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Multiple retained deciduous and abnormally impacted permanent teeth in non-syndromic patient– A CBCT Presentation

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ABSTRACT

This case report presents a 21-year-old non-syndromic male patient with multiple impacted permanent teeth and retained deciduous teeth, a rare dental anomaly typically associated with syndromes or systemic conditions. The patient exhibited no systemic or familial anomalies, and his clinical presentation included missing teeth, retained primary teeth, and difficulties with mastication. Cone Beam Computed Tomography (CBCT) was utilized for detailed imaging, revealing various types of impactions including vertical, mesioangular, horizontal, and inverse, as well as rotated teeth. A multidisciplinary treatment plan was formulated involving extractions, root canal therapy, and comprehensive orthodontic management. The case emphasizes the value of CBCT in accurate diagnosis and treatment planning, particularly in non-syndromic cases where traditional radiographs may be insufficient. It also highlights the importance of early intervention, a collaborative approach, and ongoing research in understanding idiopathic cases of multiple impactions to achieve functional and aesthetic rehabilitation.

Keywords: *Multiple impacted teeth, retained deciduous teeth, non-syndromic, CBCT, idiopathic impaction, multidisciplinary approach.*

1. INTRODUCTION

The phenomenon of multiple impacted permanent teeth, often occurring alongside retained deciduous teeth, presents a significant clinical challenge in dentistry. The impacted teeth are known as the teeth which cease to erupt before emergence to the oral cavity [1].Multiple Impacted teeth represent a common dental issue, particularly in adolescents and young adults and may be related to syndromes and metabolicdisorders [2].

According to a review by Bishara the causes of toothimpaction are divided into generalized and localizedfactors. The common causes are usually localized: lackof space for eruption, prolonged retention or early loss ofthe deciduous tooth, abnormal position of the tooth bud,the presence of alveolar cleft, ankylosis, cystic orneoplastic formation, alveolar or dental trauma, anddilaceration of the root [3]. As for the general factors, themost common syndromes associated with toothimpaction are cleidocranial dysplasia (CCD), Down syndrome, Gardener's syndrome, Yunis–Varon syndrome, Endocrine deficiencies (hypothyroidism and hypopituitarism) [4].

In some cases, however, impaction of multiple teeth is not due to any syndrome. In cases where the cause is idiopathic, understanding the multifaceted effects becomes crucial for effective management and patient care emphasizing the need for

a multidisciplinary approach to restore optimal oral health and function.This case report presents a detailed evaluation of multiple impacted teeth and retained teeth in non-syndromic patient utilizing Cone Beam Computed Tomography (CBCT) for comprehensive imaging and analysis.

2. CASE REPORT

A 21-year-old male patient presented with chief complaints of multiple missing teeth. His dental history revealed usual loss of primary teeth with subsequent failure of eruption of few permanent teeth leading to difficulty in mastication. His familyhistory was non contributory. On general physical examination, the patient was foundcooperative, of moderate built, and well oriented to the time andplace and the surroundings.

Extraoral examination: revealed no facial asymmetry or swelling on any parts of body. On intraoral examination, a total of 23 teeth were present in the patient'soral cavity. The patient had multiple retained deciduous teeth i.e. 53, 63, 82, 83, and 84 with missing permanent18, 13, 23, 28, 38, 33, 42, 43, 45, 46, 47, 48. Grossly decayed teeth i.r.t 11, 12, 36, 37, 84 and retained rootpieces with 21, 35, 53, and 63. Only 1/3rd of crown portion was visible with 44.

Based on the chief complaint and clinical examination a provisional diagnosis of abnormally missing teeth with retained deciduous teethwas made while the list of differential diagnosesincluded hypothyroidism, hypoparathyroidism, cleidocranialdysplasia, and Gardener's syndrome as the commoner conditionsassociated with such type of clinical presentation.

The patient was advised OPG, and CBCT, and other diagnostic tests to rule out syndromes. OPGrevealed the presence of impacted and unerupted permanent teeth. A CBCT scan was performed to assess the extent of impaction and the spatial relationships between the retained teeth and impacted permanent teeth. The CBCT findings revealed:Vertically impacted 13, 23, 33, 42, 43, 44, and 45 [Figure 1, 2, and 3].Mesioangularimpacted 18,28, 38 and 48 and Horizontally impacted 46, 47. 46 was inversely impacted with crown facing ramus of mandible and root towards chin. The crown of 46 and 47 meet face to face, and rotated 44 and 45. Retained 53, 63, 82, 83, 84[Figure 4].

Figure 1. Three dimensional CBCT image Facial aspect showing impacted and retained teeth

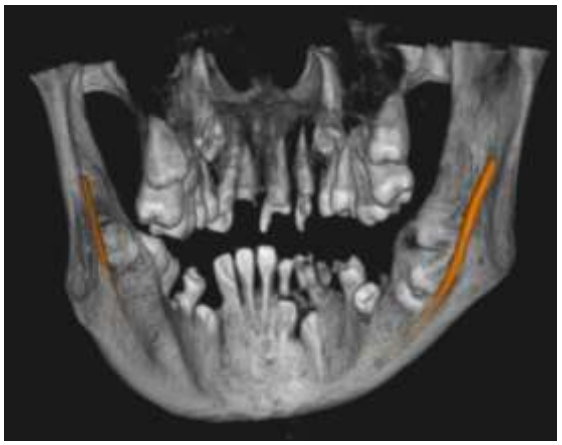

Figure 2. Three dimensional CBCT image Lingual aspect showing impacted and retained teeth

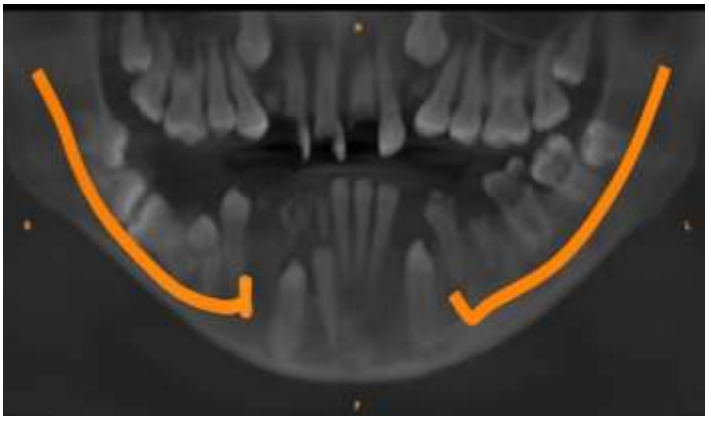

Figure 3. Reconstructed panoramic image of CBCT showing impacted and retained teeth

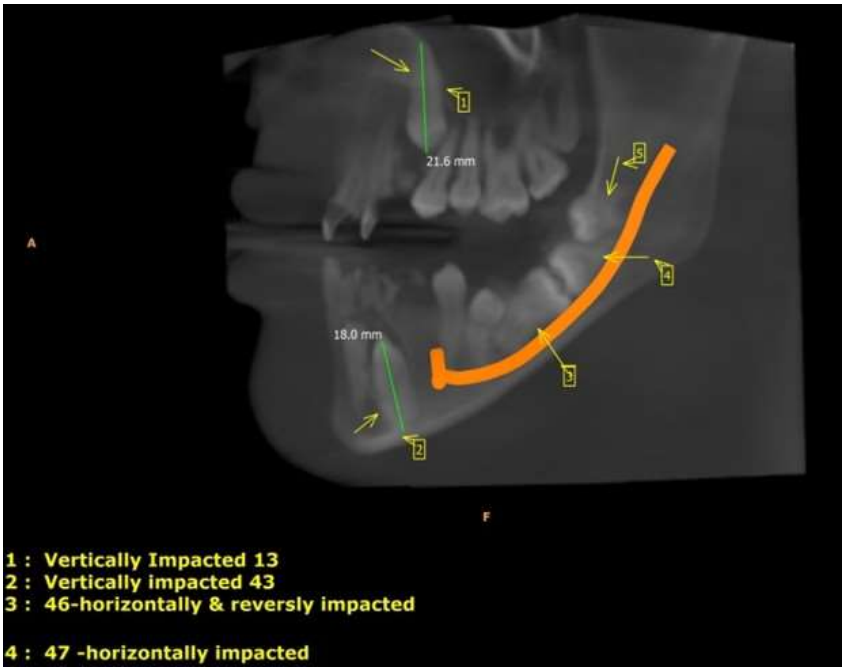

Figure 4. Sagittal section of CBCT showing impacted and retained teeth

Diagnosis and Treatment Plan

The findings indicated multiple impacted permanent teeth associated with retained deciduous teeth, likely contributing to the patient's symptoms and dental malocclusion. The idiopathic nature of the impaction was noted, as no systemic factors or anomalies were identified.

Based on the findings from the clinical, OPG and CBCT evaluation, the following treatment plan was proposed. Extraction of the retained deciduous teeth 53, 56, 82, 83, 84 was scheduled to create space for the impacted permanent teeth to erupt. Extraction of permanent root pieceof 21. Root canal treatment with 11, 12 and 36. Following extraction, comprehensive orthodontic treatment using fixed appliances was recommended to align the permanent teeth and correct the occlusion. Periodic evaluations were planned to monitor the eruption of permanent teeth and adjust the orthodontic treatment as necessary.

3. DISCUSSION

The reported data from literature shows that dental impactions affect 25% to 50% of the population[5].Multiple impacted teeth arerarely seen and are usually associated with underlying systemicconditions and syndromes. The differential diagnoses in such cases are Cleidocranialdysostosis, Gardners syndrome, Gorlin–Sedano syndrome,and Yunis–Varon Syndrome. In the case of cleidocranial dysplasia the patients usually exhibit high-arched palate with prolonged retention of the deciduous teeth leading to subsequent delay in eruption of the deciduous teeth]6].

This case highlights the importance of CBCT in diagnosing and managing complex dental conditions involving impacted and retained teeth. The three-dimensional imaging provided critical insights into the spatial relationships and anatomical considerations that are not discernible through traditional two-dimensional imaging.

GorlinSedano syndrome represents as short hands, foot bones with short and straight collar bone along with multiple impacted teeth. Features of Yunis–Varon syndrome are agenesis or hypoplasia of clavicle, severemicrognathia, digital anomalies, hypodontia, spinal defects, and impacted teeth [7].

In the case of hormonal disorders hypothyroidism, hypoparathyroidism, and Pseudo hypoparathyrodism are to be considered.Estimation of T3, T4, and TSH is required for diagnosing hypothyrodism where there is low serum T4 and elevated TSH.Metabolic disorders like Vitamin D deficiency rickets are also associated with impacted teeth[8].

In the present case, dental history and radiographic examination showed multiple impacted permanent teeth. The medical and family histories along with extraoral examination were not suggestive of any syndrome or metabolic disorder.Only a few cases of nonsyndrome multiple impacted teeth were reported in the literature [5,6, 9-11] and when they do occur, the prevailing explanation is often related to physical barriers that prevent tooth eruption [12].

Effective management of multiple impacted permanent teeth with retained deciduous teeth requires a multidisciplinary approach. Dental professionals, including orthodontists, oral surgeons, and general dentists, must collaborate to devise a comprehensive treatment plan tailored to the individual patient's needs [12].

The duration and outcomes of treatment for these less common cases of multiple impactions are significant concerns compared to the more frequently encountered single impaction cases. A multidisciplinary approach is essential, as treatment must address aesthetic, functional, and oral health issues[13, 14].For unerupted teeth, orthodontic extrusions may be considered, but due to the potential for complications associated with impacted teeth, surgical removal is generally advised. Rehabilitation plans should involve collaboration with a prosthodontist and implantologist to ensure effective use of fixed dentures. The primary goals of treatment should be to achieve stable results, improve aesthetics, and restore oral health and function[15].

Proper diagnosis is required for successful treatment of multiple impacted teeth. Traditional 2D radiographs like panaromicview is used to evaluate the vertical position. CBCT scanning combined with 3D rendering techniques produce high resolution images that have been proven to be useful for the diagnosis of impacted teeth [16].

The 3D data helps to determine the exact location, inclinationand abnormal morphology of the impacted teeth as well as their distances from adjacent roots. This not only help the surgeon during surgical procedure but facilitate a more clinically-orientated treatment approach 15,16].

4. CONCLUSION

Managing multiple impacted permanent teeth alongside retained deciduous teeth presents a complex clinical challenge that demands timely and multidisciplinary intervention. Patients often experience physical discomfort, including pain, swelling, and impaired oral function, which may significantly affect their quality of life. Beyond the physical symptoms, the psychological impact—such as anxiety, reduced self-esteem, and social withdrawal—further underscores the need for comprehensive care.The idiopathic nature of many cases complicates both diagnosis and treatment planning. When the underlying causes remain unclear, clinicians must rely on a holistic, individualized approach. Effective treatment typically involves a combination of surgical extraction, removal of retained deciduous teeth, and orthodontic therapy aimed at restoring proper alignment and function.

Early detection and intervention are critical to preventing long-term complications and improving outcomes. A collaborative approach among dental specialists ensures that patients receive personalized care, addressing both functional and aesthetic concerns. This not only enhances oral health but also contributes to the patient’s psychological well-being and overall confidence.In summary, prompt and tailored treatment strategies are essential in managing the complexities associated with multiple impacted and retained teeth. Ongoing research into the etiologies and prevention of impactions is vital to advancing care and minimizing the burden of these challenging dental conditions.

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