

Oral Rehabilitation in a Scleroderma Patient

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Abstract

A conventional partial denture can be a successful treatment in most situations. However, the presence of severe lingual inclination of mandibular teeth will interfere with the path of insertion of the partial denture. This is further complicated by scleroderma, a disease that involves the connective tissue that leads to fibrosis characterized by hardening of the skin and mucosa. A 64-year-old female patient was referred to the Department of Prosthodontics, with a complaint of inability to wear the previously made mandibular partial denture. On examination, the patient presented with tightening of the skin around the face. Maxillary anterior denture bearing area was resorbed and flabby with severe lingual inclination of remaining mandibular natural teeth. Prosthodontic rehabilitation was done with labial approach mandibular partial denture and a single complete denture for the maxillary arch.

Keywords: Labial approach partial denture; metal denture base; onlay clasp; scleroderma; single complete denture.

Introduction

Scleroderma is a connective tissue disease characterized by Calcinosis cutis, Raynaud's phenomenon, Oesophageal dysmotility, Sclerodactyly and Telangiectasia. The word scleroderma is derived from Greek words 'sclero' meaning hard and 'derma' meaning skin.¹ Hardening of the skin is one of the most visible manifestation of disease which is characterized by excessive deposition of collagen in the skin and other organs of the body (GIT, CVS, musculoskeletal system). There is contracture of the skin giving a mask-like appearance to the face and claw-like appearance to the hands. The level of internal involvement will determine the seriousness of the disease. Skin becomes hardened and atrophic and cannot be wrinkled because of its firm fixation to the deep connective tissue. The clinical signs in the orofacial region are similar to that elsewhere in the body. Lips become thin, rigid and partially fixed producing microstomia. The tongue may become hard and board like, making speaking and swallowing difficult. When the soft tissues around the temporomandibular joint are affected, movements of the mandible is restricted and opening of the mouth is reduced making dental care problematic.²

In severe lingual inclination of mandibular teeth with missing key abutment conventional partial denture is not possible, as there is inadequate space for lingual major connector, and interference to the path of insertion preventing the seating of framework. Labial bar design provides a treatment option which can be utilized effectively and mitigates the need for destructive tooth preparation or complicated design.³

Single maxillary complete denture poses the challenge of weak edentulous arch opposing natural teeth.⁴ Stability is a constant challenge as dynamic contact of natural teeth destabilizes the denture leading to loss of retention. Denture base fracture is often observed when mandibular teeth are not properly aligned for balance causing flexure. All this requires a complete understanding of denture occlusion to ensure minimal stress on maxillary denture bearing area and prevent denture fracture.⁵

Case report

A 64-year-old female patient reported to the Department of Prosthodontics, with a chief complaint of repeated fracture of upper complete denture and inability to wear lower partial denture since 1 month. Patient also complained of burning sensation to spicy food, dry mouth and difficulty in swallowing. Medical history revealed scleroderma, a rare connective tissue disorder characterized by excessive deposition of collagen in the skin presenting with wrinkled appearance around the mouth (Figure 1). On examination, the patient presented with tightening of the skin in the circumoral region, bending of phalanges of both hands restricting the movement of the fingers (sclerodactyly), digital ulcers, painful joints and a single red patch on the skin of the palm of the right hand (telangiectasia).

Intraoral examination revealed fibrosis of the oral mucosa and xerostomia, flabby maxillary anterior ridge, severe lingual inclination and isolated supraeruption of the mandibular posterior teeth and resorbed maxillary arch. Hematological investigation revealed hemoglobin of 8.6% while complete blood count was within normal limits. Orthopantomogram (Figure 2) and anteroposterior views of hand and wrist (Figure 3) were obtained. OPG demonstrated widening of periodontal ligament space in all remaining teeth. Hand and wrist radiograph showed flexion contracture, calcinosis of distal phalanges and acro-osteolysis (tuft bony erosions) of the terminal phalanges.

Following complete examination and investigations the patient was recommended prosthodontic rehabilitation:

Steps in rehabilitation: Phase-I: Patient's old maxillary denture was relined with tissue conditioner (UfiGelSC, Voco GmbH, A-Silicone, Batch no. 2040) to condition the flabby tissues (Figure 4), the denture fracture was repaired with acrylic resin. Tissue massage and rest was advised.

Phase-II Preliminary impression was made with irreversible hydrocolloid impression material as the flabby tissue was resolved by the use of soft reliner. In presence of flabby tissue the window technique of impression by Klein is

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Figure 1: Mask like appearance



Figure 2: Orthopantomograph showing thickening of the periodontal ligament

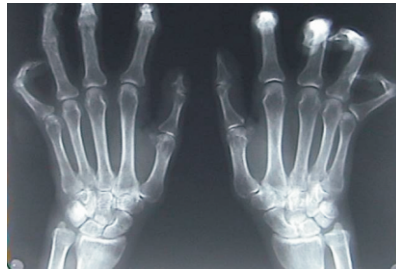


Figure 3: Hand and wrist radiograph showing calcinosis of the joints



Figure 4: Maxillary denture relined with tissue conditioner



Figure 5: Metal casting of labial bar on the refractory cast



Figure 6: Maxillary metal complete denture



Figure 7: Mandibular labial approach partial denture showing occlusal rest and onlays



Figure 8: Frontal profile of the patient after prosthodontic rehabilitation

preferred. Diagnostic survey of the mandibular cast allowed for accurate charting of mouth preparation. Diagnostic mounting helped in visualizing the arch discrepancy and to plan a correction of occlusal plane as well as design the labial approach partial denture. Mandibular second molars were prepared for onlays and acrylic temporary crowns were made to achieve a flat occlusal plane. Final maxillary impression was made with medium body addition silicone (Aquaseal Ultra, Dentsply, Vinyl polysilicone, Batch no. 1013 15) using acrylic special tray. Wax up of the framework on the maxillary and mandibular refractory cast and casting

was done (Figure 5). Metal framework try in was done, facebow record was made with whipmix quick mount bow and transferred to the articulator. Jaw relation was recorded in wax with zinc oxide eugenol (DPI, Batch no. 116112) bite registration paste.

Developing the linear occlusion

Cast was mounted on a whipmix articulator with the incisal pin lowered by 2mm. Maxillary teeth were arranged in an ideal relation as close to the crest of the ridge and customized according to the mandibular natural teeth. Incisal pin was then raised by 2mm. Selective grinding of acrylic teeth

was done with the help of articulating paper till the incisal pin touched the incisal table. This technique helps develop linear occlusion without altering the vertical dimension.

Labial bar with anterior teeth and the maxillary metal denture evaluated for esthetics and phonetics. The maxillary denture was acrylicised and inserted in the mouth (Figure 6). Mandibular labial approach partial denture with attached posterior onlays help in axially directing load from the tilted posterior abutments. The clasps extending from the onlays retain the partial denture and the occlusal rest on mandibular second premolars provides support (Figure 7).

Denture was inserted and occlusion was analyzed (Figure 8). Patient was given instructions regarding tissue care such as drinking ample water to keep the oral mucosa moist, and practice facial exercise to maintain flexibility of the tissues in the orofacial region.

A regular follow-up care was maintained and significant improvement was observed in the chewing ability. Patient was instructed for regular checkup as resorption of bone is a constant challenge in scleroderma. Patient was comfortable with the ease of placement and removal of the mandibular prosthesis.

Discussion

Systemic sclerosis is a highly individualized connective tissue disease with severity of symptoms differing greatly. Oral sequelae include mucosal fibrosis, xerostomia, bone resorption and microstomia which require special care in dentistry.⁶ There is a need to constantly monitor the disease process and to prepare the oral tissue for a new prosthesis. This confirms with the author's suggestion for a careful preventive regime which includes conditioning of tissues with soft reliner and facial exercise to help keep the mouth and face flexible.^{7,8} In case of microstomia, hinge dentures are useful.⁹ A failure to diagnose a pathological condition would have a greater bearing on the patient's life expectancy and quality of life than any short comings of the restoration.

The problem of persistent fracture of maxillary denture was overcome by using the metal denture base (Co-Cr) which is 8.5 times more resistant to lateral deformation under masticatory load.¹⁰ Metal denture also helps prevent fungal growth. This article provides a simple technique for developing linear occlusion without altering the vertical dimension. Linear occlusion allows for better stress distribution with minimal surface contact on a straight line along the

crest of the ridge. The non interceptive occlusion provides a vertical seating force in both centric and eccentric mandibular movements enhancing stability.¹¹ Onlays help restore the occlusal plane and axially direct occlusal load. Our patient had no difficulty in inserting or removal of the prosthesis or separate aids can be given for the same as digital deformity is common in scleroderma.¹²

Conclusion

Labial approach partial denture provides a practical solution in a challenging clinical situation which helps circumvent the severe lingual inclination of teeth. The unique features related to this patient with scleroderma includes the management of persistent fracture of single maxillary complete denture and accommodation to complex systemic problems.

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