

Prosthodontic Management of True Generalised Microdontia in Pituitary Dwarfism – A Case Report

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Abstract: Abnormalities in size & number of teeth are occasionally recorded in clinical cases. True generalized microdontia is a rare case in which all the teeth are smaller than normal. True generalized microdontia markedly influence on physical, functional & psychological maturation of the affected individual. Thorough evaluation, proper counseling & careful treatment planning employing a multidisciplinary approach are keys to a successful, long-term management. This is a unique case report of non-syndromic association of genetically inherited true generalized microdontia in a family.

Key Words: True generalized microdontia, Microdontism, Pituitary Dwarfism, Prosthodontic management.

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I. Introduction

Microdontia is a developmental alteration in size of teeth and considered as abnormally small sized teeth. It is classified into true generalized microdontia in which all the teeth are smaller than normal, relative generalized microdontia in which teeth appears small in large jaw and microdontia involving single teeth¹. The etiology of microdontia varies involving both genetic and environmental factors. The growth hormone deficiency due to pituitary dysfunction is the most common condition results in true generalized microdontia². The small teeth in the jaw create esthetic, functional and psychological problems to the patient. The objectives in management of such patients needs proper diagnosis and careful treatment planning, involving other concerned specialties, so that the results can be significant in improvement in speech, mastication, and facial aesthetics, thus, contributing to the development of normal dietary habits, and improved social integration of these patients.

II. Case Report

A 15 year old girl referred from his general dental practitioner with chief complaints of missing anterior tooth & small sized existing teeth. The patient was well-educated and aware of her problem for which she had consulted many general dental practitioners. She appeared to be psychologically depressed, reluctant and lacked confidence in moving around in her society. Her mother is also affected with small teeth same as her daughter. Similar history was positive in her maternal relatives with cousin marriages for the last generations.

The patient is short in stature, height less than 4.5 feet for her age. Upon examination of the limbs, hands, skin, hair, nails & eyes were all appeared normal. No abnormality was noted in neck, back, muscles, cranium & joints as well. Intellectual & scholastic performance was also normal. On blood investigations, endocrinological report shows growth hormone deficiency.

The intra-oral soft tissues were healthy, but the teeth were abnormal in size & shape with missing upper right central incisors. (Fig-1, Fig-2 & Fig-3). The patient had normal occlusion with spacing between the teeth.

Overall, the dentition was smaller than that of the average adult. Orthopantomogram reveals short clinical crown & conical roots. (Fig-4).

Figure 1:Pre-operative - Right lateral view



Figure 2 :Pre-operative - Facial view



Figure 3: Pre-operative - Left lateral view



Figure 4: OPG reveals short clinical crown & conical roots



Patient was given a detailed overview of the condition & all treatment options were discussed.

Prosthodontic Management:

Conventional fixed partial denture requires abutment preparation which leads to destruction of adjacent teeth. Hence minimal abutment preparation bridges planned in this patient, so called Rochette Bridges constructed for missing upper right central incisor. Minimal abutment preparation includes palatal reduction of 1.5mm with supragingivalschamfer finish line with round end tapered diamond bur on 12 & 22 with maximum conservation of tooth structure.

In this Rochette bridge, wing-like retainer with multiple flared perforations to provide mechanical retention for resin cement (Fig-5& Fig-6). It involves replacing teeth by attaching pontics to thin metal retainers, which are bonded to the palatal surface of the abutments using resin cements which provides combined mechanical retention with a silane coupling agent to produce adhesion to the metal. The retention to metal formed the basis of development of this prosthesis. Finally, fixed dental prosthesis is luted to prepared abutment teeth, primarily enamel, which has been etched to provide macromechanical retention for the adhesive resin cement that chemically bonds to enamel and alloy has helped to increase the rate of success of resin-bonded bridges.

Figure 5: Post-operative - Rochette bridge - Palatal view



Figure 6: Post-operative - Rochette bridge - Facial view



III. Discussion

True generalized microdontia, though not a life-threatening condition, can have great impact on the physical, intellectual & psychological maturation of the patient. Both genetic & environmental factors are involved in the complex etiology of microdontia³. Since the patient is the only child, the presence of consanguinity in the form of both parents could suggest recessive or polygenic inheritance⁴. Irrespective of small teeth the patient is not having other physical or mental deformities which ruled out the syndromic conditions.

On the basis of visual documentation, the patient in the current case seems to have been more severely affected in all his teeth exhibited aberrant morphology and all were smaller than normal. Resin bonded bridges and implant supported prostheses are the preferred definitive restorative option for majority of the microdontia patients⁵. Removable partial dentures can usually restore appearance and function, particularly as an interim measure. Due to absence of upper right central incisor, there was lack of sufficient bone for reliable implant placement. This might be due to localized or generalized decrease of growth stimuli of the jaw bone.

One of the major advantages of resin-bonded bridge is that it requires minimal tooth preparation than conventional bridgework, with other authors advising no preparation at all⁶.

Resin bonded bridges are classified into different types namely Rochette bridge, Maryland bridge, Cast Mesh bridge and Virginia bridge. A Rochette bridge is a type of dental prosthesis introduced in the year 1970s, and described by Alain Rochette in 1973 as a form of resin retained bridge^{6,7}. Resin bonded bridges are useful in treating young patients. Three fundamental principles are required to achieve predictable results with Resin bonded bridges are proper patient selection, correct enamel modification and framework design. The indications of Resin bonded bridges includes replacement of missing anterior teeth in children and adolescents, caries free abutment teeth or unrestored abutments, mandibular incisor replacement, single posterior teeth replacement, short span bridge and significant clinical crown length. The limitations of Resin bonded bridges are weakening of the metal retainer by the perforations, exposure to wear of the resin at the perforations and limited adhesion of the metal. In majority of the patients, the gingiva was healthy and reported 98.8% patient satisfaction with a viable fixed partial prosthesis in selected cases to construct resin bonded bridge⁸. As preparation are more confined to the enamel, they may be undertaken without the use of local anesthesia, which further decreases stress and dental anxiety in patients⁹.

IV. Conclusion:

Young patient with true generalized microdontia need early referral to the dental specialist for optimal management. Optimization of the spaces orthodontically combined with composite additions, resin retained bridges, veneers, onlays & tooth transplants contribute to an improvement in aesthetics & functions for the treatment of microdontia. But in financial constraint the resin bonded bridges are good alternate choice fixed prosthodontics. If resin-bonded bridges are used in appropriate clinical situations, this sort of treatment modality can be extremely successful, since chair side and laboratory time are less than for conventional bridges and hence resin-bonded bridges are usually cost effective.

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