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Case Report



Full mouth rehabilitation of severely worn out deciduous dentition in conjunction with crown lengthening procedure: A case report

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Abstract

In order to restore severely attrited deciduous teeth, surgical intervention in the form of a crown-lengthening procedure may be required. And also, proper diagnosis and treatment sequencing is critical to obtain a successful results. Adequate diagnostic wax-up ensures good esthetics and healthy periodontal tissue. This clinical case report describes a diagnostically based protocol for restoration on deciduous dentition with crown lengthening procedure and full mouth rehabilitation with porcelain fused to metal, metal and composite crowns.

Keywords: *Deciduous Dentition, Diagnostic Wax Up, Full Mouth Rehabilitation, Surgical Crown Lengthening.*

1. Introduction

Hopeless retained primary teeth without permanent successors are a restorative challenge for clinicians and cause clinical problems for patients. Compromised esthetics, shifting of adjacent teeth, altered occlusion, and supra eruption of teeth is among the problems that can occur when a permanent tooth is congenitally missing (de Oliveira et al. 2009). While various treatment approaches for congenitally missing teeth have been proposed, outcome data pertaining to these treatment options are lacking (Haselden et al 2001). Using existing primary teeth as abutments and rehabilitating the entire arch is one such procedure which can enhance the es-thetics, function, comfort and in turn boost the self-esteem of the patient. These advantages of retaining the deciduous dentition and use them as abutments include preservation of the alveolar crest and prevent resorption of the alveolar bone, psychological advantage of having the teeth retained, avoidance of usage of removable prosthesis after extraction, cost and the surgical procedures involving implant placement and subsequent restoration.
However there are various challenges involved in restoring the deciduous dentition. The gradual wear of the occlusal surfaces is a frequent finding seen in the retained dentition. Excessive occlusal wear can result in pulpal pathology, occlusal disharmony, impaired function, and esthetic disfigurement (Song et al. 2010) and more importantly reduced crown height. A short clinical crown is defined as any tooth with less than 2 mm of sound, opposing parallel walls remaining after occlusal and axial reduction. The common causes of short clinical crown include caries, erosion, tooth malformation, fracture, attrition, excessive tooth reduction, eruption disharmony, exostosis and genetic variation. When restoring a short clinical crown, the clinician may attempt to gain length by placing a subgingival margin (Seol et al. 2010). However, deep subgingival margins that encroach upon the biologic width jeopardize the periodontal tissue and are therefore not desirable. Few authors suggest (Davarpanah et al. 1998, Assif et al. 1991) the therapeutic modalities which include surgical lengthening of clinical crowns, forced eruption of teeth, altering tooth preparation design and foundation restorations.
This clinical report demonstrates the treatment sequence of restoring retained deciduous dentition of a 26 year old female patient with full mouth metal ceramic crowns after crown lengthening utilizing electrocautery.

2. Case Report

In this case, 26 year old woman patient visited the hospital complaining of unsatisfactory appearance. Examination revealed retained deciduous dentition with extremely short clinical crown length [Fig. 1]. The crown-to-root ratio was about 1:3. In clinical examination, attached gingival band was 4 to 5 mm width, and periodontal pocket depth was 3 mm or less. Neither periodontal problem nor tooth mobility was detected.
Based on the examination as mentioned above, the treatment plan was established. All teeth were planned to have a surgical crown lengthening procedure of 4-5mm extension as determined by diagnostic wax-up. Teeth were planned to be restored as a single unit long span bridge for each side of the maxillary and mandibular arch. For missing teeth, patient was suggested the implant installation but she denied the suggestion on account of economic problem. As an alternative a bar was planned to be fabricated running across the edentulous ridge connecting the mesial and the

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distal abutments and composite could then be used to build up the tooth on the bar and the pontics kept nonfunctional to minimize any extra load on the deciduous abutment teeth.
Crown lengthening of 4-5mm was achieved using electrocautery and frenectomy was performed on upper labial frenum because of its very low attachment [Fig. 2].



Fig. 1: Pre-op View

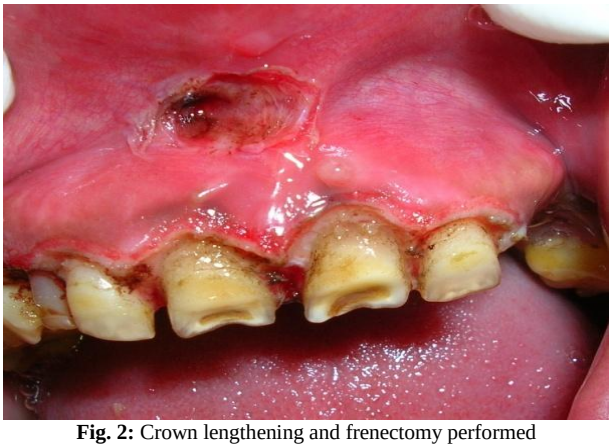


Fig. 2: Crown lengthening and frenectomy performed

After healing was complete, impressions were made and the casts were mounted on a semi-adjustable articulator using a face-bow record and an interocclusal record that was made with the aid of a Lucia jig and poly vinyl siloxane occlusal registration material. As there was clinical evaluation of reduced VDO, full mouth rehabilitation with increasing VDO was planned. The new VDO was set by 5 mm increase in the incisal guidance pin of the articulator. The splint was designed to offer bilateral contacts of all posterior teeth in centric relation and guides of the anterior teeth in excursive movement. The adaptation of patient to the increased VDO was evaluated during 1-month trial period. No muscle tenderness and temporomandibular discomfort was found. The method of increasing VDO with the splint was used to determine desirable VDO of the fixed interim prostheses. After taking CR record using Lucia jig and wax-rim, diagnostic wax-up was performed. Autopolymerizing acrylic resin provisional crowns were fabricated using a vacuum formed matrix that was produced from the diagnostic wax-up. The provisional fixed restorations were cemented with temporary cement, and the patient's adaptation was monitored.
For three months, interim restorations were adjusted, and used as a guide for the definitive oral rehabilitation. During this period, the patient's condition and functions, such as muscle tenderness, discomfort of TMJ, mastication, range of the mandibular movements, swallowing, and speech, were evaluated. Improvement in mastication, speech, and facial esthetics confirmed the patient's tolerance to the new mandibular position with the restored VDO. The anterior guidance and posterior disclusion on excursive movement were established. Adjusted occlusion was transferred to customized anterior guide table, which was made with acrylic resin. Final preparation was performed, and definitive impressions were made with poly vinyl siloxane impression material. Bite registration were made using occlusal registration material. Wax patterns were made [Fig. 3], casted and porcelain fused to metal restorations were given for anteriors while premolars were given porcelain facing and full metal crowns for deciduous molars.

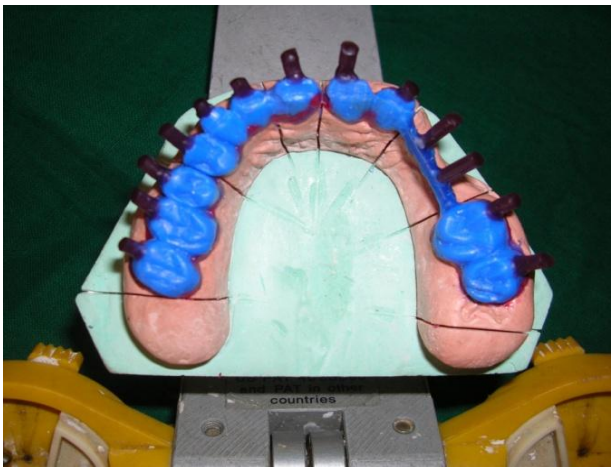


Fig. 3: Wax patterns sprued

Metal bar was fabricated connecting the deciduous left lateral incisor to the deciduous first molar and composite crowns were built on them for esthetics [Fig. 4].



Fig. 4: Castings with the metal bar

Restorations were made using customized anterior guide table and cemented with glass ionomer cement [Fig. 5].

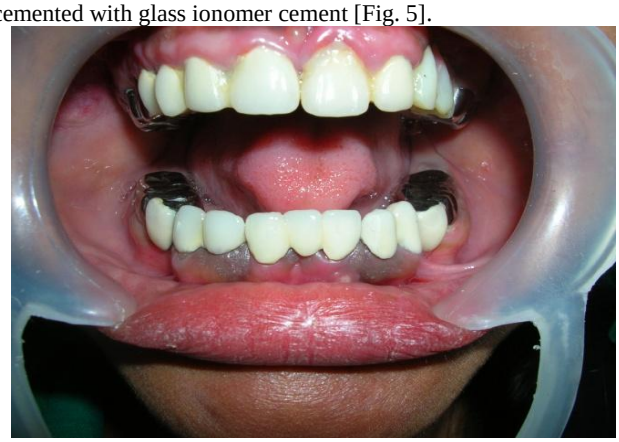


Fig. 5: Restorations cemented in place

The prostheses were designed using mutually protected occlusion. The anterior teeth protected the posterior teeth from excursive force and wear, and posterior teeth supported the bite force. Oral hygiene instruction and regular check-up were administered. At 3

year follow, patient reported satisfactory mastication, speech, comfort and facial esthetics [Fig. 6].



Fig. 6: Post-op View (3 year follow up)

3. Discussion

The complications of using a deciduous dentition as abutment teeth and using teeth with short clinical crown demand a circumspect treatment plan and proper sequencing of therapy to ensure an optimal result for both the patient and the clinician. Proper treatment sequencing is critical when a patient requires multiple fixed restorations (Seol *et al.* 2010).

In 1984, Turner classified the treatment of a severely worn dentition by the amount of the loss of VDO and available space to restore. His classification and conventional treatment, which includes raising VDO with multiple crown-lengthening procedures, have been widely used up to present (Turner & Missirlian 1984). The vertical dimension, centric relation, and occlusal plane must be determined first, followed by a diagnostic wax up which is essential for fixed prosthesis. An accurate diagnostic and interdisciplinary approach is necessary for obtaining improved, conservative and predictable results (Seol *et al.* 2010).

Lack of evidence regarding the long-term outcomes of treatment in deciduous dentition cause difficulty in clinical decision-making. Therefore, the conventional treatment modality that includes a trial overlay splint, provisional restoration, careful monitoring, and definitive prosthesis, was chosen. Nonetheless, the composite resin restoration on a metal bar connecting the two abutment teeth was used as pontic to replace the missing teeth for the patient in this case to reduce the load on the abutments. The rehabilitation of deciduous dentition using crown lengthening and fixed restorations can be a common and convenient treatment plan for many patients who desire rehabilitation.

4. Conclusion

In this clinical report, lengthening deciduous crowns and raising vertical dimension of occlusion using removable occlusal overlay splint and following fixed provisional based on accurate diagnosis showed successful full mouth rehabilitation for severely worn down deciduous dentition.

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