

ROLE OF ORAL PHYSICIAN IN DIAGNOSIS OF HYPERPARATHYROIDISM

Dr. Bhagyshri. R. Landage¹, Dr. Jaishri S. Pagare²¹Assistant Professor, Dept. of Oral Medicine and Radiology Govt. Dental College and Hospital, Aurangabad. Maharashtra, India.²Professor and HOD, Dept. of Oral Medicine and Radiology Govt. Dental College and Hospital, Aurangabad. Maharashtra, India.***Corresponding Author: Dr. Bhagyshri Landage**

Assistant Professor, Dept. of Oral Medicine and Radiology Govt. Dental College and Hospital, Aurangabad. Maharashtra, India.

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ABSTRACT

Oral physician has an important role in diagnosing patients with systemic diseases which can save the patient's life, one such systemic disease which is diagnosed on incidental findings of oral manifestations is hyperparathyroidism. Parathyroid hormone plays an important role in the metabolism of calcium and phosphorus; influencing the mineralization of bone and teeth. Parathyroid disorder may lead to hyper or hypo secretion of hormone, which results in various oral manifestations. Common oral manifestations in patients with hyperparathyroidism (HPT) are brown tumor, loss of bone density, soft tissue calcification, and dental abnormalities. Dental management of patients with HPT involves a higher risk of bone fracture, whereas in hypo parathyroidism the caries control is the main concern. It is important that the dentist be aware of the risks and difficulties that may arise during the dental management of these patients. Earlier the diagnosis better is the treatment. As rightly said mouth is mirror of the body many diseases are diagnosed with oral and maxillofacial manifestations which can be the initial or the only signs of the disease. Thus, emphasizing the role of oral physician in diagnosis and further management of the patient.

KEYWORDS: Hyperparathyroidism, Oral Physician, Oral manifestations.**INTRODUCTION**

Parathyroid consists of four small glands (3 mm wide × 6 mm long × 2 mm thick), with dark brown in color, which are paired and located behind the thyroid gland in the neck. Parathyroid glands produce and release parathyroid hormone (PTH), which is involved in regulating the metabolism of calcium and phosphorus.^[1] So, it plays an important role in tooth and bone mineralization, increases the bone resorptions, stimulates formation of active metabolite of Vitamin D in the kidneys, which promotes the intestinal absorption of calcium and decreases renal re absorption of phosphate. Normal PTH is about 1.5- 5.5 ng/dl.^[2]

Management of medically compromised patients is challenging, which requires early diagnosis and prompt treatment.^[2] Oral physician is the health care professional who takes immense pride in this situation where by the oral and maxillofacial manifestation the disease is diagnosed.^[3] The present case report is a hyper parathyroid patient who is diagnosed with oral clinical features and incidental radiological features.^[2]

CASE REPORT

An 18 years old male patient came to department of Oral Medicine & Radiology, with chief complaint of pain and

obliteration of buccal vestibule in right posterior teeth region. Patient initially went to the local dentist for the complaint and he took IOPA for the same & gave history root canal treatment with diagnosis of periapical infection. Unfortunately pain did not subside which made patient come to visit our institution. Past Dental history revealed of the endodontic treatment and restoration. No relevant medical history was given by patient. Family & habit history were not contributory.

History of tiredness, lethargy, bone pain & mild state of confusion was given by the patient. Physical examination shows normal vital signs. His neck examination show no goitre /nodule. No pulsations or fluctuant areas were noted.

Intra-oral examination shows discolored tooth (46) as shown in (Fig.1) obliteration in the buccal vestibule as well as temporary filling associated with 46 was noted. To know the pathology associated with the tooth, we took IOPA as shown in (Fig.2) which shows indistinct loss of lamina dura, periapical radiolucency extending from distal to second premolar and mesial aspect of second molar with altered bony trabeculae showing ground glass appearance. A radiopaque restorative material in the crown of 46 as mentioned in (Fig. 2)

shows indistinct lamina dura. Taking into the consideration OPG was taken to rule out localized or generalized loss of lamina dura & other radiolucencies. The orthopantomogram (OPG) was taken as shown in **(Fig.3)** & it was noted that a generalized loss of lamina dura with thinning of inferior border of mandible bilaterally at angle region. Multiple radiolucencies in mandibular anterior & posterior region with corrugated margins with no root resorptions at periapical region with 46 altered bony trabeculae and inferior alveolar nerve canal is also not traceable bilaterally. With missing left mandibular first molar, erupting all four third molars and radiopaque filling noted in right mandibular first molar **(fig.3)** Taking some systemic conditions in consideration – A hand- wrist radiograph was taken showing signs of subperiosteal erosion, no other bony changes were noted as shown in **[Figure 4]**.

Cone-beam computed tomography (CBCT) examination was performed as shown in **(Fig.5)** CBCT examination showed, bicortical expansion; however the cortical outlines were hypo calcified with perforation in the lingual cortical plate, showing ground glass appearance

and loss of lamina dura. Decrease in trabecular density can be appreciated.

After clinical and radiographic examination and correlating it with the history of patient (no history of chronic kidney disease and dialysis), a provisional diagnosis of primary HPT was made with differential Diagnosis of periapical inflammatory conditions, Fibrous Dysplasia, Paget's disease.

To confirm the provisional diagnosis patient was referred for biochemical reports as mentioned In **(Table.1)** and report were positive for the hyperparathyroidism status. This shows increased alkaline phosphate with upper limit of serum phosphates level with normal calcium level as shown in the **(Table.1)** Provisional diagnosis was confirmed as hyperparathyroidism. Thus the final Diagnosis of Primary hyperparathyroidism as there is no any kidney disease was made. For detection of parathyroid adenoma and further investigations like USG of neck and CT scan of neck patient is referred for General physician consultation and medical referral were made and kept under follow up.



Fig. 1: Showing findings seen on intra-oral examination.



Fig. 2: Showing findings seen on intra-oral periapical radiograph showing periapical radiolucency.

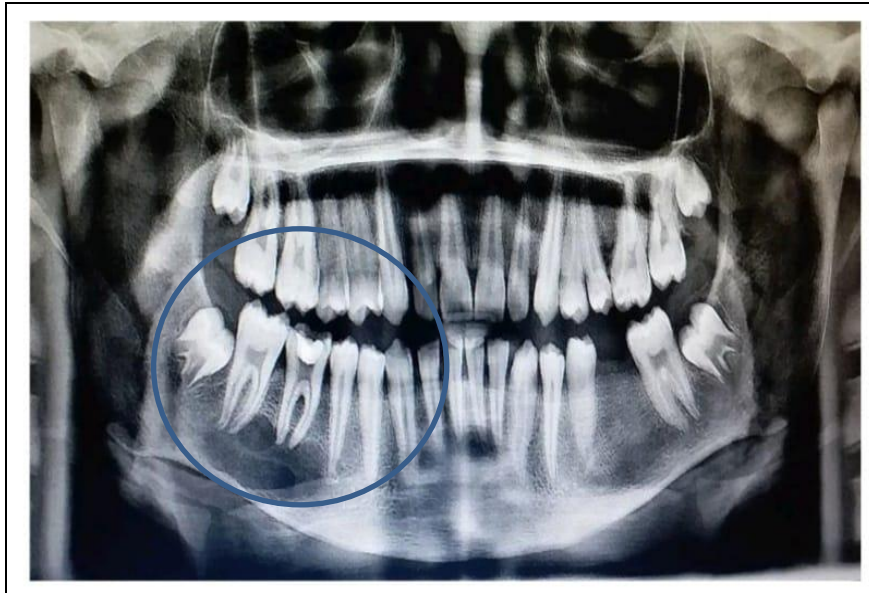


Fig. 3: Orthopantomograph showing radiolucency in the right mandibular body region.



Fig. 4: Hand-wrist radiograph showing sub periosteal erosions.

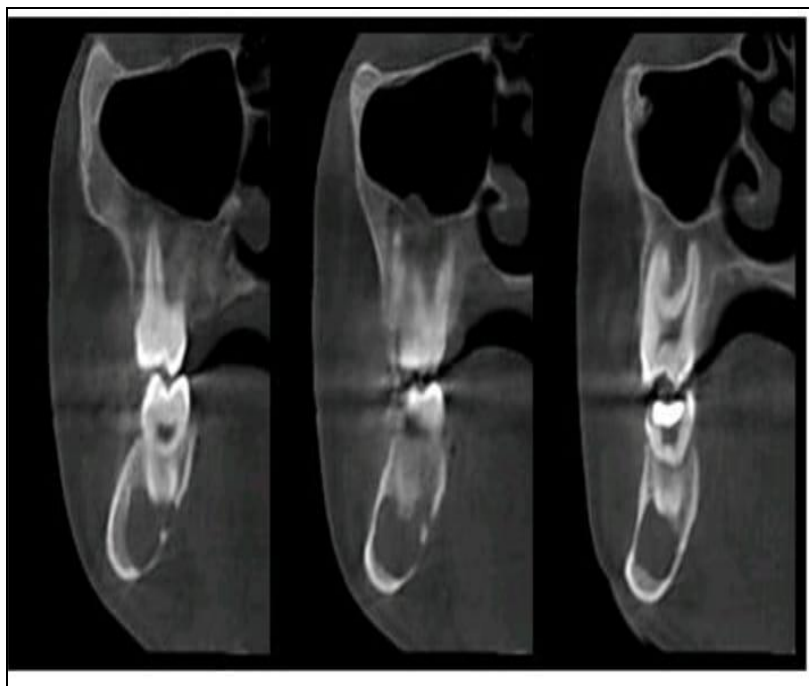


Fig. 5: Advanced imaging by CBCT appreciating changes.

Table 1: Showing Biochemical reports.

Test	Patients value	Normal Values	Interpretation
Serum Calcium	10.6	8.-11 mg/dl	Normal
Alkaline phosphates	155	53-155 IU/L	Borderline
Parathormone	277.1	14-72 pg/mL	Increased

Table 2: Parathyroid Function Test^[11]

	Calcium	phosphate	Alkaline phosphate	urea
Primary without bone lesion	Increased	Decreased	Normal	Normal
2. With bony lesion	Increased	Decreased/Normal	Increased	Normal/Increased
Secondary Hyperparathyroidism Due to Renal failure	Normal/Decreased	Normal /Increased	Normal/Increased	Increased
Due to Malabsorption	Normal/Decreased	Decreased	Increased	Normal
Tertiary hyperparathyroidism 1.with bone lesion	Increased	Normal/Decreased	Increased	Normal/Increased
2.without bone lesion	Increased	Decreased	Normal	Normal/Increased

Table 3: summary and differentiating feature of the types of hyperparathyroidism.^[6,7,8,11]

Cause of hyperparathyroidism	Parathyroid adenoma parathyroid hyperplasia Parathyroid carcinoma	Parathyroid hyperplasia	Autonomous module on top of hyperplasia Chronic kidney disease.
	Result from benign tumor from one of parathyroid gland	Conditions like renal failure, intestinal malabsorption.	When long-standing secondary hyperplasia becomes autonomous in spite of correction of the underlying stimulant (renal transplant)
Sign and symptoms	Bone pain, muscle weakness, long bone fracture, swollen joints, nephrolithiasis, occasionally peptic ulcers, pancreatitis, hypertension.	Abdominal groans, stones, tender bones, psychic moans, and fatigue overtones.	Bone pain, muscle weakness, long bone fracture, swollen joints, nephrolithiasis, occasionally peptic ulcers, pancreatitis, hypertension
Radiological findings	1.obliteration of pulp chamber 2.Alteration of Dental eruption 3.Loosing & Drifting of teeth 4. Loss of lamina dura	1.obliteration of pulp chamber 2.Alteration of Dental eruption 3.Loosing & Drifting of teeth 4. Loss of lamina dura	1.obliteration of pulp chamber 2.Alteration of Dental eruption 3.Loosing & Drifting of teeth 4. Loss of lamina dura

	5. periodontal ligament widening 6.chondrocalcinosis 7.ground glass appearance	5. periodontal ligament widening 6.chondrocalcinosis 7.ground glass appearance	5. periodontal ligament widening 6.chondrocalcinosis 7. ground glass appearance
Laboratory Investigations	Increased level of PTH, hypercalcemia, elevated alkaline phosphates levels and decreased phosphorus levels.	Serum calcium [↓] PTH [↑] Elevated PTH and Alkaline phosphates with normal or low serum calcium levels confirm the diagnosis and also help in differentiating it from primary variant.	Serum calcium [↑] PTH [↑]
Management	1.Of Acute hypocalcaemia 2.medical line- avoid thiazide diuretics 3.Maintain oral fluid intake Surgery Surgical excision of adenoma.	Correcting vit D deficiency Treatment of renal disease. Active Vitamin D A combination of dietary phosphorus restriction, phosphate binders, calcimimetics, and Vitamin D analogs can be used	Total or subtotal parathyroidectomy Autotransplantation of parathyroid tissue.
Diagnostic imaging Technique	Ultrasonography, MRI or CT have sensitivity about 52-75%. Highest sensitivity in localization of ectopic parathyroid adenoma has sestamibi scintigraphy with technetium-99.	Ultrasonography, MRI or CT have sensitivity about 52-75%. Highest sensitivity in localization of ectopic parathyroid adenoma has sestamibi scintigraphy with technetium-99.	Ultrasonography, MRI or CT have sensitivity about 52-75%. Highest sensitivity in localization of ectopic parathyroid adenoma has sestamibi scintigraphy with technetium-99.

DISCUSSION

Hyperparathyroidism (HPT) was first described by Von Recklinghausen in 1891, reported patients with a condition called osteitis fibrosis cystica.^[4] It affect 0.05-0.1% of general population. The prevalence is 1 in 400 female & 1 in 1000 male.^[2] It usually affects middle aged person.^[5] The term hyperparathyroidism was coined by Henry Dixon and colleagues.^[6] it was realized that hyper PTH has a multiple system effect on body such as renal system, skeletal system, early effect on bone such as subperiosteal erosions and loss of lamina dura.^[7] cortisone test was used to differentiate between hypocalcaemia and HPT.^[8] Diagnosis usually made by levels of Serum parathyroid hormone (normal range 14-72pg/ml) and calcium (normal range 8-11mg/dl) Alkaline phosphatase (normal range 53-155 IU/L).^[3]

The oral physician plays important role in the detection of HPT.^[3] Occasionally, the first sign of the disease may be a cyst in the jaw. The disease should be considered by the dentist whenever single or multiple radiolucencies are observed on radiographs of the jaw. It is important for an oral physician to be aware of the various oral and extra oral findings so that the disorder will be diagnosed correctly followed by a precise and prompt treatment. There is higher risk of bone fracture, before providing endodontic treatment.^[9]

This report also stresses upon taking good past history as radiolucency at periapical region was initially misdiagnosed with endodontic origin. This warrants for being suspicious with the teeth with failed treatment.^[9] Management of medically compromised patients is challenging and requires a multidisciplinary approach.

Oral physician is the health care professional who plays a vital role in diagnosing the hidden diseases which are manifested by oral maxillofacial manifestations.

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