

Deficient Alveolar Bone with Multiple Unerupted Permanent Teeth

Ram Sukh, Alka Singh, Pradeep Tandon, Gyan P Singh

ABSTRACT

Deficiency in alveolar bone with multiple unerupted permanent teeth without any known etiology is a rare dental anomaly. Various local and systemic factors have been usually related to the multiple unerupted permanent teeth. In this case report we present a case of deficient alveolar bone in maxillary tuberosity region with multiple unerupted permanent teeth and make an effort to find out all possible causes of it. It is critical to diagnose and make proper treatment plan for eruption disturbance in early stage because treatment at a later stage is usually more complicated. The patient management in such cases needs to be planned specifically from multidisciplinary standpoint.

Keywords: Alveolar bone, Eruption disturbance, Unerupted teeth.

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INTRODUCTION

In normal eruption scenario, permanent teeth will erupt uneventfully and replace their primary predecessors. However, sometimes teeth fail to erupt. Most of these unerupted teeth are deviated or angulated aberrantly and eventually lose their potential to erupt and be referred to as impacted teeth. Impaction involving a single tooth is a commonly observable finding. But impaction of multiple teeth is an uncommon phenomenon.

The etiology of multiple impactions may be local factors, systemic factors and idiopathic.¹ While systemic causes will result in more generalized impactions, local causes tend to affect one or few teeth. In the literature, most of the reported cases of multiple impacted teeth are associated with syndromes.² There were few reports related to multiple unerupted teeth with no obvious etiology.^{1,3-8} The present article highlights a case of deficient alveolar bone with multiple unerupted permanent posterior teeth both in maxillary and mandibular arch, not associated with any disorder.

CASE REPORT

A 23-year-old male patient came to the Department of Orthodontics and Dentofacial Orthopedics at Faculty of Dental Sciences, King Georges Medical University,

Lucknow, India, for orthodontic consultation regarding missing teeth. Patient has chief complain of missing upper and lower back teeth with difficulty in mastication. Patient's past dental history revealed normal shedding of primary dentition. Patient was born to nonconsanguineous parents. Her past medical history was completely unremarkable. He was the product of a normal term delivery and had experienced no serious illness. Family history described that his parents and his siblings do not have any physical or systemic disorders and having normal dentition.

On general examination, the patient was moderately built and nourished and did not exhibit any physical or skeletal abnormality and showed no signs of mental retardation. Clinical examination of his respiratory system, cardiovascular system, liver and spleen, ophthalmological and neurological examination revealed no pathological symptoms.

On extraoral clinical examination, the patient had a straight profile and competent lips (Fig. 1). There were no mandibular deviation on opening and closing, no TMJ problem and no gross facial asymmetry. On intraoral examination, many of posterior teeth were missing in both arches bilaterally. In maxillary arch missing teeth were 15, 16, 17, 18, 25, 27 and 28. There was partially erupted and mesially inclined 26 was present and retained root piece of 55 was also seen. There was deficient alveolar ridge at the site of missing teeth. In mandibular arch missing teeth were 36, 38, 46 and 48. Both the second molars (37 and 47) were mesially tipped. There were overjet of 1 mm and 50% overbite. On habitual occlusion there were contacts of



Fig. 1: Extraoral photographs (frontal and profile view)



Fig. 2: Intraoral photographs

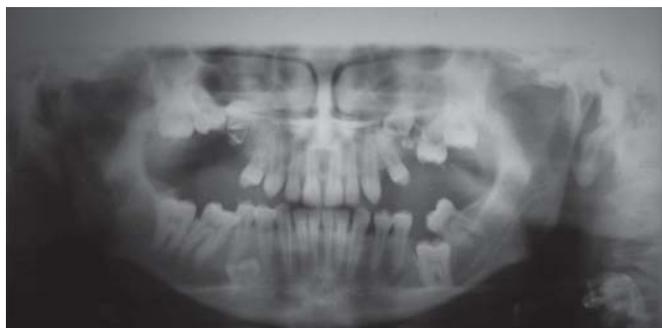


Fig. 3: Panoramic radiograph

anterior teeth only due to this there is attrition of lower anterior teeth and there was posterior open bite bilaterally (Fig. 2). The anatomy of all the erupted permanent teeth was normal. No oral mucosal lesions were found, and soft-

tissue texture and tonicity were normal. There was no evidence of syndromic abnormalities, or even milder forms such as fibrous or dense frenal attachment.

Based on panoramic (Fig. 3) and Denta scan (Figs 4A and B) radiographic examinations, multiple unerupted teeth belonging to the permanent dentition were found in both of the jaws. Five unerupted teeth in maxillary arch (15, 16, 17, 25, 27) and 3 teeth in mandibular arch (36, 46, 48) were seen on radiograph. The teeth 15, 25 and 46 were horizontally impacted and rotated, and 46 was located below the roots of 44 and 45. The teeth 18, 28 and 38 were absent. There was deficient alveolar bone over the area of unerupted teeth. There were no cystic changes and the jaw bones showed normal trabecular pattern and density. There were normal skeletal growth pattern and skeletal relationship on



Figs 4A and B: Denta scan



Fig. 5: Lateral cephalogram

lateral cephalogram analysis (Fig. 5). In the view of impactions of permanent teeth, complete blood examination and routine biochemical test including serum alkaline phosphatase assessment was carried out to rule out any syndromes and systemic disorders. The results of these tests were found to be within normal values.

DISCUSSION

Eruption is the axial movement of a tooth from its nonfunctional position in the bone to functional occlusion. It is a physiologic process that strongly influences the normal development of the craniofacial complex. The normal eruption of deciduous and permanent teeth into the oral cavity occurs over a broad chronologic age range. True and significant deviations from accepted norms of eruption time are often observed in clinical practice. Premature eruption has been noted, but delayed tooth eruption (DTE) is the most commonly encountered deviation from normal eruption time.⁹ Often, DTE might be the primary or sole manifestation of local or systemic pathology. A delay in eruption can directly affect the accurate diagnosis, overall treatment planning, and timing of treatment for the orthodontic patient. Thus, DTE can have a significant impact on a patient's proper health care.⁹

Multiple impacted teeth itself is a rare finding and often found in association with syndromes, such as cleidocranial dysplasia, Gardner's syndrome, Zimmerman-Laband syndrome and Noonan's syndrome.^{2,9} In the present case, apart from multiple impactions of permanent teeth, no other feature of any disorder was diagnosed exactly. Multiple impacted teeth with no obvious etiology are a rare dental anomaly.⁶⁻⁸

Delayed or arrested eruption is probably caused by diminished resorption of bone and of primary teeth and to the presence of multiple supernumerary teeth. Lack of space

or crowding of teeth in dental arches and rotation of tooth buds are some of the most common causes contributing to impaction. In other cases, the normal number of permanent teeth is present and the failure to erupt is caused by loss or lack of the eruptive force.^{1,10} Conditions which cause lacking of eruptive force in such cases could be due to either general, endocrinal, neurogenic and mucosal or bone disorder. The exact cause and the significance of multiple impacted teeth remain an enigma to a clinician. In the present case, it seems that lack of eruptive force in combination with defective development of alveolar bone might have resulted in multiple impactions of teeth. Dental history and radiographic examination excluded partial anodontia, and the medical and family histories and physical examinations did not suggest a syndrome or ametabolic disorder.

Flaws in the eruption process have genetically distinct etiologies with several different eruption phenotypes. The localization of the genetic defect in the eruption phenotype of failure of eruption is largely unknown. Only for the condition of osteopetrosis with failure of tooth eruption is the genetic defect TRAF⁶ delineated.⁹ Hence, further characterization of distinct human tooth eruption phenotypes with the corresponding causative mutations should provide clues about how single genes interact in a common pathway. To ensure that tooth eruption occurs in a timely fashion, a set of molecular signals must be generated locally to initiate and regulate eruption of each tooth. Which molecules are needed, where they are produced, and what cellular events they trigger are critical to understanding the molecular biology of eruption. The data from recent studies hypothesize that a reduction in secretion of the osteoprotegerin protein at defined times might promote the osteoclastogenesis and alveolar bone resorption needed for eruption, and this down-regulation of osteoprotegerin protein is mediated by CSF-1. Bone morphogenetic protein-2 down-regulates RANKL (receptor activator of nuclear factor kappa-B ligand) expression *in vitro* and *in vivo*, and might promote alveolar bone growth in the basal region of the tooth.^{11,12}

The early diagnosis and management of the case is very important to prevent morbidity. Interdisciplinary management is essential in these cases for optimal outcome to restore function and esthetics. A variety of treatment options are available to the dentist for oral rehabilitation of these patients.^{13,14} These include observation, surgical removal of hard and soft tissue obstructions, surgical uncovering and orthodontic repositioning. If any unerupted tooth do not erupt even after the surgical opening and orthodontic traction procedures, that tooth needs extraction followed by prosthetic replacement. With the advent of new

designs in dental implants and their abutments, it is possible to consider replacing missing teeth with implant borne prosthesis after extraction of the impacted teeth. So, intervention by oral surgeons, periodontists, orthodontists and prosthodontists are warranted, as par concerned problem and treatment plan.

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