

## CASE REPORT

# IMPACT OF PROSTHODONTIC TREATMENT ON THE ORAL HEALTH RELATED QUALITY OF LIFE IN A MAXILLECTOMY PATIENT WITH MULTIPLE IMPAIRMENTS

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Oral Health Related Quality of Life is an important component in the treatment of a patient. Patients with multiple impairments have a compromised quality of life, which is further worsened by ablative maxillary surgery. A properly made oral prosthesis aids in the daily life functions and therefore, has a positive impact on the quality of life of the patient. This article discusses a case in which prosthodontic treatment improved the Oral Health Related Quality of Life in a maxillectomy patient having multiple impairments.

**Keywords:** Quality of life, Oral Health Related Quality of Life, maxillectomy, multiple impairments, palatal obturator

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## INTRODUCTION

Quality of life (QoL) is a broad term including social, political and health related aspects.<sup>1</sup> WHO states: "health is a state of complete physical, mental and social well being and not merely the absence of disease or infirmity."<sup>2</sup> Health Related Quality of Life (HR-QoL), therefore, is one dimension of a wider concept of QoL and is defined in relation to optimum levels of mental, physical and social functioning.<sup>3</sup> OHR-QoL is part of the quality of life that is affected by oral health and function.<sup>4</sup> It includes functional factors, psychological factors, and experience of pain/discomfort in relation to oro-facial concerns.<sup>5</sup> Head and neck lesions, such as mucormycosis, that lead to necrosis and destruction of the involved structures, are undoubtedly related to a decrease in HRQoL.<sup>6-8</sup>

Restoration of maxillectomy defects aims to rehabilitate the lost functional as well as psychological factors of OHR QoL and hence attempts to improve the OHR QoL. This report discusses the impact of prosthodontic treatment on the oral health related quality of life of a maxillectomy patient with multiple impairments using the OHIP-14 questionnaire.

## CASE

A 49-year old female patient, accompanied and assisted by an attendant, reported in the Prosthodontic clinic, at Fatima Memorial Hospital, Lahore, with the chief complaint of nasal regurgitation, loose, ill-fitting, and unstable maxillary obturator.

A thorough history revealed that, three years ago, the patient reported to the Oral and Maxillofacial Department with pain and hemi-facial paralysis. She was diagnosed of having rhino-orbital mucormycosis and a maxillectomy was performed, leaving a large defect. Past medical records revealed that the patient had multiple medical problems. She was diabetic and hypertensive; but stable, with medication. She had a

history of cardiovascular accident and also suffered from infections of the eye, ear and urinary tract.

Her dental records revealed that the patient had had two obturators after maxillectomy. No immediate post-operative oral prosthesis was provided. The first obturator was provided to the patient after twenty days post-surgical. It was adjusted several times for looseness to address the patient's complaint of "nasal regurgitation". In spite of this existing problem, the patient wore it for six months with no respite.

The present obturator (Figure-1) was the second one which the patient was wearing for the last two years and four months. Patient complained of the same problem of unstable, loose oral prosthesis and of nasal regurgitation. On multiple occasions it was relined by direct and indirect techniques with no satisfactory results. The maxillectomy adversely affected the patient's psychological state. After two years of surgery, she suffered from mixed anxiety and depression which later on progressed to paranoid schizophrenia and was treated for this condition by a psychiatrist.

At the time of presentation the patient was psychologically unstable and demoralized. She failed to follow commands and/or to communicate; her unintelligible speech, hearing disability being the main reasons. The patient was not well-oriented in time. Para-functional jaw movements and poor neuromuscular control were also observed. Intra-oral examination revealed a large central maxillary defect; involving all of the hard palate and a part of the left antero-lateral ridge, sparing the soft palate beyond the posterior vibrating line posteriorly. Soft tissues exhibited signs of inflammation. The upper arch was nearly edentulous with a right third molar present. The tooth was symptomless and firm. (Figure-2)

The lower arch was partially dentate; with the right second premolar and first molar missing. The oral and denture hygiene were poor. With the, complex

medical, psychological and oral conditions associated with this case, it was decided to reconstruct a removable acrylic obturator and assess its impact on her quality of life.

OHIP-14 (Table-1) was administered pre and post provision of an obturator. Detailed explanation of the treatment was given and informed consent taken by the patient’s attendant, as the patient was depressed and refused to communicate. Extra oral examination was carried out revealing a sunken upper lip with labial creases and pronounced lower lip. (Figure-3a and 3b) A primary impression was recorded in a perforated flanged rim locked stock tray using polyvinyl siloxane putty and a light bodied wash. Primary cast was poured in dental stone IV. Undercuts were blocked on the primary cast and a special tray fabricated in auto-polymerizing acrylic resin, using a single sheet baseplate wax spacer over the palatal area and a double sheet baseplate wax spacer over the tooth omitting the resected areas.

In the special tray a metal loop was added over the largest central bulb to aid in the retention of the impression material (Figure-4). A secondary impression was made in irreversible hydrocolloid placing the surgical gauze, tied to a string at one end, over the impression material. The impression was poured in dental stone type IV. The secondary cast was surveyed and the unfavourable undercuts were blocked after determining the path of insertion. A denture base was made using heat cure acrylic resin and wax occlusal record rims attached. Subsequent clinical and laboratory procedures followed, i.e., Jaw registration and teeth setup as for conventional complete dentures. Shallow cusped teeth were used for proper occlusion and stability.

Try-in of the prosthesis was carried out and after minor adjustments at the chair side, it was

processed. (Figure-5) Prosthesis was inserted. Post insertion instructions, for maintaining oral and denture hygiene were given. (Figure-6a and 6b) The patient was recalled for follow-up initially after 24 hours and one week and then fortnightly for two months. Patient was re-evaluated at the follow-up appointments for any minor adjustments. At the end of two months, a second OHIP-14 questionnaire was filled and responses recorded.

OHIP is one of the most sophisticated instruments to measure the OHR QoL, based on WHO classification of impairments, disabilities, and handicap and has been used in testing oral disabilities. It is a forty-nine item profile that describes the impact of oral health conditions in seven domains namely Functional Limitation, Physical Pain, Psychological Discomfort, Physical Disability, Psychological Disability, Social Disability and Handicap. OHIP-14 is the short form of the original OHIP, which addresses all the seven domains of the original OHIP and is used where the full battery of 49 questions is inappropriate.<sup>4</sup> The OHIP 14 questionnaire was used to assess the impact of Prosthodontic treatment on the OHR-QoL of this patient as this tool is validated and accepted worldwide.<sup>4,9</sup> The pre and post treatment responses of OHIP-14 questionnaire are shown in the Table-1. The responses were recorded on a 5-point Likert’s scale; never indicating the least impact and very often indicating the maximum impact. Out of the 14 OHIP questions asked before the treatment, eight were responded as “Fairly often”, five as “Very often”, and one as “occasionally”. No pre-treatment question was responded as “never”. Post-treatment responses for the OHIP-14 questionnaire were as: “never”=nine; “hardly ever” =three; “occasionally”=one

**Table-1: Pre and post-treatment responses of OHIP-14**

Dimensions	Question	Pre-treatment response	Post-treatment Response
Functional limitation	Have you had trouble pronouncing any words because of problems with your teeth, mouth or dentures?	Fairly often	Hardly ever
	Have you felt that your sense of taste has worsened because of problems with your teeth, mouth or dentures?	Fairly often	occasionally
Physical pain	Have you had painful aching in your mouth?	Fairly often	never
	Have you found it uncomfortable to eat any foods because of problems with your teeth, mouth or dentures?	Very often	never
Psychological discomfort	Have you been self-conscious because of your teeth, mouth or dentures?	Fairly often	occasionally
	Have you felt tense because of problems with your teeth, mouth or dentures?	Very often	Hardly ever
Physical disability	Has your diet been unsatisfactory because of problems with your teeth, mouth or dentures?	Very often	never
	Have you had to interrupt meals because of problems with your teeth, mouth or dentures?	occasionally	never
Psychological disability	Have you found it difficult to relax because of problems with your teeth, mouth or dentures?	Fairly often	Hardly ever
	Have you been a bit embarrassed because of problems with your teeth, mouth or dentures?	Very often	never
Social disability	Have you been a bit irritable with other people because of problems with your teeth, mouth or dentures?	Fairly often	never
	Have you had difficulty doing your usual jobs because of problems with your teeth, mouth or dentures?	Fairly often	never
Handicap	Have you felt that life in general was less satisfying because of problems with your teeth, mouth or dentures?	Very often	never
	Have you been totally unable to function because of problems with your teeth, mouth or dentures?	Fairly often	never



**Figure-1: Old obturator**



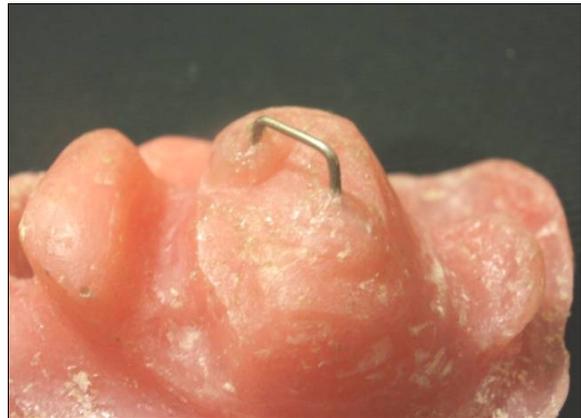
**Figure-2: Intra oral defect**



**Figure-3a: Lateral view pre-op**



**Figure-3b: Frontal view pre-op**



**Figure-4: Metal Loop on central bulb**



**Figure-5: New obturator**



Figure-6a: Extra oral profile view post-op



Figure-6b: Extra oral frontal view post-op

## DISCUSSION

Rhino-orbito-cerebral mucormycosis is an opportunistic fungal infection, occurring most commonly in immuno-compromised patients, such as uncontrolled diabetes mellitus, that results in the necrosis of the maxilla and associated structures.<sup>10</sup> After diagnosis, the surgical treatment most frequently determines a deterioration of basic

functions such as breathing, mastication, salivation, swallowing and speaking.<sup>6</sup> Impairment of senses such as hearing, taste and smell along with possible aesthetic changes and functional disabilities, promote a negative impact in the patient's OHRQoL.<sup>11</sup>

The normal psychological response to life stresses including medical illness is anxiety, while clinical depression is the final common pathway resulting from this interaction.<sup>12</sup> Maxillary resections not only adversely affect function and aesthetics but also lead to such emotional disturbances.<sup>8</sup> The above mentioned factors might be the cause of depression in the patient under discussion.

This particular patient had undergone maxillectomy in lieu of the treatment protocol for Rhino-orbito-cerebral mucormycosis. The surgical removal of the necrosed bone, created a large defect in the maxilla. Such a defect results in a communication between the oral and nasal cavities which causes difficulty in swallowing, nasal reflux, unintelligible speech, and un-aesthetic appearance. All these difficulties affect the patient psychologically<sup>11</sup> and therefore, an immediate prosthesis has to be given to such patients to lessen the psychological sufferings. This patient was not given an immediate prosthesis postoperatively and was made to wait for three weeks, thus adding to the patient's psychological distress.<sup>13.</sup>

Moreover, the patient's subsequent obturators were also not satisfactory. The obturators initially provided were ill-fitting and loose causing nasal leakage and impaired mastication. In 1996, Kornblith *et al* reported that masticatory inability in maxillectomy patients was the major reason of their depression.<sup>11</sup> Thus, the psychological trauma resulting initially from surgery, the edentulous state and later on from the impaired functions because of the faulty prostheses, might be the possible reasons of the depression and anxiety in this patient.<sup>11-14.</sup>

A Prosthodontist plays a major role in rehabilitation of such patients. Obturator prostheses are commonly used in the rehabilitation of total or sub-total maxillectomy patients, as they help in separating the oral and the nasal cavities and restore normal deglutition and speech and further improve the mid-facial aesthetics by supporting the soft tissues.<sup>15,16.</sup>

In this case attempt was made to improve the prosthesis, following all the conventional procedures of the oral prosthesis fabrication. Emphasis was placed on the intaglio surface and occlusion for improved stability of the prosthesis. The effective cusp angles were reduced in order to compensate for the poor neuromuscular control.<sup>8</sup> The reduced cusp angles reduced the occlusal interferences thus adding to the stability and hence

the overall functioning of the prosthesis. Implant-supported prosthesis was a treatment option for rehabilitating this patient as implant supported prosthesis have been reported to be more retentive<sup>17</sup> but a conventional acrylic obturator was fabricated to avoid further surgical intervention procedures and hence the resulting morbidity. Also, initial treatment with removable prostheses allows assessment of the success or failure of conventional treatment prior to consideration for implant-based treatment.<sup>8</sup> Various studies have shown that a significant number of patients can be successfully rehabilitated with conventional prostheses.<sup>18</sup>

The patient was involved and explained all the procedures and educated throughout the treatment. In 1999, Leeper *et al* reported that each session spent with the patient during the prosthodontic treatment phase is important in terms of dealing with feelings of satisfaction.<sup>19</sup> The pre-treatment functional limitations might be because of the loose, ill-fitting prosthesis which was improved by improving the occlusion and intaglio surface in the new prosthesis.<sup>8</sup> Improved post treatment response for speech was possible because of the improved stability of the prosthesis<sup>11</sup> Yoshinaka M *et al* reported that provision of dentures with improved masticatory efficiency, leads to improved taste perception<sup>20</sup>; hence the improved taste response postoperatively.

Pain and discomfort initially might be attributed to the possible formation of ulcers and epithelial abrasions as a result of the friction produced by the moving, unstable prosthesis. The post treatment response in this domain improved with the improved stability resulting from the better intaglio surface and occlusion.<sup>8</sup> The physical disability: pre-treatment lack of satisfaction regarding diet and interruption of meals might be a result of the pain and discomfort due to ill-fitting prosthesis.<sup>4</sup> The presenting complaint of the patient justifies the higher impact response in this domain.

Higher negative pre-treatment responses for psychological discomfort and disability accompanied by social disability and handicap might be contributory because of the psychological morbidity produced by the uninformed ablative surgical procedure as well as delivery of earlier unsatisfactory prostheses to the patient. This is in agreement with the findings of Kornblith *et al*.<sup>11</sup> Patient's difficulties in speaking and eating and alterations in appearance may have been frequently reinforced by a range of strained and negative social interactions with others. Feelings of being stigmatized due to loss of function and unsightly appearance have been reported by others to markedly restrict patients' social activities.<sup>21</sup>

Hence, the low impact responses prior to the treatment.

Most of the pre-treatment OHIP-14 responses were on the right side of the Likert's scale, whereas the responses shifted to the left side postoperatively. Improved post-treatment impact responses were recorded as attempts were made to improve upon the previous deficiencies. Elaborative counselling with improved prosthesis design may also be the probable cause of the improved OHR-QoL. The post treatment responses were recorded after two months. Need is felt to record similar responses in a later periods, therefore the patient is scheduled for further follow-up appointments and further improvement of OHR-QoL is anticipated.

## CONCLUSION

The prosthodontic treatment of maxillectomy patients involves not only the restoration of lost oral structures but also includes the rehabilitation of lost functions and reduction in the patient's psychological suffering. Although the gap between pre-treatment responses and the post treatment responses is minimal, the difference in the responses showed that the new improved prosthesis had a positive impact on the patient's oral health related quality of life.

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