

Prosthodontic management of a patient with limited mouth opening: a case report

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Abstract: Restricted mouth opening (microstomia) is a condition that hinders conventional prosthodontic treatment. The use of sectional or modified dentures and those with a small degree of flexibility has been reported in partially or totally edentulous patients. In the spirit of improving patients' quality of life, we have attempted, through this case report, to propose a real and convenient solution for a young patient with an oral sequela of head and neck radiotherapy.

Keywords: flexible dentures, impression, polyamide, prosthesis, restricted mouth opening.

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I. Introduction

In prosthodontic practice, limited mouth opening in patients is a relatively common occurrence [1]. It manifests as a consequence of certain conditions namely cleft lips, burns, maxillofacial trauma, radiotherapy or scleroderma. Prosthodontic management of patients with restricted mouth opening presents difficulties at all stages, right from the preliminary impressions to the insertion of prosthesis [1, 2].

A maximal oral opening that is smaller than the size of a complete denture can make prosthetic treatment challenging [1]. Several techniques have been described for use when either standard impression trays or the denture itself becomes too difficult to place and remove from the mouth. In light of this situation, flexible dentures or non metal clasp dentures, have been developed in order to respond to increasingly strong patients' demands with respect to esthetic aspect and comfort.

II. Case report

A 26-year-old female presented to the Department of prosthodontics, Farhat Hached Teaching Hospital, Sousse, Tunisia, requiring prosthetic rehabilitation. Past medical history revealed that she suffered from an Undifferentiated Carcinoma of Nasopharyngeal Type (UCNT) which was treated by radiotherapy since 2006. The result was a severely reduced mouth opening of 15 mm (Fig1).

Decreased lower facial height was noticed on the extraoral examination. The intraoral examination revealed a dry mouth, a flabby mucosa and an extremely resorbed maxillary ridge except for the anterior area (limited between both canines) whereas the mandibular ridge was large on the right side and had a knife edge form on the left side. All maxillary teeth were absent or removed except tooth number 27 which was conserved owing to the high risk of post radiation osteonecrosis. Accordingly, we opted for a complete overdenture supported by the roots of the remaining tooth.

It was therefore decided to fabricate mandibular partial denture and maxillary complete denture using a flexible resin (polyamide: Valplast®) which is developed from a type of nylon material.



Figure 1: Maximum mouth opening.



Figure 2: Pre-operative maxillary view.



Figure 3: Pre-operative mandibular view.

III. Clinical procedure

- Because of the limited mouth opening, the insertion of a stock tray was not possible. Therefore, preliminary impressions were made with polyvinyl siloxane putty material with the help of finger pressure. Flexible impression technique described by Whitsitt and Battle [3] was used to make preliminary impressions. The material was manipulated, rolled, and adapted to the hard and soft tissues (Fig4, 5). Catalyst proportion was altered to reduce setting time to 1 min [4]. The impressions were poured in dental stone to obtain primary cast.



Figure 4: preliminary impression of maxillary ridge.



Figure 5: preliminary impression of mandibular ridge.

- Photopolymerizing acrylic resin special trays were fabricated on each stone cast. Border molding was done using thermoplastic material following by the making of final impressions using polysulfide (Permlastic Regular®) (Fig 6, 7). Maxillary and mandibular impressions were then poured with dental stone.



Figure 6: Final impression of maxillary ridge using polysulfide.



Figure 7: Final impression of mandibular ridge.

- Jaw relation record was obtained with the use of wax rims oriented to established vertical dimension occlusion.
- After tooth arrangement, esthetic try-in was accomplished and flexible dentures using Valplast® were fabricated.
- For insertion, the prostheses were immersed in 40°C warm water [5]. After 1 minute, they became deformable and able to be small enough to be quickly inserted into the patient's mouth [6]. Once seated on the maxillary and mandibular residual ridges, the denture regained its initial strong shape to permit the function [5] (Fig8, 9).



Figure 8: Maxillary flexible denture.



Figure 9: Mandibular flexible denture.

- Instructions about insertion and removal of the prostheses were given to the patient. Oral hygiene instructions were given to maintain the denture.
- The patient was reported for the follow up visits after 24 hours and then 1 week later. She was happy with the flexible dentures which were comfortable (Fig 10, 11). Regular recalls at intervals of 1, 2, 3, 4, 5 and 6 months indicated a good and satisfactory response toward the prostheses.



Figure 10 : Definitive prostheses.



Figure 11: Postoperative view.

IV. Discussion

Difficulties of reduced mouth opening can be overcome by using flexible resin. The material has a lower elastic modulus comparing to acrylic resins. It is easily deformable, elastic and unlikely to fracture. It has the ability to be made smaller for insertion and quickly regain its shape once inserted. Thus, the flexibility, combined with strength and light weight [7], provide total comfort [8]. Colorless and odorless, it has no risk of allergy and is highly resistant to both acid and alkalis [9, 10].

The occlusion and appearance are much enhanced: as the material is semitransparent pink, it easily blends in with the color of the gums, giving it the esthetic advantage that the border between base and gums is difficult to distinguish [9, 11].

In addition, denture insertion and removal become relatively easy. Immediately prior to inserting the prostheses, the patient should immerse them in a bowl of warm water which allows a good adaptation with the natural tissues in the mouth [6]. A warm drink of water is also recommended to break the seal before removing the dentures [5].

Other management techniques have been described in the literature for patients with restricted mouth opening including use of dynamic opening devices and modification of denture design. There are several reports of modified treatment with sectional and hinged dentures, using various mechanisms for connecting each of the components [1, 12, 13]. But, when the oral opening is limited, joining the pieces of a sectional or collapsible denture base intraorally may be problematic [14]. Their fabrication procedure can also be complicated, whereas treatment planning considerations include simplicity and minimal effort. For this reason, the flexible denture may constitute a good alternative as it allows an easy and quite rapid insertion. The patient has to manipulate the prostheses successfully and use them according to the recommended instructions. [7]

V. Conclusion

The flexible denture may constitute a good option for patients with limited mouth opening. It permits an easy and quick insertion and fulfills their requirements particularly facility, comfort and especially rehabilitated occlusion leading to a better quality of life.

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