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AN ALTERNATIVE METHOD TO TREAT MICROSTOMIA

Prosthodontics

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ABSTRACT

This case report deals with treatment of a female patient who was completely edentulous,presenting with limited mouth opening due to oral submucous fibrosis and was treated prosthodontically with a new and an innovative as well as an economical sectional tray design.The path of insertion and removal were altered during the treatment, to execute the clinical procedure to result in the fabrication of the complete denture prosthesis as a whole, rather in sections, which could be easily inserted and removed.

KEYWORDS

Microstomia, OSMF, Sectional Tray Design

Introduction

In the field of prosthodontics, rehabilitation of a patient with the best results is the primary goal, but at times there comes situations which are clinically challenging for the operator, due to the presenting underlying conditions. Such clinical cases must be handled with utmost care, knowledge and understanding of the condition by following an alternative method if required, to execute the clinical procedure to attain best results. One such condition is Microstomia. A patient with microstomia presents a challenge at all stages to the clinician.

Although prosthodontics is emerging as an art and science, it is still facing several challenges which is beyond human control, especially in cases of limited mouth opening, which is often a sequlae of conditions like scleroderma, post operative head and neck injury, Oral Sub Mucous Fibrosis (OSMF) trismus, surgical treatment of orofacial cancers, cleft lips, burns, Plummer Vinson syndrome. 1-4

Certain genetic disorders also present with microstomia include Scleroderma, Holoprosencephaly, Richieri-Costa –Pereira syndrome, Freeman –Sheldon syndrome, Fine-Lubinsky syndrome, Leopard syndrome, Auriculo-condylar syndrome 5

Most commonly microstomia is associated with OSMF. It is a condition which is seen in patients with chronic use of tobacco, arecanut and spices , as a result of which the mucosa eventually becomes blanched, opaque and fibrotic bands appear involving buccal mucosa, soft palate,lips and tongue. The oral epithelium is atrophied with complete loss of rete pegs, hyalinization of the connective tissue, homogenization of collagen bundles and obliteration of blood vessel. The fibrosis involves the lamina propria and the submucosa and may often extend into the underlying musculature resulting in the deposition of dense fibrous bands giving rise to the limited mouth opening which is a hallmark of this disorder.6

Consumption of spicy food, nutritional deficiency of Iron and B-complex, smoking, alcohol and tobacco play a significant role in the initiation of the disease. The most serious consequences of OSMF is malignant transformation or development of squamous cell carcinoma of affected tissues, which occurs in 3-6% of the cases. Moreover recent data suggests that the prevalence of OSMF in India has increased from 0.03%- 6.42%.

Prosthetic rehabilitation of patients with OSMF and Microstomia presents difficulties at all stages, right from making the preliminary impressions till the fabrication and insertion of the final prosthesis.,as this condition presents with limited mouth opening in the patients. It may be impossible to make impressions and fabricate complete dentures using conventional methods and because of the limited mouth opening, it will be difficult to proceed with the planned treatment. The pathway for good nutrition is from the mouth and when that itself is facing limitation, it will show as an overall deterioration in the health, hence microstomia is a serious condition and must be dealt swiftly.

Case Report and clinical procedure

A 60 year-old female patient with a history of limited mouth opening , had come to sought treatment at the Department of Prosthodontics, A.B. Shetty Memorial Institute of Dental Sciences, Mangalore for the complete replacement of upper and lower teeth. (Figure.1) .On recording the history, it was found that the patient presented with limited mouth opening since past 2 years and had a habit of chewing areca nut\ beetle nut with a duration of 4-5 times/day since last 5 years.

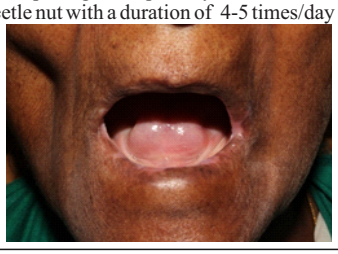

Figure1- Image showing the maximum Oral Opening of the patient

Her mouth opening vertically was measured and found to be 33mm and intercommissural width was 43mm. Patient was undergoing treatment for the same with intraoral medication. On intraoral examination, it was found that, mucosa appeared blanched with palpable fibrotic bands and with a very shallow or nearly no sulcus in the mandibular arch. Both the arches also presented with poor alveolar ridges. Keeping the condition in mind,various treatment options were discussed and the following treatment was decided, for better prognosis and viewing the best interest for the patient.

The insertion of a loaded stock tray into the patient's mouth was challenging. Here it was noticed, with the alteration in the path of insertion of the stock tray to a more horizontal path , the preliminary impressions were manageable, hence by doing this we can avoid sectional trays for the preliminary impression. If at all, such alterations cannot be brought upon during the treatment, the sectional tray design and/or the alternative impression techniques can be followed 7-8

As the mouth opening was limited , the smallest available stock tray (size-0) was selected for the mandibular arch and a stock tray (size-1) was selected to make the maxillary impression. A priliminary impression was then made with irreversible hydrocolloid impression material.(Algitex, Alginate Dental Impression material)

proceeded to the border molding procedure by designing a new sectional tray design, with the fabrication of an interlocking acrylic stub.

Sectional Tray Design

In literature various tray designs have been mentioned, right from using the Lego system by Luebke to the use of magnets in the sectional tray design along with certain alterations in the impression making procedure. The sectional tray design used here,has been dealt with further more alteration as it was designed, not only to make it economical but easy to use by the operator.

Both the trays were fabricated in equal halves separately; using autopolymerising acrylic resin and snap buttons were incorporated into the tray design. In the mandibular sectional tray, the snap button was placed in the handle, keeping it basic and closes snuggly once both the halves of the button align which only can be separated on the need of the operator. The maxillary design also used the snap button in the handle, along with the fabrication of an interlocking acrylic stub, so the trays cannot be separated out till the stub has been removed by the operator. The stubs must be used extraorally, to align the sectional impression in place-as one unit.(Figure.2a, 2b).The acrylic stub was created using a small piece of metal sprue on which autopolymerising acrylic resin was adapted into close proximity with the metal and was then checked for its interlocking in the tray(Figure 2c, 2d).

A small platform was created on both the halves of the tray, for the stub approximate and interlock respectively. The design of the stub is such, it provides rigidity to the sectional impressions, by preventing its dislodgement from the snap buttons, hence making it easy to follow the further laboratory procedures.

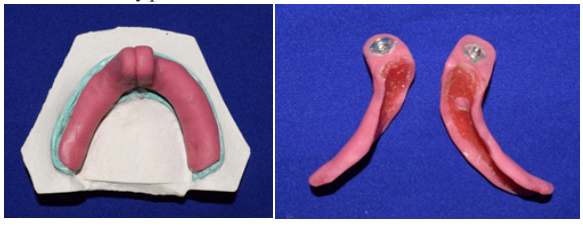

Figure 2a- Mandibular sectional tray design

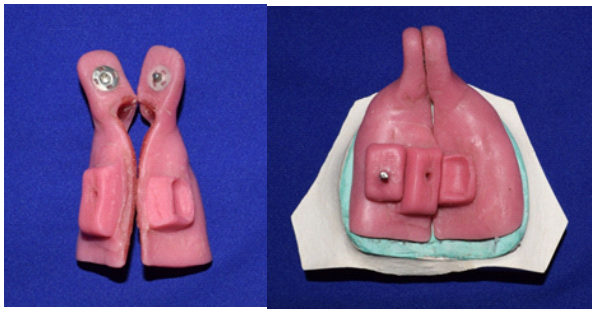

Figure 2b- Maxillary tray design, showing acrylic stub

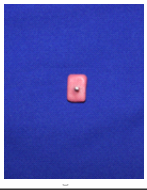

Figure 2c- Acrylic stub, used for interlocking

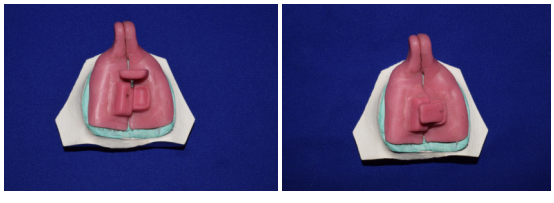

Figure 2d- Image showing interlocking of the maxillary sectional tray using the acrylic stub

Later, border molding of each half of the arches were carried out separately with green stick compound (DPI Pinnacle tracing sticks) followed by making of secondary impressions using a light body elastomeric impression material.(company name) Stopper The impressions were then joined and locked(using the acrylic stub) extraorally to form a single unit impression. (Figure. 3a, 3b)

Figure 3a- Sectional Border molding, using green stick

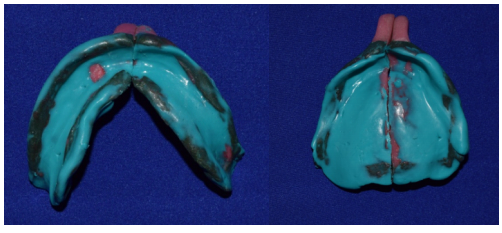

Figure 3b- Maxillary and Mandibular Secondary Impressions

Next to this, the impressions were aligned, tray was locked using the acrylic locking stub and beading and boxing was performed and the master cast was poured, retrieved later once it had set (Figure-3c)
The tray and the rims were decided to be fabricated as a single unit, rather in sections to avoid discrepancies in recording the jaw relation.

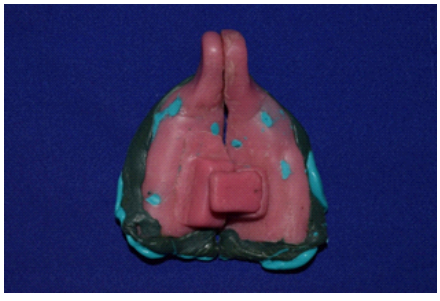

Figure 3c- Alignment and locking of the sectional impressions using the acrylic stub

A greater horizontal path of insertion was used, as earlier during the making of preliminary impressions. The denture base along with the occlusal rim were inserted satisfactorily. Teeth selection was done and non anatomic (zero degree) teeth were decided to be used, in order to enhance stability to the dentures as there will be elimination of inclined planes, hence more vertical forces will be rendered (adding to stability). The trial insertion of the waxed up denture was carried out as a single unit and the occlusion was determined(Figure.4)

Figure 4- Trial insertion of waxed up denture

The fabrication of denture was carried out and the denture was obtained as a whole. The fit of the final prosthesis was executed in the patient and the esthetics, occlusion, stability and retention were verified. Due to poor residual alveolar ridge, the retention was compromised. The final prosthesis had to be religned, in order to achieve retention therefore relining of prosthesis was carried out, which improved its retention. After the final fit in of the prosthesis, post operative instructions on denture care, hygiene and maintenance were given(Figure 5)

Figure 5-Post operative view after fit and insertion of final

Patient was also recalled for follow up (post insertion checkup) during which patient presented with no complains and was satisfied and happy with treatment provided. It was also noticed, the oral opening had slightly increased, due to cessation of the habit and also due to counseling and oral medication.

Discussion

Dealing with an edentulous patient presenting with microstomia in the field of prosthodontics is a challenging task hence the clinician must deliver the best treatment possible keeping the underlying condition in mind, swaying away from the conventional treatment method-, if and when required to a more condition oriented treatment procedure.

Many authors have suggested different ways of making an impression along with the construction of special sectional trays in patients .The plastic tray can be cut in two sections with a disc with the handle in the larger section. Three building blocks were selected to re-approximate sectional trays by Leuboke .

McCord et al. 9-10 described a complete sectional denture for a patient with microstomia which was designed in two halves; with the left side fitting into a beveled recess in the right side to give a more accurate location.
Naylor and Manor 11 described a technique for the construction of a flexible prosthesis for the edentulous patient with microstomia that may be used to perform an oral augmentation exercises to increase the vertical opening.

Watanabe et al.12described a prosthesis, which presented a cast iron platinum magnetic attachment system applied to sectional collapsed complete dentures for an edentulous patient with microstomia

In comparisons to the described designs in literature, this tray design differs on the basis of economic and simplicity factors. The design is like a inter locking system which can easily lock and unlock when required by the operator, preventing its unrequited separation.This design has been inspired from a key and lock system in which the acrylic stub acts as a key to interlock the trays.

The acrylic stub prevents the separation of the two halves of the tray, making it easy to handle during laboratory procedures. The sectional halves aid in executing the procedure without causing discomfort to the patient or to the clinician, as the size of the oral opening decreases, the difficulty in treatment procedures involved increases.

Oral medication followed by habit counseling is a must for such patients. Surgical intervention will be the last treatment option. However, in certain patients with severe microstomia, it is very difficult to perform prosthodontic treatment without surgery.

Surgical enlargement of the orifice must be carried out with precision because if the surgical procedure was not adequate or if there is a relapse, it may result in a scar. Post to the surgical treatment, the patient may also be required to wear a splint, in order to avoid relapse.12-15 It is the operators duty to give proper patient education and instructions on maintenance and improvement of the condition. Patient must also be made aware of home exercises on stretching of the muscles, which is a must.16-17. Patient motivation and cessation of habit, for a better healthy life style must be implemented.

Conclusion

This clinical report describes altering the conventional clinical procedure to achieve good result and also the fabrication of a new sectional tray design with a locking system, which is not only easy to fabricate and to work with, but also very economical. Dealing with microstomia needs good understanding of the condition by the operator and also the clinical skills to alter the conventional method to a more easy and alternative way to execute the clinical procedure.

The reduction in maximal mouth opening will hinder the conventional prosthetic treatment for the edentulous patients. It is often difficult to apply conventional clinical procedures to construct dentures for patients who demonstrate limited mouth opening.

However, with careful treatment planning and the use of either sectional impression techniques and/or sectional dentures, many of the apparent clinical difficulties can be avoided. Individuals with microstomia would benefit from early referral to several medical services. The improvement of mouth opening impacts on the patients quality of life by enabling them to perform activities such as speech, eating, maintaining oral hygiene, expression & social interaction.This improved functional performance also impacts positively on psychosocial well being

Further advancements and research must be carried out in the field of removable prosthodontics, specially in challenging case situations of OSMF and Microstomia, to achieve the best results and patient satisfaction.

References

1. Luebke RJ. Sectional impression tray for patients with constricted oral opening. J Prosthet Dent 1984;52:135–7.
2. Cura C, Cotert HS, User A. Fabrication of a sectional impression tray and sectional complete denture for a patient with microstomia and trismus: a clinical report. J Prosthet Dent 2003;89:540–3.
3. Gajwani S, Prasad DK, Hegde C, Shetty NS, Shetty M, Mody P. Prosthodontic rehabilitation of an edentulous patient affected with oral sub mucous fibrosis. J Indian Prosthodont Soc; 2008;8:228–30.
4. Benetti R, Zupi A, Toffanin A. Prosthetic rehabilitation for a patient with microstomia: a clinical report. J Prosthet Dent 2004;92:322–7
5. Gulses A. Microstomia: A Rare but Serious Oral Manifestation of Inherited Disorders. Advances in the Study of Genetic Disorders. 2011;
6 Gupta M.K., Mhaske S, Ragavendra R, Imtiyaz; Oral submucous fibrosis - Current Concepts in Etiopathogenesis. PJSR;2008;1 :39-44.
7. Hegde C, Prasad K, Prasad A, Hegde R. Impression tray designs and techniques for complete dentures in cases of microstomia—A review. J Prosthodont Res. 2012;56(2):142-146.
8. Aswini Kumar K, Bhat V, Nandini V, Chandrasekharan Nair K. Preliminary Impressions in Microstomia Patients: An Innovative Technique; J Indian Prosthodont Soc ;2012;13(1):52-55.
9. McCord JF, Tyson KW, Blair IS. A sectional complete denture for a patient with microstomia. J Prosthet Dent 1989;61:645-7.
10. Dent Res. 2014;5(2):93-97.
11. Naylor WP, Manor RC. Fabrication of a flexible prosthesis for the edentulous scleroderma patient with microstomia. J Prosthet Dent 1983;50:536-8.
12. Watanabe I, Tanaka Y, Ohkubo C, Miller AW. Application of cast magnetic attachments to sectional complete dentures for a patient with microstomia: A clinical report. J Prosthet Dent 2002;88:573-7.
13. Nanda A, Krishnan S, Kaur H, Koli D, Manak K, Verma M et al. Correction of microstomia in an edentulous patient. J Prosthet Dent; 2016;115(2):137-140.
14. Sofos S, Tehrani H, Goldsworthy E, McPhail J, Shokrollahi K, James I. Management of Extensive Facial Burns in the Intensive Care Unit. J Burn Care Res; 2015;36(2)
15. Koymen R, Gulses A, Karacayli U, Aydintug Y. Treatment of microstomia with commissuroplasties and semidynamic acrylic splints; Oral Surg Oral Med Oral Pathol

Oral Radiol Endod;2009;107(4):503-507.
16. Messina P, Pizzo G, Scardina G. Effects of a nonsurgical exercise program on the decreased mouth
opening in patients with systemic scleroderma; Clin Oral Investig;2004;8(1):40-40.
17. Parasrampuria N, Tated G, Yeshwante B, Baig N. Electrical injuries of the oral cavity: A menace to mankind. Indian Journal of Health Sciences. 2015;8(1):11.
18. Rangil.J, Martinez M, Silvestre FJ; Dental management of patients with microstomia. A review of the literature and update on the treatment –; J.oral res2015;4(5); 340-350
19. Anupama P, Krishna P ,Hegde C; Prosthodontic Rehabilitation Of A Patient With Oral Submucous Fibrosis And Microstomia : A Case Report.; NUJHS Vol. 2, No.2, June 2012
20. S. Kumar M.K, Nariman R, Krishna P; A sectional impression tray technique for an oral submucous fibrosis patient with limited mouth opening. Journal of Oral Research and Review. 2014;6(2):65.
21. Jack H. Koumjian,and David N. Firtell ;A prosthesis to control microstomia, ; J Prosthet Dent; oct 1990