OVERLAY DENTURES: A REVIEW AND REPORT OF FOUR CASES

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Abstract

Patients with ectodermal dysplasia or having undergone cleft surgery with anodontia or hypodontia, hypoplastic conical teeth and patients with severely worn dentition are difficult to treat because of the poor remaining tooth structure. These patients often exhibit loss of vertical dimension of occlusion and aesthetic problems and usually need complex prosthetic treatments. Financial constraints or other priorities often restrict one from choosing the most desirable treatment. The overlay removable denture is a covering prosthesis partially supported by natural teeth, tooth roots, or dental implants, providing an efficient alternative of treatment. Clinical reports describe the various applications of overlay dentures.

Keywords: overlay denture, onlay denture, removable denture, ectodermal dysplasia, cleft palate

Patients afflicted with developmental/congenital orofacial anomalies address the prosthodontist with unique aesthetic and functional restorative challenges [1,2]. Such anomalies are frequently associated with partial anodontia (congenital absence of one or more teeth), which is a significant challenge for the restorative dentist. Depending on the severity of the dental problem, various prosthodontic treatments are available to improve the aesthetic aspect, mastication and speech [1,3].

Well-supported teeth with relatively normal anatomy can be restored with a fixed partial denture, with excellent results. Unfortunately, many patients with partial anodontia have small, tapered, conical teeth which do not permit crown preparation [1]. Further on, this condition may be associated with the ectodermal dysplasia syndrome, where deciduous teeth are often retained into the third decade and the teeth of permanent dentition are frequently small, conical, and tapered towards the coronal surface [4]. The underdeveloped alveolar bone and reduced form of the teeth in partial anodontia often result in depressed premaxilla, compromising the soft-tissue profile of the patient, which can be significantly improved by a removable denture. Lack of alveolar growth frequently results in increased interocclusal distance, which allows optimum artificial tooth placement [1,2]. The deficiency in alveolar bone may further prevent the prosthodontist to place implants in the region.

The use of removable partial dentures (RPDs) is a reversible treatment that can significantly improve the function and aesthetics, without jeopardizing compromised dentitions [5,6]. The overlay RPD is a covering prosthesis partially supported by natural teeth, tooth roots, or dental implants [6]. Telescope dentures [7], overdentures [8], tooth-supported complete dentures [9] are some of the other names used to describe overlay dentures [10], recommended for effectively treating patients with a reduced number of teeth [6,7] (oligodontia or partial anodontia) or with altered teeth (congenital/developmental due to tooth wear).

Long-term observations made on most of the patients requiring a definitive prosthesis for oral rehabilitation have confirmed that moderate alterations to the occlusal vertical dimension (VDO) may be well-tolerated. It is commonly believed that changes of VDO should be conservative and that a carefully monitored trial
period with an interim prosthesis is desirable. Transitional removable partial dentures (RPDs) at the desired VDO, acrylic splints, or provisional restorations appear as recommended techniques. As the treatments may be expensive and time-consuming, it is preferable to use a prosthesis that does not permanently change dentition during the assessment period [11]. In such situations, an overlay denture may be an effective intermediate option.

A variety of theories and techniques have been reported for using natural teeth to support and stabilize overlay removable dentures. [10] The present study discusses a simple technique for obtaining a removable overlay denture, in order to regain its appropriate functions, aesthetics, comfort and psychological advantage of retaining natural teeth in patients with congenital anomalies associated with partial anodontia, yet without jeopardizing the existing teeth.

The procedure involves surveying of master casts to determine the most suitable path of prosthesis insertion, followed by mounting of diagnostic casts in a semi-adjustable articulator by means of face-bow, muscle deprogrammer and centric relation records. The physiological rest position, determined by facial measurements and interocclusal distance, was subsequently confirmed by phonetics, swallowing methods and aesthetics. After careful assessment, the planned alteration in VDO was determined clinically by transferring a polysiloxane record fabricated on the articulated diagnostic casts at a predetermined vertical dimension. Teeth were trimmed in the form of laminates and Overlay RPD was waxed up and then acrylized with a heat-polymerizing acrylic resin. The metal framework was incorporated in the denture covering the existing dentition, to reinforce it against the forces exercised by the opposing natural dentition. Accurate surveying ensured easy insertion with minimal corrections. Additional visits were needed to refine the occlusion of the provisional restorations, so that they would harmonize with the natural occlusion. The patients were educated to maintain a proper oral hygiene.

**CASE REPORTS**

**Case 1. Ectodermal dysplasia with partial anodontia**

A 26 year-old man presented with the chief complaint of poor dental aesthetics and mastication. Medical and dental histories, cleft palate surgery at the age of 4 years, were recorded. The patient, who did not receive comprehensive dental care in the past because of financial constraints, exhibited typical characteristics of hypohydrotic ectodermal dysplasia, including protruding forehead, saddle nose, fine, sparse hair, and partial anodontia. Intraoral examination revealed missing lateral incisors, canines and first molars in the maxillary arch, and also missing central incisors in the mandibular arch. The remaining anterior teeth and premolars were conical in shape and rotated [Fig. 1]. A panoramic radiograph confirmed the missing teeth and revealed tipping of the anterior teeth. After careful clinical assessment, a decrease of 4 mm in vertical dimension at occlusion was determined. Treatment options were discussed with the patient and a removable overlay denture treatment was planned. [Fig. 2]

![Fig 1: Pre Operative View](Image)

![Fig 2: Post Operative View](Image)
Case 2. Ectodermal dysplasia variant with partial anodontia

A 21 year-old male patient presented with the chief complaints of poor dental aesthetics and mastication. Medical history and general examination of the patient did not reveal any known disorders that would counterindicate dental treatment. Intraoral examination revealed retained deciduous dentition [Fig. 3], resulting in an insufficient growth of the alveolar bone, compromising the soft-tissue profile of the patient. A panoramic radiography revealed development of no secondary teeth or tooth germs of permanent successors. On clinical assessment, a decrease of 6 mm in the vertical dimension at occlusion was confirmed. The nature of dentition required its conservative rehabilitation, the patient being informed on the treatment necessary for preserving and restoring natural dentition. A removable overlay denture treatment was planned and fabricated [Fig. 4].

Case 3. Partial anodontia with cleft palate

A 28 year-old male patient reported with the chief complaint of missing anterior teeth and compromised aesthetics. His medical history included cleft palate surgery at the age of 4 years. Intraoral examination revealed missing lateral
incisor in the first quadrant, missing central and lateral incisors in the second quadrant and palatally-placed canines in the second quadrant [Fig. 5]. The patient confirmed that no permanent teeth had erupted in these areas. Radiographic examination revealed no unerupted teeth. Telescopic bite (full arch cross-bite) was observed in the dentition, along with a collapsed vertical dimension at occlusion, which compromised the aesthetics. A removable overlay denture treatment was planned for the patient, to provide a conservative solution [Fig. 6].

Case 4: Tooth wear prior to full mouth rehabilitation

A 55 year-old patient reported with the chief complaint of compromised masticatory function. Medical history was satisfactory and did not counterindicate oral rehabilitation. Intraoral examination revealed a remarkable degree of tooth wear [Fig. 7]. A significant decrease of 6 mm in the occlusal vertical dimension was confirmed by various methods, such as swallowing, phonetics and aesthetics; a removable overlay prosthesis was applied to assess patient’s comfort and function at increased VDO, until a definitive prosthesis - involving full mouth rehabilitation with metal ceramic crowns - could be available [Fig. 8].

DISCUSSION

Orofacial anomalies can present special challenges to the prosthodontist. A successful prosthodontic treatment of patients afflicted with congenital/developmental anomalies associated with tooth anomalies has been assured in cases of overlay removable dentures.

The overlay removable denture is a reversible and cost-effective treatment option for patients with congenital or acquired anomalies, with the final outcome of pleasing the patient [9-11]. Tooth-supported complete dentures appear as an important step in preventive prosthodontics. Preservation of the residual ridge, support and stabilization of their base, and giving patients a sense of security in knowing that teeth do support their prostheses, are the prime benefits the patients derive from the overlay denture [8]. Other advantages include those of a removable denture, *i.e.* improving the soft tissue profile and the aesthetic aspect. In the presence of sufficient interocclusal space, the overlay dentures serve as a viable option for an intermediate treatment. Moreover, sufficient denture base material is placed over these natural teeth and, usually, breakage is not a problem. However, patients may need to get adjusted to the bulk of the denture base. Speech and tongue movements may be affected until the patient gets accustomed to the prosthesis.

CONCLUSIONS

Detailed case history and intraoral examination led to the above choice of treatment for the patients mentioned in the clinical reports. Patients treated as above were recalled at 24 hr, 1 week, 3 week, 2 month intervals. The abutment teeth were of usually minimal height and
friction, and negligible wear of the tooth or denture occurred during functional movements. Patients reported improvements in chewing and speaking in addition to an enhanced aspect. The development of caries has been negligible, due to patient motivation, proper oral-hygiene instructions and use of a fluoride dentrifice.

References