COMPREHENSIVE REHABILITATION OF MULTIPLE APLASIA: A CASE REPORT

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ABSTRACT

Multiple aplasia (oligodontia) is a condition characterized by congenital absence of six or more permanent teeth. It is primarily of genetic etiology. Absence of permanent teeth leads to multifarious problems such as increased attrition, caries, abnormal proximal contacts, underdeveloped alveolus and severe deep bite. This necessitates a multidisciplinary rehabilitation protocol, consisting of restorative, orthodontic, surgical and prosthetic components. This paper reports the management of oligodontia in a 13-year old child with was treated by multidisciplinary approach. The unique clinical issues related to the condition such as the need to maintain the deciduous teeth, the root-filling material, placement of interim dentures and need to strengthen the existing teeth, have been highlighted.

Key Words: Multiple aplasia; MTA; Pulpectomy; Resorption.

Introduction

The increased oral health awareness among population of the modern era has sought more attention and demand towards cosmetic dentistry. The prospect of a complete and well-maintained set of dentition is within the reach of many more individuals. Numerous dental borne diseases have been identified leading to unfavorable changes in the affected person’s dentition. These include alterations in the tooth number, shape, size and structure. While most dental anomalies can severely impair the quality of life in patients, they are not fatal.1

The development of teeth is regulated by inductive interactions between epithelial and mesenchymal cells and is under strict genetic control. More than 200 genes are known to be expressed during tooth development.2,3 Evidence supporting a genetic etiology for tooth agenesis is well established. Tooth agenesis usually presents as an isolated anomaly. However, it is known to occur in association with syndromes or inherited disorders; many of which have known genetic defects. While the genetic factors underlying some of these conditions have been identified, the vast majority of them still remain only partially understood.4 Oligodontia is a condition that presents with the congenital absence of six or more teeth excluding the third molars. The prevalence varies from 0.25-0.7%.5,6 This clinical report describes the multi disciplinary approach towards rehabilitating a young patient with non syndromic oligodontia.

Case Report

A 13-year old girl born to parents in consanguineous marriage reported with the complaint of retained primary teeth. The medical history was non-contributory. The general examination of the patient did not show any abnormality or syndromic manifestations.Intra-oral examination revealed erupted permanent maxillary centrals, mandibular first premolars and maxillary and mandibular first molars. The remaining dentition consisted of primary teeth with a missing left maxillary lateral incisor (Figure 1,2). There was marked attrition of the retained deciduous teeth and grade I mobility of the deciduous mandibular incisors and mandibular left second molar. Other findings included deep bite, a midline shifted to left by 2mm and obvious spacing between the teeth (Figure 3). An orthopantomograph was ordered, which showed that permanent successors of the retained primary teeth were not present (Figure 4). The patient had a total number of 20 missing permanent teeth excluding the third molars. Thus the child was diagnosed to have generalized oligodontia. A comprehensive treatment plan was formulated and the informed written consent was obtained from the parents. As the primary teeth had to be retained, an intentional root canal treatment with a non-resorbable material was advocated. In this case the material used was Mineral Trioxide Aggregate (Pro Root MTA, Dentsply, Tulsa, OK, USA). The teeth that were root canal treated included the retained deciduous mandibular incisors, the maxillary first and second molars and the mandibular right second molar. The pulpectomy was followed by the placement of stainless steel crowns for the posteriors in order to withstand the occlusal forces (Figure 5,6). The generalized attrition of the retained primary teeth was found to produce a reduction in the lower anterior facial height resulting in deep bite occlusion. To counter this, the vertical dimension was increased by 1-1.5 mm with the placement of stainless steel crowns. As a part of our treatment plan the extraction of grossly destructed deciduous mandibular left second molar was carried out, and was rehabilitated by the placement of a removable, functional space maintainer (Figure 6). The other decayed maxillary and mandibular primary incisors that compromised esthetics were restored with nano ceramic composite (Mono M3, Ceram X, Dentsply) (Figure 7). Instructions regarding the maintenance of good oral hygiene and importance of periodic dental visit at 6-month intervals were also conveyed.

Discussion

Multiple aplasia (better known as oligodontia) is a condition that presents with six or more missing permanent teeth excluding the third molars.3,4 Oligodontia can occur either in association with syndromes or as a non-syndromic familial trait or as a sporadic finding. It has been an integral part of more than 120 syndromes the most frequent ones being Reiger’s syndrome, oto-palato-digital syndrome and oto-facial-digital
syndrome.6,5

Several cases where a single gene mutation is associated with oligodontia have been described in the literature. Studies have shown that mutations in the homeobox gene MSX1 and PAX9 transcription factors cause human autosomal dominant tooth agenesis and oligodontia.2,3 These are expressed in the dental mesenchyme at the stage of initiation of tooth development. Individuals with MSX1 associated oligodontia have typically missing maxillary and mandibular second premolars and maxillary first premolars.1 More than 80% of the individuals with PAX9 associated oligodontia are seen with missing maxillary and mandibular second molars.2 These evidences point clearly towards a genetic etiology for the entity. The practice of consanguineous marriage, prevalent in certain communities in rural India, presents a high risk of expression of these disorders in the offspring. Although certain investigations suggest that oligodontia is genetically conditioned, this does not exclude the presence of external and internal factors like radiotherapy, infectious diseases, traumas, endocrine and intrauterine diseases.5

Indeed early diagnosis is essential to the development of treatment strategies needed to manage the continuum of continued growth and development and varying esthetics and functional needs of the patient until growth is complete and definitive restorations are placed.6 The role of the dental team is to maintain the existing dentition, improve the esthetics, improve speech, promote psychological and emotional well-being and finally improve acceptance by family and peers.7 Restorative problems encountered in patients with congenital absence of many teeth reflect the quality of available alveolar bone and occlusal disturbance. The absence of teeth is often associated with a reduction in both the height and quality of the bone of the alveolar process. Preservation of alveolar bone by retaining primary teeth is clearly advantageous. But this may be compromised by the rapid wear of opposed primary teeth and an unpredictable rapid root resorption at times despite the absence of permanent successors.6

Retained primary teeth that have no permanent successor present a unique challenge. These teeth are often prone to caries because of factors such as length of time in the mouth and interproximal contact discrepancies with permanent teeth and thinner enamel than permanent teeth. The primary molars often have large pulp horns that may result in early pulpal involvement. If such a primary molar becomes pulpally involved root canal therapy with a nonresorbable obturation material and an appropriate restoration are the viable treatment options to maintain occlusal function and arch integrity.8 Considering this fact, intentional root canal therapy was performed in the seven of the retained deciduous molars and four mandibular incisors.

The obturating material needs to be chosen with care. Many papers have highlighted the exceptional properties of mineral trioxide aggregate (MTA) in this regard. MTA has excellent properties of biocompatibility, superior seal and ability to set even in the presence of moisture.9,10 It is not recommended for obturating primary teeth with permanent successors as it is absorbed very slowly, if at all.11 However MTA has proved to be a successful material in treating primary molars with no permanent successors, as in the case of multiple aplasia.

There are also a variety of orthodontic problems that invariably depend on the number and type of teeth that are missing. Attrition of the lower primary incisors and the associated eruption of maxillary incisors is a common finding. The resulting occlusion may be associated with a deep overbite, decreased interocclusal space, reduced height of the lower third of the face and loss of medial line. This in addition to large spaces where teeth are missing may be a cause of concern about appearance.6 Thus considerable innovation is required in orthodontic treatment planning. An increasing concern about appearance is common in teenage patients and a simple partial denture can effect a considerable improvement. Modifications to the existing denture or their replacement will be required as the patient grows.6,11

Conclusion
The congenital absence of teeth can seriously disable a young person both physically and emotionally, especially during the turbulent years of adolescence. In patients with congenital absence of teeth, prompt and accurate diagnosis is necessary and careful planning of treatment with a preconception of the final solution is required. This can be achieved only by an interdisciplinary approach. True interdisciplinary working involves the close working of a committed team where each member contributes their expertise to achieve an optimal outcome for the patient.5,7

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