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Unveiling the Unseen: A Rare Case of Partial Anodontia Linked to Hypoparathyroidism

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ABSTRACT:
Hypoparathyroidism is a rare endocrine disorder characterized by insufficient secretion of parathyroid hormone (PTH), leading to low calcium levels (hypocalcemia) and elevated phosphate levels (hyperphosphatemia). This condition has notable systemic and dental effects, such as delayed tooth eruption, missing teeth (hypodontia), and enamel defects. In this case report, we discuss a rare instance of partial anodontia in a 22-year-old female patient with hypoparathyroidism. The patient presented with multiple missing teeth, delayed exfoliation of primary teeth and impacted permanent teeth. Through evaluation including Clinical examination, radiographic imaging, and laboratory tests confirmed the diagnosis based on classic symptoms. The patient's medical history, combined with her oral and systemic conditions, highlights the need for interdisciplinary approach in managing such cases. Early recognition of dental anomalies related to hypoparathyroidism can lead to timely treatment and improve patient outcomes. This report underscores the important role dental professionals play in identifying and managing the oral manifestations of systemic disorders.

1. INTRODUCTION

The endocrine system regulates physiological processes and maintains homeostasis through hormone secretion, closely interacting with the central nervous system, particularly via the hypothalamus and pituitary gland [1]. The parathyroid glands, located behind the thyroid, produce parathyroid hormone (PTH), calcium and phosphorus metabolism. Hyperparathyroidism (HPT) is characterized by excessive PTH secretion, hypercalcemia, and increased osteoclastic activity. It affects 0.05%-0.1% of the population, with women being more susceptible than men. Hypoparathyroidism is a rare disorder with deficient or absent PTH, leading to low calcium level and high phosphorus levels, posing challenges in managing hypocalcemia while preventing complications like hypercalciuria[1] . Hypoparathyroidism impacts dental development, leading to delayed eruption, retained primary teeth, altered jaw growth, and multiple impacted teeth with shortened roots [2-4]. Patients may also exhibit brown tumour and uncoordinated mandibular development. Dentistry has played a significant role as dental abnormalities, including anodontia (missing teeth), are common features of hypoparathyroidism. This has led to the development of specialized dental treatments and interventions to improve oral health and quality of life for affected individuals. In dentistry this condition has been studied for its impact on dental development leading to innovation in prosthetic dentistry and dental implants to address tooth loss in affected individuals. Additionally, research has focussed on genetic basis of the condition and its manifestations for dental health aids in early diagnosis and management [5].

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Figure 1 : Clinical photograph showing frontal and lateral view

2. CASE PRESENTATION:

A 22-year-old unmarried female patient presented to our department with a chief complaint of multiple missing teeth for the past 6years., first noticed at age of 14years. Then she noticed delay in the exfoliation of primary dentition, and she is experiencing difficulty in speech and mastication. The absence of multiple permanent teeth.The patient's medical history included a right femoral fracture treated with open reduction and internal fixation under general anesthesia four years ago, with an uneventful recovery. The family history revealed consanguineous marriage between parents. Additionally, the early deaths of her elder brother at age of 24 and younger sister at age of 20 respectively, although no medical records were available for these relatives. The patient's diet was mixed, bowel and bladder habits were normal, but she experienced disturbed sleep patterns and irregular menstrual cycles for the past six years. Systemic examination revealed normal vital signs, though pallor was noted. Clinical examination revealed specific dermatological changes including periorbital wrinkling, fine hair, dry skin, depressed nasal bridge and short stature. The extraoral examination showed a sunken facial appearance with prominent supraorbital ridges.

Figure: 2.a

Figure: 2.b

Figure: 2.c

Figure 2: Clinical photograph showing a)short stature , b)hand, c)foot

Figure 3: Clinical photograph showing periorbital wrinkling

The intraoral examination revealed stiffness on both the upper and lower labial mucosa, thick everted dry pigmented lips, and angular cheilitis at the oral commissures. Presence of depapillation in tongue. The buccal mucosa, hard palate, soft palate and uvula appeared normal.

Journal of Chemical Health Risks
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Figure 5 : Intraoral photograph showing multiple missing teeth, depapillation of tongue and angular chelitis

Dental examination indicated multiple missing teeth with only teeth 12, 15, 16, 22, 25, 26, 27, 37, 38, and 48 remaining intact.

The vertical dimension of the patient's face was reduced. An orthopantomogram (OPG) confirmed the presence of impacted teeth and resorption of alveolar bone (Figure 6).

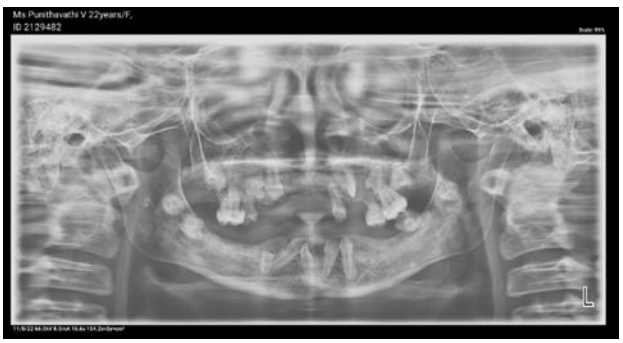

Figure 6 : Orthopantomograph (OPG) revealing multiple unerupted and impacted permanent teeth and retained primary teeth in both jaws.

Laboratory Investigations revealed significantly low levels of serum calcium, phosphorus, and potassium & low level of blood parameters like hemoglobin, PCV, MCV, MCH and low level of Parathormone.

By considering patient history, clinical findings, radiographic findings and along with the laboratory investigations, gave a diagnosis of hypoparathyroidism with associated dental anomalies.

3.DISCUSSION:

Tooth impaction is a relatively common occurrence. However, multiple tooth impactions are rare and typically associated with metabolic disorders or syndromes. The underlying causes of impaction can be classified into idiopathic, local, or systemic factors. Local causes include regional odontodysplasia, mucosal barriers, radiation damage, and arch-length deficiency. Systemic causes often include conditions such as hypothyroidism, hypoparathyroidism, nutritional deficiencies, vitamin D-resistant rickets, osteopetrosis, Gardner's syndrome, and cleidocranial dysplasia. Idiopathic causes may be linked to abnormal eruptive forces, trauma to tooth germs, or defects in the eruptive mechanism.

Bayar et al. reported that multiple impacted teeth are frequently associated with syndromes like Gardner's syndrome or cleidocranial dysplasia. Hypoparathyroidism is a condition characterized by parathyroid hormone (PTH) deficiency, can arise from genetic, surgical, autoimmune causes, or systemic diseases such as DiGeorge, Schprintzen, or velo-cardio-facial syndrome. Reduced PTH levels lead to imbalances in calcium and phosphorus, resulting in hypocalcemia and hyperphosphatemia. Clinical manifestations of hypocalcemia include tetany, myalgia, dysphagia, irritability, anxiety, depression, and in severe cases, psychosis or convulsions. Increased neuromuscular excitability can be identified using clinical signs such as Chvostek's and Trousseau's signs.

In the present case, typical clinical signs like Chvostek's or Trousseau's were absent. However,

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oral manifestations of hypoparathyroidism such as delayed eruption of permanent teeth, multiple retained primary teeth, enamel hypoplasia, poorly calcified dentin, widened pulp chambers, dental pulp calcifications, short or blunted roots, and hypodontia were evident. The primary and permanent teeth were not subjected to ground sectioning to assess the exact defects in enamel and dentin.

There are two primary forms of hypoparathyroidism:

Idiopathic hypoparathyroidism (IHP) and Pseudohypoparathyroidism, differentiated by their response 1to treatment with PTH and vitamin D. Both types are associated with distinctive skeletal abnormalities, particularly shortened metatarsal and metacarpal bones, which can be diagnosed through radiographic studies.

Dental manifestations of hypoparathyroidism, including disturbances in tooth formation and eruption, are often overlooked but can serve as key indicators for further investigation. In this case, the delayed eruption of permanent teeth was a significant finding. Management of hypoparathyroidism involves calcium supplements, high doses of vitamin D, and a calcium-rich, low-phosphorus diet. Dental treatments can be provided with careful medical management and regular follow-up.

Patients with hypoparathyroidism are more prone to dental caries due to enamel defects, which necessitates periodic check-ups and oral hygiene guidance. The presence of pulp calcifications and malformed roots can complicate endodontic procedures, while ankylosis may make extractions difficult. Delayed eruption and hypodontia often result in malocclusion, requiring interceptive orthodontic care. Importantly, before any dental treatment, serum calcium levels should be assessed to prevent complications such as cardiac arrhythmias, seizures, or laryngospasms during the procedure.

Diagnosis of anodontia, especially partial forms, typically requires radiographic evaluation. In this case, an orthopantomogram (OPG) at an early age would have helped confirm the absence of permanent teeth and some of the impacted permanent tooth seen[23] . Early detection is critical in guiding the management of such patients to prevent complications arising from dental agenesis, such as loss of function and aesthetic concerns. The treatment plan for this patient, involving complete dentures after the exfoliation of the remaining primary teeth, aligns with the standard approach in cases where dental agenesis affects oral functionality and aesthetics.

Figure 9 : Post operative view after prosthetic replacement

CONCLUSION :

In conclusion, the early dental manifestations of hypoparathyroidism provide critical clues to the underlying systemic condition. Oral health care professionals, play a pivotal role in the early identification through clinical and radiographic examination and management of this disorder. It can significantly improve patient outcomes, preventing long-term complications and contributing to overall systemic health. Therefore, collaboration between dental and medical

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professionals is essential for holistic patient care in cases of hypoparathyroidism.

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