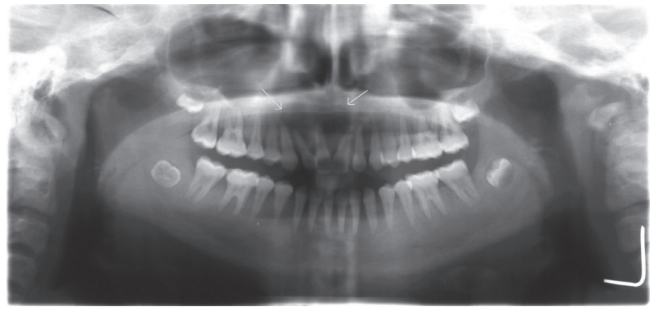

Figure 2: Coronal computed tomography scan showing extensive involving the anteromedial portion of the maxilla. Cortical bone resorption of the palate is identified.

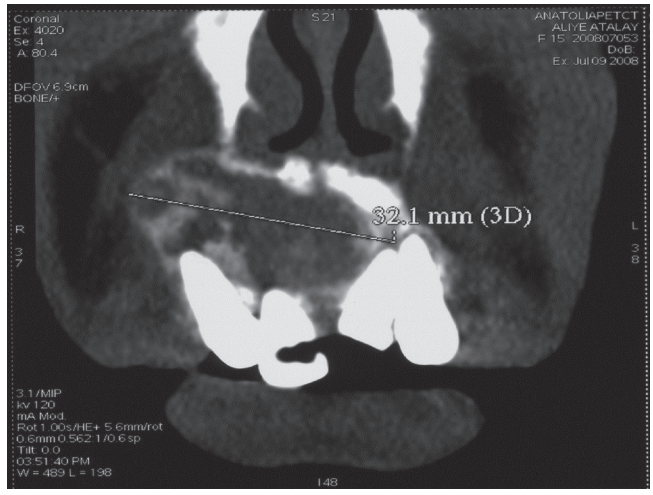

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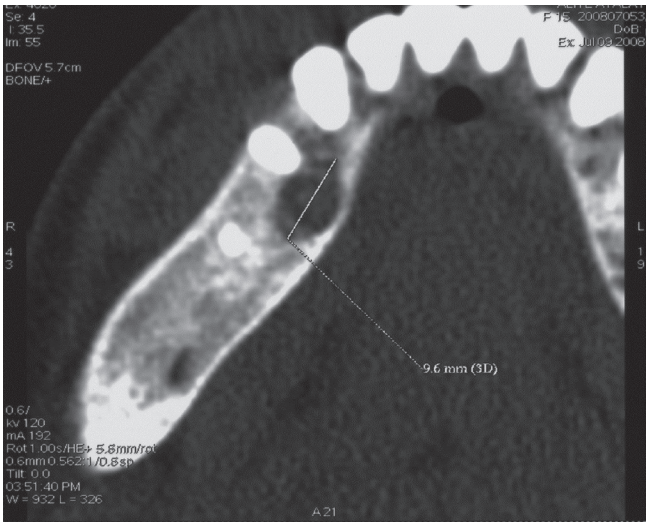
Figure 3: Axial computed tomography scan showing the expansion of cortical bones of the left side of the mandible with thinning of the lingual cortical bone. This osteolytic lesion could not seen in the panoramic radiograph.



caused expansion with thinning of cortical bone of the left mandible (Figure 3).

She was operated on under general anaesthesia, and both of the masses were completely excised. Microscopic examination revealed a fibro-osseous lesion composed of spindle fibroblastic cells and randomly arranged osteoclasts. Multinucleated giant cells within the interstitial hemorrhage were also seen. Histopathological features of the lesion was interpreted to be a benign, high-turnover bone lesion, in particular, osteitis fibrosa.

The clinical, radiographic and histopathological findings were consistent with renal osteodystrophy, and the patient was referred to her attending physician for further investigation and management. Shortly after, she underwent renal transplantation.

Discussion

Chronic renal failure and long-term dialysis alters bone metabolism by multiple mechanisms. Patients with end-stage renal disease may develop a prominent, generalized enlargement of one or both jaws termed renal osteodystrophy (1, 3, 5).

Renal osteodystrophy may be in discrete forms of high-turnover or low-turnover bone disease categories. Osteitis fibrosa and mixed osteodystrophy display features of high turnover whereas adynamic bone disorder and osteomalacia are low turnover osteodystrophies. Osteitis fibrosa, the most frequent type of osseous change in renal osteodystrophy affecting approximately 30% of patients with end-stage renal disease. It frequently involves long bones, ribs and pelvis; however; jaw bones may also be affected. Histopathologic features include proliferation of both osteoblasts and osteoclasts, increased osteoclastic bone resorption as well as an increase in osteoblastic cells and peritrabecular fibrosis. (1, 3-5). Tumour-like lesions consisting of vascular fibrous stroma with giant cells may develop in some areas of the skeleton such as jaws (6).

A variety of oral radiographic changes associated with renal osteodystrophy have been reported in chronic renal disease including, demineralization of osseous structures, diffuse alteration of the normal bony trabecular pattern, generalized loss of the lamina dura, expansion of the jaw bones. These changes may be found in other diseases of the jaws including craniofacial fibrous dysplasia and Paget's disease of bone. Histopathological features of those diseases share many similarities with those of renal osteodystrophy. Craniofacial fibrous dysplasia appears in childhood, stabilizes in early adulthood and is typically accompanied by a normal biochemical profile. Paget's disease affects older adults, and like craniofacial fibrous dysplasia serum alkaline phosphatase level is elevated. A history of chronic renal disease and dialysis is very useful in distinguishing renal osteodystrophy from other diseases (1, 3, 7).

Jaw lesions of renal osteodystrophy may have similarities with Brown tumors and central giant cell tumors as well (3, 7). Hyperparathyroidism is seen in many patients with end-stage renal disease, and is thought to be the most important cause of Brown tumor. The ribs, clavicle, pelvic girdle and mandible are the most often involved bones. Maxillary involvement is extremely rare (3, 8, 9). Jaw lesions of hyperparathyroidism exhibit a picture that is similar to that of central giant cell tumors (3, 9). Due to the radiographic and histologic similarities between Brown tumors and central giant cell tumors, diagnosis of Brown tumor relies on finding evidence of hyperparathyroidism (10).

Renal osteodystrophy associated with jaw enlargement is unusual. A review of the literature revealed 17 cases of jaw enlargement in dialysis patients. Patient age ranged from 19 to 59 years, with mean age of 35 years (1, 3). Phelps et al (11) and Asaumi et al (12) reported cases of diffuse swelling of both jaws in hemodialysis patients with long-standing chronic renal disease. Damm et al described 7 cases of diffuse swelling of both jaws secondary to renal osteodystrophy (13). Jaw radiographic findings in renal osteodystrophy include bone resorption with loss of cortical bone and lamina dura, and other anatomical landmarks and condensation of trabecular architecture producing a ground-glass appearance closely resembling fibrous dysplasia. Generalized involvement is in accordance with the diffuse swelling of the jaws reported in most cases. Conventional radiographs are usually informative, but computed tomography and magnetic resonance imaging allow better recognition of bone lesions (1, 3). Nevertheless, in most cases of severe jaw enlargement in renal osteodystrophy, the jaws failed to return to normal contours even after renal transplantation (8).

Renal osteodystrophy is a long-term complication of chronic renal disease and it causes facial skeleton deformities. Such kind of deformities are rarely seen in adolescent patients. This report emphasizes the radiographic alterations and biologic features of an asymptomatic, localized jaw enlargement caused by renal osteodystrophy in an adolescent patient.

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