AN INNOVATIVE DESIGN OF COLLAPSIBLE COMPLETE DENTURE IN A PATIENT WITH SCLERODERMA: A CASE REPORT

Siwach S.,* Siwach V.**

Microstomia is a relatively common condition that has variety of causes. Dentists face this challenging situation while treating patients with orofacial malignancies, trauma, burns, Plummer-Vinson syndrome or scleroderma that results in limited mouth opening. This case report outlines such a situation and highlights an innovative design of collapsible complete denture in a patient with scleroderma.

Key Words: Microstomia; Scleroderma; Collapsible denture

Scleroderma is an autoimmune, rheumatoid factor-positive disease that may be localized or systemic, affecting the skin, lungs, kidneys, and cardiovascular system. It involves connective tissue and blood vessels and leads to fibrosis, which is characterised by hardening and tightening of the skin and mucosa [1]. The abnormal collagen deposit affects the facial skin producing the appearance of a mask like face [2]. The lips are thin and rigid and partially fixed producing microstomia. Dental effects include xerostomia, microstomia, idiopathic resorption of tooth and bone, oral effects of medications, erosion and decay caused by gastroesophageal reflux disease (GERD), and poor oral hygiene due to reduced manual dexterity [3].

The most common problem with dental treatment of scleroderma patients is derived from narrowing of the oral aperture and rigidity of the tongue. Intra oral procedures become difficult due to limited accessibility. The reduced mouth opening is of clinical significance because it impairs oral hygiene and makes conventional prosthodontic treatment difficult[4].

Several methods of prosthodontic treatment for patients with micorstomia have been presented which include sectional impressions and dentures[5], flexible impressions[6], swing lock dentures[7] and cast magnetic attachments [8].

* *Professor, Teerthankar Mahavir Dental College, Moradabad*
** *Classified Specialist, Military Dental Centre, Meerut Cantt*

Case Report

A 32-year old woman reported to the clinic with the chief complaint of inability to eat food due to several extractions (Figure:1). History revealed that she had scleroderma which had begun nine years back with painful swelling and ischemia of the fingers. Some months later the same manifestations occurred in the toes and resolved without any residual malformations but small joints in the hands, especially the last phalanges were affected making finger movements very difficult. The mouth opening had got reduced over a period of two years making oral hygiene procedures difficult. Microstomia along with reduced manual dexterity led to caries and periodontal involvement of the dentition leading to several extractions.

Extra oral examination showed the reduced mouth opening of 10 mm with thin lips. Intra oral examination revealed that the maxillary arch was completely edentulous and in the mandibular arch only the anteriors were present which were carriously involved. The mandibular anteriors were supracrupted while the rest of the mandibular ridge was severely resorbed. Since the supraerupted anteriors would have impaired the aesthetics and the functioning of the maxillary denture, they were submerged after endodontic treatment in order to prevent further resorption of the ridge.

The limited mouth opening negated the possibility of making a conventional denture as it would be impossible to insert the maxillary or mandibular

denture as one piece in the mouth. Sectional maxillary denture as described by Cura etal [9] made in three parts was fabricated but it proved to be unsuccessful because of reduced manual dexterity of the patient.

An innovative collapsible denture using hinges was thought upon incorporating hinges from thick rimmed spectacles. These hinges were precision made and most importantly were very small and easily available. Designing a foldable lower denture was comparatively easy as the lower denture could just fold inwards on its midline during insertion and could be opened out inside the mouth and seated over the lower ridge.

The upper denture could not collapse inwards because the central incisors would hit in the midline and prevent a complete collapse. The upper denture was then designed in such a way that the two sections could be held together by a hinge as one unit (section 1) and a second part or the plate bearing the central incisors could be overlaid and interdigitated with the grooves on section 1. This combination allows the prosthesis to be collapsible while maintaining the structural durability. Advantages include ease of insertion and removal while providing maximum coverage for support, retention and stability.

Step by Step Procedure

1. Primary impressions were made by placing a high viscosity elastomer (putty) around the ridge and the material was reinforced using a wooden spatula in the midline. The spatula was earlier cut longitudinally in the midline and repaired with a weak glue so that it could be easily separated into two parts at the time of removal of impression. The vertical grooves on the spatula served as reference points for the interdigitation of the two parts of the impression. The set impression material was cut in the midline using the grooves on the spatula as guideline. The two halves of the impression were removed separately each carrying one half of the spatula. The two halves were then relocated to pour the working cast [10].
2. Sectional trays with interdigitating grooves in the midline were made on the working cast using auto polymerising resin. Trays were adjusted in the mouth within the limitations of restricted mouth opening and the rigidity of the oral tissues. Definitive impressions were made with sectional border moulded trays using zinc oxide eugenol. Excess material which had flown over the grooves was cut away with sharp scalpel and the trays were assembled into perfect interdigitation outside the mouth and the two halves were bonded together with cynoacrylic cement at the key handle [11].
3. The master casts were made and duplicated. A mandibular denture base using heat cure acrylic resin was made and sectioned vertically in the midline and repositioned on the cast. A hinge assembly was attached on the lingual side of the lower denture base in the midline using autopolymerising resin thus making a single foldable mandibular denture base (Figure2A).
4. Maxillary denture base was made and cut in the midline separating the two parts by a 1cm gap. The two parts were then placed on the cast and joined using a hinge. The maxillary denture base with a 1cm gap was now attached in the midline with a hinge(Figure 2B). A wax up for the overlying part was made by placing the assembly on the cast. This overlay part would close the 1 cm gap and interdigitate with the two parts attached by the hinge and would carry the central incisors. This piece was later acrylised taking care to avoid any distortion. This piece fitted snugly over the hinge assembly thus filling the gap created for folding the upper denture.
5. The denture bases were tried in the mouth for the perfect fit and interdigitation of the parts (Figure3A,B).
6. Jaw relations were recorded and try in was done.
7. The upper denture was acrylised in two parts taking extreme care to avoid any acrylic getting in between the functioning of the hinge. The second part carrying the central incisors was acrylised separately (Figure4A).

8. Patient was trained for insertion (Figure4B), interdigitation and removal of the denture in order to prevent any damage to the oral tissue. The patient has been evaluated through follow up visits.

Summary

This article describes an innovative yet simple and cost effective design of a collapsible complete denture in a patient with scleroderma with limited mouth opening and reduced manual dexterity which aids for a better function, health, esthetics and overall well being of the patient.

References

1. Nevill BW, Damn DD, Allen CM, Bouquot JE. Oral &Maxillofacial Pathology. Philadelphia.WB Saunders 1995:586-6.
2. Leader DM. Scleroderma and dentistry: every dentist is a scleroderma specialist. J Mass Dent Soc 2007:56(2):16-9.
3. Fischer DJ, Patton L. Scleroderma: Oral manifestation and treatment challenges. Spec Care Dentist2000;20(6):240-44.
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. Geckili O, Cilingir A, Bilgin T. Impression procedures and construction of a sectional denture for a patient with microstomia: A clinical report. J Prosthet Dent 2006;96:387-90.
6. Jivanescu A, Bratu D, Negrutiu M. Prosthetic rehabilitation of a patient with scleroderma-induced microstomia. Int Poster J Dent Oral Med 2007;09: Poster 382
7. Wahle JJ, Gardner LK, Fiebiger M. The mandibular swing-lock complete denture for patients with microstomia. J Prosthet Dent 1992;68:523-7.
8. Watanabe I, Tanaka Y, Ohkubo C, Miller AW. Applications of cast magnetic attachments to sectional complete dentures for a patient with microstomia. J Prosthet Dent 2002;88:573-7.
9. 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.
10. Heasman P.A.,Thomason J.M.,Robinson J.G.The provision of prostheses for patients with severe limitation in opening the mouth Br Dent J 1994;176:172-174.
11. Yenisey M, Kulunk T, Kurt S, Ural C. A Prosthodontic management alternative for scleroderma patients. J Oral Rehab 2005;32:696-700.

SILVER JUBILEE CELEBRATIONS

Pierre Fauchard Academy – India Section

Joint Conference of PFA & ODOAN, Kathmandu – Nov. 15-16, 2011

A two-days joint conference of Pierre Fauchard Academy, India Section and Orthodontic and Dentofacial Orthopaedic Association of Nepal (ODOAN) will be held at Kathmandu, Nepal on 15th and 16th of November, 2011. On this occasion, a special convocation of PFA India Section will also be held as part of the Silver Jubilee Celebration of the Section and Journal of PFA.

New Fellows from Nepal as well as India will be inducted. Fellows from India interested to attend this conference and convocation are welcome. For the further details please contact local convener Dr Robindra Man Shrestha. Email – rabindramans@hotmail.com

Application form for recommendation of new Fellow to PFA can be downloaded from PFA, India Section website: www.pfaindia.org. The duly filled application form along with enclosures and a DD for Rs 14500/- should reach Dr T. Samraj, Secretary-Treasurer, PFA India Section, 24/12C Laxmipuram, Gandhi Road, Salem – 638 007, Tamil Nadu, India latest by October 10, 2011.

Do come and join the above joint venture at Kathmandu.

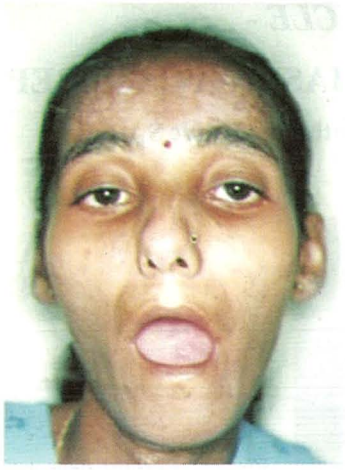


Fig. 1: Microstomia; Mask like appearance of face.

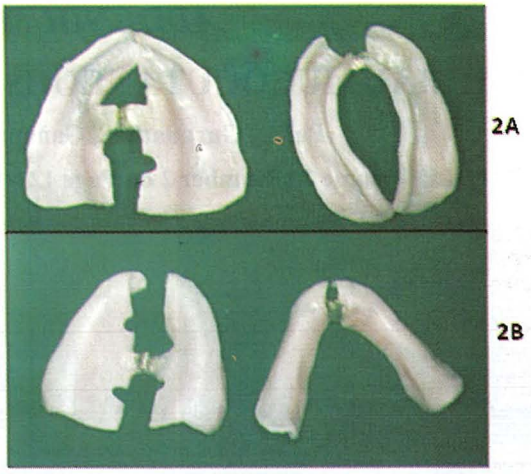


Fig. 2 (A,B) : Acrylised denture bases folded with hinges attached in midline.

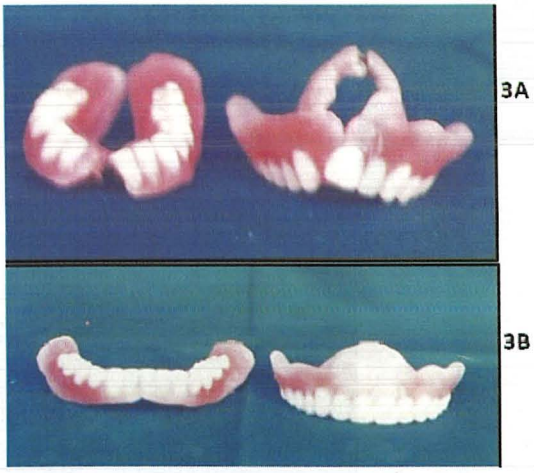


Fig. 3 (A,B): Wax up of the collapsible denture.

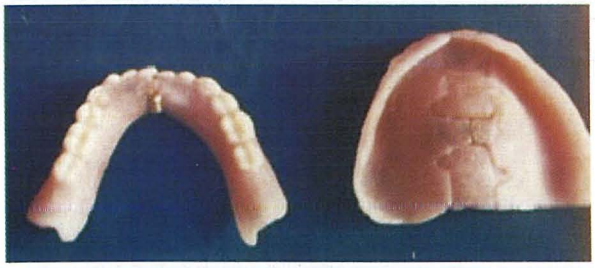


Fig. 4A: Perfect interdigitation of the sectional upper denture; Hinge placed on the lingual side of lower denture.



Fig. 4B: Post-treatment extra-oral photographs.

ADDENDUM TO ARTICLE -

FAMILIAL MUCOCUTANEOUS CANDIDIASIS – A CASE REPORT

Pai A., Gurudath S., Ganapathy K.S., Sujatha D., Hegde S.

Published in Volume 25, Number 2 on Page 124-126.

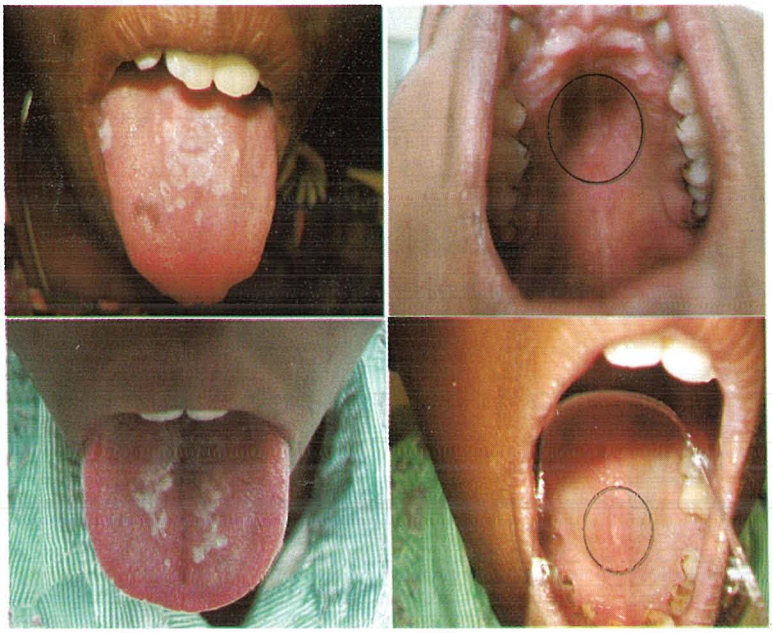


Fig 1- Patient presenting with white curdy, scrapable plaque on the tongue and a kissing lesion on the palate Patient's brother presenting with similar lesions on the tongue and palate.



Fig: 2- Patient's brother shows cutaneous lesions on the back, nape of the neck, hands and on the scalp.

These Figures were missed in printing inadvertently. The inconvenience is regretted.