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CASE REPORT

Management of Edentulous Orofacial Dyskinesia

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ABSTRACT

Edentulous orofacial dyskinesia is a rare condition, characterized by involuntary rhythmic movements of the mandible and presents an embarrassing situation for the patient. Edentulism has been considered as one of the proponents of these irregular movements, and rehabilitation of these patients with complete denture-fabrication using traditional technique restores the masticatory inefficiency and the esthetic component of the patient. Surprisingly, these movements disappear during the clinical steps of complete denture-fabrication and upon insertion of the dentures. Disturbances in the proprioception following loss of tooth may be a contributory factor for edentulous dyskinesia.

Keywords: Edentulism, Orofacial dyskinesia, Involuntary.

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INTRODUCTION

A number of movement disorders involving the facial and oral musculature are found in individuals across the globe. One of these, orofacial dyskinesia (OFD) is characterized by severe involuntary dystonic movements of these structures. Oral dyskinesia comprises of involuntary, unmanageable and abnormal movements; affecting the lips, tongue and jaws. Among the purposeless movements seen are lip-smacking, protrusion of the tongue and mandible-grimacing. This dyskinesia may appear as the sole abnormality or in combination with other movements. Orofacial dyskinesias are said to occur spontaneously in the elderly and to result from edentulousness.[1,2] They may go unnoticed or cause social embarrassment or oral traumatic injury, with speech difficulties or chewing or eating disorders. Whether they represent separate entities causing orofacial dyskinesia is not firmly established. These conditions have received only limited investigation. Diagnosis essentially relies on clinical assessment, and proper management is not always straightforward. The movements are stereotyped as they are highly patterned and predictable. The dyskinetic movements are restricted to the oral region. Edentulous orodyskinesia (ED) is a neglected source of aimless oral movements that may be confused with tardive dyskinesia (TD).

CASE REPORT

A 63-year-old completely edentulous male patient reported to the department of prosthodontics crown and bridge and implantology for replacement of missing teeth. Intraoral examination revealed normal parameters for ideal fabrication of complete denture, with good salivary flow (Fig. 1). Extraoral examination revealed loss of occlusal vertical dimension with sagging appearance of the lower third of his face, complete disappearance of the lips (cheiloptosis), and constant stereotypical

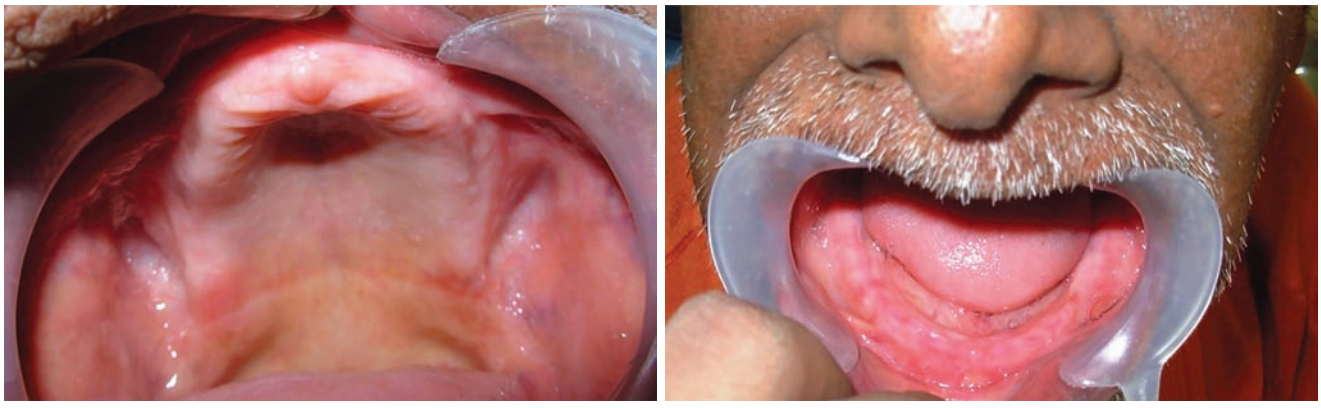

Fig. 1: Edentulous maxillary and mandibular ridges

orofacial movement of the lower jaw. Ability to keep the tongue protruded (minimum time: 30 seconds) was checked to verify the possibility of various intraoral procedures to be completed without any hindrance (Fig. 2). Surgical management with dental implants was not an option due to the financial limitations of the patient. Treatment plan included fabrication of maxillary and mandibular complete dentures for the patient by means of contemporary clinical techniques. Preliminary impressions of the maxillary and mandibular edentulous ridges were made with an irreversible hydrocolloid impression material (Neocolloid, Zermack clinical, Italy). The impressions were washed and poured with the dental plaster. Wax spacers were adapted on the primary casts and custom trays were fabricated. The custom tray was prepared with auto-polymerizing acrylic resin (DPI-RR cold cure, dental products of India, the Bombay trading corporation limited) for making secondary impression. The secondary impression was made using green stick compound for border molding (DPI pinnacle tracing sticks, Bombay, India) and zinc oxide impression paste as impression material (Fig. 3) (DPI, dental products of India, the Bombay trading corporation limited).

Fig. 2: Protrusion and other related tongue movements verified during the diagnostic phase to confirm the process of denture fabrication

(impregnum penta medium body, pearson dental supplies). Impressions were verified for accuracy and fit in patient's mouth. Beading and boxing was done and the master cast was made with dental stone type III (kalastone, kalabhai dental private limited); and wax occlusal rims were made over the temporary denture bases fabricated by auto polymerizing resin (DPI-RR cold cure, dental products of India, the Bombay trading corporation limited). Jaw relations were recorded and the maxillo-mandibular records were transferred to a mean value articulator. Teeth arrangement was done following the 'biomechanical principles of arrangement of teeth in edentulous patients'. Given the stereotypical movements, the vertical dimension component of the jaw relations was verified at the try in verification stage. Ultimately, a balanced occlusal scheme was designed in an effort to permit a definitive and maximal intercuspal position with a bilateral balance in excursive movements. Try-in verification (Fig. 4) was followed by laboratory steps of denture processing with heat polymerizing acrylic resin (Trevalon, Dentsply, Gurgaon, India), and then the processed and finished denture was inserted (Fig. 5) and evaluated for esthetics retention and function particularly due to the patient's inherent tendency of uncontrolled orofacial movements. The interferences in the denture were eliminated and denture was given to the patient. Post-insertion instructions were comprehensively explained to the patient regarding its maintenance, recall, nutrition and hygiene.

DISCUSSION

Movement disorders of the magnitude of orofacial dyskinesia generally have been considered to be due to disease of the central motor nervous system. Disruption of sensation, particularly of the proprioceptive system, in the stomatognathic complex may play an important role in the etiology of OFD.[3] There is a controversy over which of the various components of the stomatognathic complex is most important in proprioception and in the

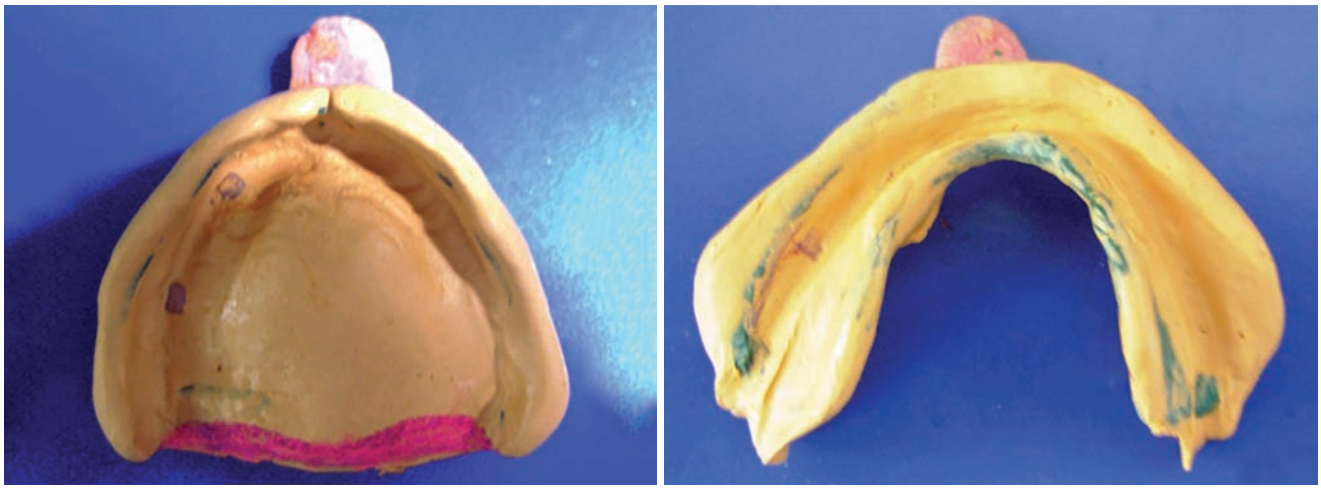

Fig. 3: Master impressions recorded with ZNO impression material

Fig. 4: Try-in verification of complete dentures

control of motion.[4-10] Partial or complete loss of sensory receptors associated with certain areas (teeth) and distortion of others (ligaments, tendons and muscles) by non-physiologic replacement parts, in all, probably combine to report improper proprioceptive information to the brain. The central nervous system must have determined sensory input to produce motor function.

The significance of the edentulous state of these patients in their abnormal muscle function has been previously overlooked. This could be due to the common misconception that loss of teeth is a normal concomitant of aging. When the teeth are lost, so are the periodontal ligaments and the rich supply of nerve endings within them. It is the loss of the periodontal proprioceptors that causes the wavering, uncertain pattern of movements in the edentulous patients. An important factor in the genesis of dyskinesia was absence of dentures in these patients. Oral dyskinesias were observed only after a long period of edentulousness, separating tooth extraction and the beginning of oral movements. In all probability with time, progressive changes occurred in the oral cavity. Inadequate dento-oral prostheses may cause disruption of dental proprioception, resulting in dyskinetic searching movements of the oral cavity. Dyskinesias associated with edentulousness do not involve involuntary protrusion of the tongue as seen in tardive dyskinesia. Patients with tardive dyskinesia can seldom hold their tongue protruded for any duration without involuntary withdrawal. Peristaltic movements of the tongue, when

Fig. 5: Right and left lateral views of the maxillary and mandibular dentures in bilateral balanced occlusion

on the floor of the mouth, do not occur in edentulous dyskinetic subjects. Involuntary movements of the upper face, limb and trunk were also absent.

It should be mentioned that attempts to establish the jaw relation at the terminal hinge position/retruded contact position failed, because the patient complained that position intolerable. When forcibly held in the terminal hinge position, the mandible resisted strongly and continuously. Instead, that mandibular position which was found to be comfortable and most effective therapeutically lay some millimeters anterior to the most retruded position. The challenge with this patient was the establishment, recording and verification of his edentulous maxillo-mandibular relationship records for mounting of the casts on articulator. His anatomical landmarks, such as paralleling of the residual alveolar ridges, measurements of the facial height, phonetics, and esthetics were helpful in determining an estimated occlusal vertical dimension; his excessive elliptical and stereotyped mandibular movement patterns made horizontal jaw relation records quite flimsy. The occlusal vertical dimension most-effective for reducing orofacial dyskinesia appears to be excessive.[11] The excessive vertical dimension of the occlusal prosthesis might improve both conscious and unconscious proprioception by stretching muscle spindles and altering the angle of the joints when the dentures are in occlusion. Considerable patience and time was necessary before a final decision could be made regarding what was adjudged to be the optimal jaw records for the patient. Given the stereotypical movements, the vertical dimension component of the jaw relations was confirmed at the trial verification stage.

Teeth selection is important criteria for the unusual movements, and semi anatomic teeth were decided for the obvious advantage of holding and guiding the mandible in the terminal hinge axis position. Finally, a balanced occlusal scheme was designed in an effort to permit a definitive and maximal inter-cuspal position with a bilateral balance in excursive movements. Complete denture is fabricated, and the teeth are placed in harmony with the individual patient's oral musculature, especially the tongue. The dyskinesia completely disappeared with proper construction of denture in this particular case. Although the relationship between the edentulous state and orofacial dyskinesias is well recognized, no other reports are available. Video recordings of the patient's mandibular movements without dentures were made with a Nikon camera and employed as a teaching and demonstration tool for both the patient and his family's benefit. The recordings showed the absence of any movement during the fabrication of complete dentures, be it recording of impressions, jaw relations or try-in and insertion of dentures. The patient, on repeated instructions to reproduce the original movements could not do so after insertion of complete dentures. Removal of the dentures was accompanied by a return to movements, which suggested that in this case, properly designed and constructed complete dentures contributed to cessation in his involuntary movements. It can, of course, be claimed that the total absence of uncontrolled movements in this patient was due to any one of the determinants of optimal complete denture treatment. The patient and his relatives were fully satisfied with the final outcome of the treatment. This particular patient's significant and discernible improvement, in what was an extremely embarrassing situation, enabled him and his family to subjectively acknowledge a far reaching improvement in his quality of life. Given this, an inference of the causal relationship between removable prostheses and edentulous dyskinesia can be drawn from the rehabilitation of this particular patient, which is lacking in literature. Nonetheless, while excessive tongue and mandibular movements are bound to compromise the denture-wearing experience, it may be argued that stable prostheses may offer a scope for spatial orientation that may, in turn, modify the TD's manifestations beneficially. The mechanism of this expected response is certainly not understood, nor is it possible to predict whether the management of this patient can be replicated in a predictable manner in other patients with similar TD signs and symptoms. Therefore, in the absence of robust evidence regarding the possible benefits of routine prosthodontic management, a case should be made for the inclusion of preventive dental programs and routine dental care as an integral part of the regimen of all patients at risk for development of dyskinesia. The condition is medically mandated, but the dental clinician may very well be the first health professional to identify the uncontrolled movements that may suggest TD, especially those involving the orofacial complex. A frank discussion with the patient and referral to his or her physician can lead to an early diagnosis and effective management of this movement disorder. Above all, edentulism should be prevented whenever possible, while research into the validity of implant-supported/retained prostheses for such patients may prove to be an important new direction in the discipline. Dental treatment for these patients is highly individualized and no standard treatment is available. The knowledge and empathy of the clinician are critical elements in the management of dyskinetic patients.

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