Oral Manifestations in a Renal Osteodystrophy Patient - A Case Report with Review of Literature

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ABSTRACT
Renal Osteodystrophy (ROD) is a common complication of chronic renal disease (CRD) and is the part of a broad spectrum of disorders of mineral metabolism that occurs in the clinical setting. It occurs early in the course of chronic renal failure and progresses as the kidney function deteriorates. It is an osseous alteration believed to arise from increased parathyroid function associated with inappropriate calcium, phosphorus and vitamin D metabolism. Involvement of the jaws is common and radiographic alterations are often one of the earliest signs of chronic renal failure. Herein, reporting a case of Chronic Renal Failure (Bilateral Grade I Neuropathy) with ROD presenting oral manifestations in an 11-year-old male child.

Keywords: Renal osteodystrophy, Hyperparathyroidism, Vitamin D deficiency, Oral manifestations

CASE REPORT
An 11-year-old male child reported with a chief complaint of loss of his front teeth along with spacing of upper and lower teeth of his jaws since six months. The patient was apparently normal three years back when his parents suddenly noticed mobility of teeth with drifting and his maxillary right and left central incisors started to become mobile and eventually got exfoliated. Medical history revealed that he was suffering from chronic renal failure (Bilateral Grade I Nephropathy) and was known hypertensive since one year. Patient has also lost weight and inability to stand or walk unsupported since one year. He was also on haemodialysis since six months and on medications such as diuretics, calcium channel blockers, calcitriol and multivitamins since one year. He was advised to take high potassium and a low protein diet. He was reported to dentist for the first time. Family and personal history were noncontributory. General physical Examination revealed that patient had stunted growth with bowing of legs [Table/Fig-1]. Head was normal but the inferior face was widened due to maxillary and mandibular overgrowth. Generalized pallor of skin nails and palpebral conjunctiva was observed. Extaoral examination revealed generalized swelling of the labial surface of alveolus that produced diffuse lymphatic areas of bone were present with loss of inferior cortical thickness. In addition, there was reduction of trabecular pattern which assumed a ground glass appearance. Ultrasonography of the abdomen confirmed the presence of bilateral renal nephropathy.

Patient was subjected to various haematological investigations [Table/Fig-5]. Based on the investigations, in this case serum calcium was below normal and parathyroid hormone (PTH) was above normal which suggested secondary hyperparathyroidism. Low haemoglobin levels indicated that the patient was anaemic. Increased serum levels of creatinine, erythrocyte sedimentation rate, BUN, sodium, alkaline phosphatase (ALP), urinary levels of protein were observed in the case. These findings were deemed consistent with chronic renal failure. Increased Alkaline phosphatase levels were responsible for the diffuse lytic areas in the bone which were observed radiographically. Based on the above findings, final diagnosis of Oral Manifestations of ROD was given.

Patient was referred to the Department of Orthopaedics for rehabilitation prophylaxis and nephrophy for dialysis procedure. Before initiating medical treatment, as a part of dental hygiene programme, oral hygiene improvement measures were commenced for the patient. Patient’s full mouth scaling was performed and teeth with mobility and poor prognosis were extracted under antibiotic prophylaxis with oral antibiotics to prevent the future bacterial endocarditis. The medications included oral antifungals Candid-B mouth paint to prevent secondary candidial infections and were advised to continue the diuretics, nifedipine, calcitriol, multivitamins which he was already taking since one year.

Medical management has commenced for the patient with good dental hygiene. Patient has been planned for full mouth rehabilitation after dialysis procedure is done. The patient’s dental followup was uneventful and under regular checkup every month during his dialysis procedure.

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DISCUSSION

Chronic renal disease (CRD) is a multifactorial syndrome characterized by progressive and irreversible loss of renal mass and function, representing a major health concern. Diabetes mellitus, hypertension, chronic glomerulonephritis, and systemic lupus erythematosus are the most common causes of this disorder [1]. ROD can generate a wide range of oral facial and dental manifestations, such as gingival hyperplasia, periodontal disease, xerostomia, lichen planus, uremic stomatitis, candidiasis, herpes simplex, delayed dental eruption, enamel hypoplasia, and hyperparathyroidism. Secondary hyperparathyroidism affects up to 92% of patients receiving hemodialysis [6]. In our case this was the most common cause for osseous alterations seen in ROD. 

Like any other systemic disease, CRD can cause oral manifestations. One of the early symptoms may be an unpleasant odour in the mouth particularly in the morning. This uremic fetor, an ammoniacal odour is typical sign of all uremic patients caused by high concentration of urea in the saliva. Severe xerostomia is a common finding with a prevalence of 73.2%. If CRF begins early in life enamel hypoplasia may develop which is due to disturbances in calcium and phosphate metabolism. In developing dentition red brown discoloration, delayed or altered eruption may be seen. Tooth mobility and drifting lead to malocclusion. Impaired calcium and phosphorus balance can cause narrowing of pulp chamber and increase the incidence of dental calculus. In some patients marked jaw enlargement is present. Most of the clinical manifestations were present in our case leading to the diagnosis of oral manifestations of ROD [7].

A variety of biochemical markers and radiographic findings have been employed in the diagnosis and monitoring of ROD. Serum parathyroid hormone (PTH) and total alkaline phosphatase (ALP) have been employed in the diagnosis and monitoring of ROD. Serum parathyroid hormone (PTH) and total alkaline phosphatase (ALP)
remain the most widely used biochemical tests for ROD [8]. Increased levels of PTH and total ALP were noted in the present case [1].

Diagnosis of the specific osteodystrophy type is a rather complex process and various biochemical markers and radiographic findings are used so as to facilitate this stage [1]. As a result of dietary control and long term dialysis therapy, many patients with serious renal disease live for extended periods. Hemodialysis is used approximately in 80 % of affected patients . Some recent studies have documented that patients receiving long term hemodialysis may have uremic mixed bone disease with osteitis fibrosa and osteomalacia and it can also be associated with macrognathia [9]. Dental treatment strategy should emphasize oral hygiene and patients should be reinforced frequently in hygiene performance. Symptomatic treatment should include oral antibiotics to prevent the future bacterial endocarditis and oral antifungals should be prescribed to prevent secondary candidial infection [10].

**CONCLUSION**

The incidence of CRD continues to rise worldwide and, as a consequence increasing numbers of individuals with such disease will probably continue to require oral health care. In such a scenario, the dentists are frequently encountered with patients who have oral manifestations both due to renal disease and haemodialysis. So, the systemic evaluation of the patient should be done before diagnosing the oral lesions. Also, we can avoid the potential complications that may arise when we treat such patients and provide them good oral hygiene. Hence, we conclude that oral manifestations of systemic diseases are more frequent and as dentists, we have a vital role in treating them accordingly.

**REFERENCES**


