SKLERODERMALI 3 HASTANIN PROTETİK REHABİLİTASYONU: 3 VAKA RAPORU

PROSTHETIC REHABILITATION FOR THREE PATIENTS WITH SCLERODERMA: THREE CASE REPORTS

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Özet

Skleroderma, fibrosis, enflamasyon ve damarsal değişikliklerle seyreden, derinin kalınlaşması ve kasılmasına yol açan otoimmun kronik bir hastalıktır. Skleroderma damar ve derinin yanısıra normal bağ doku yapılarını da etkiler. Bağ dokusu vücudun her yerinde olduğundan, vücudun çoğu yeri bu hastalıktan etkilenir. Bu hastalığın ağız içi bölgesinde en sık rastlanılan bulgusu, dudak ve yüz bölgesindeki kasılmalardan kaynaklı mikrostomi dir. Sklerodermalı hastalarda, mikrostomi ve eldeki deformitelerden kaynaklı ağız içi hijyen yetrsizliğinden ötürü, diş kaybı sıklıkla görülmektedir. Bununla birlikte, sklerodermalı hastalara mikrostomiden ötürü ağız içi müdahale oldukça zordur. Standart ölçü kaşıklarının sklerodermalı hastaların ağzına yerleştirilmesi neredeyse imkansızdır. Bu vaka raporlarında, sklerodermalı 3 hastanın oral rehabilitasyonu anlatılmıştır.

Anahtar Kelimeler: Metal-seramik restorasyonlar, scleroderma, mikrostomi, bölümlü protez.

Abstract

Scleroderma is an autoimmune chronic disease causing the skin to thicken and contractions and associated with fibrosis, inflammation and vascular changes. Scleroderma affects not only vessels and skin, but also affects normal connective tissue structures. Because connective tissue is available on each side of the body, unaffected zone is very small amounts. The most important problem encountered in the dental treatment of these patients is microstomia resulting from the tension of the lips and facial skin. Because scleroderma patients are not provided with sufficient oral hygiene because of microstomia and hand deformities, it can often result in the extraction of teeth. On the other hand, limited mobility of the oral cavity of the physician for prosthetic rehabilitation and the difficulty of insert and remove of the prosthesis to the mouth is another serious problem encountered in microstomia patients. In this case series, oral rehabilitation of three patients with scleroderma have been described.

Key words: Metal-ceramic restorations, scleroderma, microstomia, sectional denture.

Introduction

Scleroderma is a characterized chronic connective tissue disease with the hardening of the skin and mucosa as a result of collagen fibrosis. Women are affected 3-4 times more often than men. The disease usually begins between 30 and 50 years old. Occasionally seen in childhood and old age, as well. Although the exact etiology is not yet known, genetic, immunological and environmental factors are thought to be responsible of this. When sclerodermaco-occurs with internal organ involvement such as esophagus, lungs, heart and kidney, prognosis is getting worse. There are two major types of scleroderma: Localized Scleroderma and Systemic Scleroderma. Changes in the localized form only develope on the split area of the skin and on the tissues beneath it. This is relatively light and does not affect internal organs. As for changes in systemic form, they occur in internal organs like skin and blood vessels, joints, digestive system, sometimes in lungs, heart, kidney and muscles. Changes in the connective tissue may affect the function of any of these organs (1-4).

Scleroderma skin is a connective tissue disease affecting the joints and sometimes internal organs. It is characterized by excessive production of normal collagen and vascular damage. Although easy to diagnose, late emergence of the findings over timecan delay the diagnosis. And its co-occuring with the diseases like polymyositis, rheumatoid arthritis,

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systemic lupus erythematosus can also maket he diagnosis difficult (1-5).

Microstomia is found between 70 % and 80 % in the patients with systemic scleroderma (5). In addition, the skin of the affected patient is hard, yellow, straight and shiny. Limitation of fibrosis induced tongue movements and the reduction of salivary flow can often lead to a difficulty in swallowing and speech problems (6). Hand deformity (Raynaud's phenomenon) along with a loss of sense of touchmakes it difficult to place and extract removable dentures (7). Fibrosis occurring in the salivary glands can lead to potential cervical caries and xerostomia. It was reported that periodontal diseases not only result from poor oral hygiene in Scleroderma patients, but also vascular changes are effective in it. A uniform expansion may occurin all teeth and periodontal ligament with progression of disease (3-8).

The most common problem with the dental treatment of patients with scleroderma is the reduction of mouth opening and the tongue has a rigid structure. An average increase of 5 mm can be achieved with the use of stretching exercises in mouth opening. In case that not sufficient mouth opening is provided, you may need bilateral commissurotomy (1,9,10).

Scleroderma can be treated surgically (9,10), by modified mikrostomia orthoses (11,14) and prostheses design (3,5,8). Impressions taken with standard impression trays may be difficult in some cases of less mouth opening. For this purpose, flexible, modified trays and partial trays are used (3-5,8,15,19).

In this case report, oral rehabilitation of three patients affected from varying degrees of scleroderma has been discussed.

Clinical Reports

Case 1

A 40-year-old woman with limited oral opening caused by scleroderma was applied treatment at the dental clinic at Dicle University (Diyarbakır, Turkey) for oral rehabilitation. The patient was learned not to be pleasant of prosthetic restorations done about 10 years before setting the diagnosis of scleroderma in terms of function and aesthetic (Fig. 1a). Each of alveolar crest was sufficiently low, and each one of mucosa was thin. She had a limited mouth opening of 26 mm and 34 mm with tight and inflexible labial tissues (Fig. 1b,1c). She had a limited mouth opening and her lips were stretched. Saliva quantity and flowability were adequate.

Figure 1a.

Figure 1b. **Figure 1c.**

The patients were applied periodontal treatment. Several treatment options were considered. The patient's consent was received by giving detailed information about treatment options. Primarily, old prosthetic restoration that the patient was not satisfied with were extracted and their endodontic therapy was completed. Then, ideal oral hygiene was provided making the periodontal treatment.

Preparations of teeth in prosthetic treatment phase, the chamfer marginal design were prepared and applied according to the principle of metal-ceramic preparation (Fig. 1d). Because of fact that the mouth opening of the patient make it difficult to use standard trays, standard impression trays were divided into 2 parts taking the patient's mouth opening distance into account (Fig. 1e). Impression of teeth were taken using A-type (A-Silicone Elite HD+, Zhermack, Rovigo, Italy) additional dental silicone impression material using large parts of the standard trays after retraction cord (Stay-

put, Medium; Roeko, Langenau, Germany) had been placed to reduce the gingival crevicular fluid.

Figure 1d.

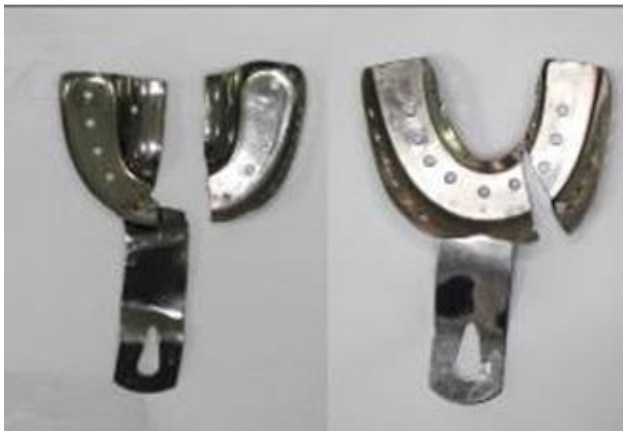

Figure 1e.

Impressions were taken using standard biting tray for right segment in lower jaw (Fig. 1f,1g).

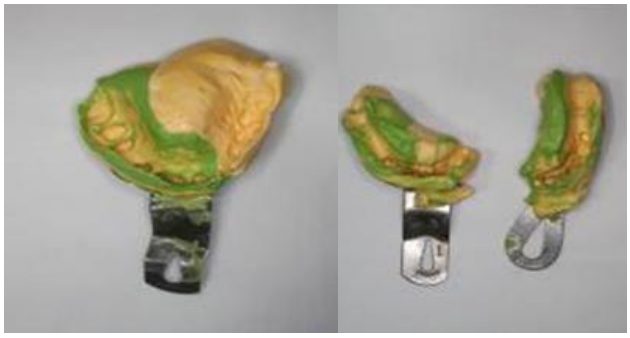

Figure 1f. **Figure 1g.**

Two of upper jaw models of the patient were compromised and laboratory procedures were performed in two separate articulator transferring lower-upper jaw relationship to the articulator. Metal frameworks obtained from unprecious metals through casting method (Ceralloy, Irwindale, ABD) was tried in the following session and the color characteristics of the teeth were determined by conventional methods using Vita 3D Master (Vita Zahnfabrik, Bad Säckingen, Germany) colour scale. After applying low-temperature porcelain (Ceramco, York, ABD) through layering methods on metal frameworks, necessary aesthetic and functional evaluations were performed. Restoration was then cemented to the teeth with the aid of zinc polycarboxylate cement (Adhesor Carbofine Zinc polycarboxylate cement, Spofa Dental, Jicin, Czech Republic) after applying glazing process. The patient's chewing function was regained providing tubercle-fossa relationship and canine-protected occlusion and patient satisfaction was achieved aesthetically (Fig. 1h,1i).

Figure 1h.

Figure 1i.

6 monthly checks were recommended after giving information to the patient about oral hygiene. In her last control, not any prosthetic problem was seen in the patient mentioning not any complaints with her temporomandibular joint and muscles.

Case 2

A 52-year-old woman with limited mouth opening caused by scleroderma was treated at the dental clinic at Dicle University (Diyarbakır, Turkey) for mandibular and maxillary dentures. Her alveolar crest was sufficiently low, and her mucosa was thin. She had a limited mouth opening of about 28 mm with tight and inflexible labial tissues (Fig. 2a,2b). She had a limited mouth opening and her lips were stretched. Saliva quantity and flowability were adequate.

Periodontal treatment was applied to the patient. Several treatment options were considered. The patient's consent was received by giving detailed information about treatment options. Treatment with dental implants was excluded because of volumetric deficiencies in bone height. Since the long-term prognosis of

remaining maxillary and mandible anterior teeth as potential overdenture abutments was good, the patient accepted a treatment plan including the fabrication of a sectional overdenture.


Figure 2a.


Figure 2b.

Overdenture abutments help to preserve alveolar bone, increase denture stability, provide a more favorable crown-root ratio, maintain proprioception from the periodontal ligament, and increase the patient's feeling of well-being. The use of residual natural roots as overdenture abutments allowed the reduction of the palatal-lingual extension of the framework, resulting in improved comfort and stability of the denture. The treatment plan initiated with endodontic treatment no of the 11,21,23,33 and 43 teeth using a labial approach (Fig.2c).


Figure 2c.


Figure 2d.

The teeth were then prepared as overdenture abutments because of fact that mouth opening was limited. Measurements were taken without using a tray putty and light body with additional types of silicone-based measuring materials at one stage in the lower jaw (A-Silicone Elite HD+, Zhermack, Rovigo, Italy) (Fig. 2c). Additional types of silicone measuring material of putty filler has seen the function of the tray. Measurings for coping restorations were made using fabricated tray of putty and light body additional type silicone-based impression materials quadrant in the upper jaw (Fig. 2c). Coping restorations were taken from the optimum-sized impression in terms of using a single stage prosthetic. Finally, coping restorations were adjusted and cemented (Ketac-Cem; 3M ESPE) to the teeth(Fig. 2d).

Removable of dentures maxillary and mandible for the middle lingual Co-Cr alloy metal framework that slide holder was prepared. Patients with prosthesis being in two parts provides ease in inserting or removing (Fig.2e). Vertical dimension was determined by niswonger, three equals and eyeballs corner with lip-syncing floor of the nose-chin distance techniques. The jaws wax patterns were prepared. The casts were mounted in a semiadjustable articulator. Zero-degree artificial teeth (Dentacryl SA; Dentsply Int,York, PA) were arranged. The denture teeth were processed on the definitive denture bases using heat-polymerized acrylic resin (Lucitone 199; Dentsply Intl, York, PA). At the insertion appointment, denture-based adjustments were performed with a pressure indicating paste (Pressure Indicating Paste; Mizzy Inc, Cherry Hill, NJ, USA). The patient was instructed in the insertion and removal of the prostheses (Fig. 2f).

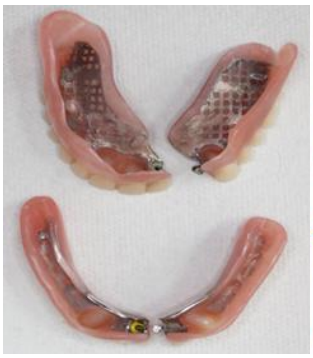
Figure 2e.


Figure 2f.

Initially the patient complained about denture base irritations. The irritations were identified and eliminated during recalls. Symptoms of scleroderma, such as mucosal differences and dryness of the mouth were thought to be responsible for these irritations. Periodic checks have been done every 3 months.

Case 3

25-year-old male patientwas admitted to the Dicle University Faculty of Dentistry Prosthodontics Clinic with aesthetic problems. From the history of the patient, it was learned that the patient was recently diagnosed with sclerodermaand she had dry mouth and tension in the facial skin and lips. It was observed that

decays, discolorations and polydiestema were availablein the tooth (Fig. 3a).Due to being in the initial phase of scleroderma, the patient's mouth opening was enough for dental applications despite the decrease in the flexibility of the facial skin and lips.

Figure 3a.

Figure 3b.

The consent of the patient was received after being informed in detail about the treatment options. Preparations of teeth in prosthetic treatment phase were applied by preparing chamfer marginal design (Fig. 3b). During impressing, impressions of teeth were taken using A-type (A-Silicone Elite HD+, Zhermack, Rovigo, Italy) additional dental silicone measuring material using large parts of the standard impression trays after retraction cord (Stay-put, Medium; Roeko, Langenau, Germany) had been placed to reduce the gingival crevicular fluid. Metal frameworks obtained from unprecious metals through casting method (Ceralloy, Irwindale, ABD) was tried in the following session and the color characteristics of the teeth were determined by conventional methods using Vita 3D Master (Vita Zahnfabrik, Bad Säckingen, Germany) colour scale. After applying low-temperature porcelain (Ceramco, York, ABD) through layering methods on metal frameworks, necessary aesthetic and functional evaluations were performed. But in anterior teeth, In the laboratory phase has zirconium infrastructure design been initiated. For this purpose, infrastructure of crowns were prepared of semi-sintered zirconium blocks(Noritake Alliance, Noritake Co, Nagoya, Japan)(Fig. 3c).

Figure 3c.

Figure 3d.

After the rehearsal of zirconium infrastructure, the color characteristics of the teeth were determined by conventional methods using Vita 3D Master (Vita Zahnfabrik, Bad Säckingen, Germany) colour scale. Then ceramic veneer in laboratory (Noritake Alliance, Noritake Co, Nagoya, Japan)was applied to the infrustructores. Edge and occlusal harmony of the restoration were checked. Then, glaze layer that is the last stage was applied and cementation process was initiated. After applying glaze procedure, metal-ceramic restorations were cemented to the teeth with the help of zinc polycarboxylate cement (Adhesor Carbofine Zinc polycarboxylate cement, Spofa Dental, Jicin, Czech Republic). Adhesive cements for cementation was preferred in zirconia frameworks restorations. First of all, the inner surface of the zirconia ceramic restorations was acidified within 20 seconds with 5% of hydrofluoric acid (IPS Ceramic etching gel, Ivoclar Vivadent, Schaan, Liechtenstein), then it was washed with water sprey for 30 seconds and dried with air. Then, the inner surface of the restorations were silanized with a brush and dried with air after 60 seconds.

Figure 3e.

Then, after acidifying enamel and dentine for 15 seconds with 37 % of phosphoric acid, it was washed air-water sprey during 30 seconds. The surface of the teeth was dried to stay a bit damp with cotton pelets. Then, ethanol-based and dual-cure-featured bonding agent(Adper Single Bond 2, 3M Espe, St Paul, USA)was applied both to the tooth surface and to the inner surface of the restoration, dried in a gentle manner with air and was polymerized for 10 sec with LED (Elipar Freelight 2, 3M Espe,

St Paul, USA). Dual-cure-based adhesive was applied to the interior surface of restoration being mixed with composite resin (Rely X ARC, 3M Espe, St Paul, USA). Restorations were placed in respective teeth and pre-irradiation was made for 5 seconds. Overflowing cement was cleared and adhesive cement was completely polymerized lasting for 20 seconds in accordance with the recommendations of the manufacturer of lighting devices. Marginal integrity of the restoration was controlled and restoration was completed (Fig.3d,3e). The patient was called to the control after 6 months and restorations were evaluated.

Discussion

There is no definitive treatment to stop or to control scleroderma. The treatment usually includes exercise, skin care and various drugs that help treat new complications or checking the status. As a result, treatments are carried to relieve symptoms and to keep a minimum level of damage (1).In the treatment of scleroderma patients do many professionals such as rheumatologists, physiotherapists and psychologists play an important role. In mouth-related problems, great job falls to the dentistfor the provision of adaptation to society by increasing the motivation of these patients.

The main problem with the dental treatment of patients with sclerodermais the tension in the mouth and surrounding tissue in addition to the reduced mouth opening. It is sometimes very difficult without surgeryfor successful prosthetic treatment in a patient with mikrostomil (3,9). Measurements taken with standard measuring spoonsmay be difficult in some cases when mouth opening is little. When the first measure is taken in these patients, putty silicone measuring material can be used without using a spoon. The first measurement process can be completed adding light-body silicon impression material in. In addition, flexible, modified and split spoons are usedin the first and second measurements of such patients (3-5,8,15-19). In our first case, while taking the impressions of the lower-upper jaw of the patient, the standard trays were used having been modified according to the patient's mouth opening. In our second case, the first impression was taken using putty body and light-body silicon impression material without a tray.

In patients with scleroderma, rotten teeth and moderate and severe periodontal disease are frequently observed depending on poor oral hygiene. Most of the time, treatment options are tooth extractions owing to the difficulty in the treatment of teeth due to reduced mouth opening and poor oral hygiene. The narrowed oral cavity and prosthesis limit complicates the construction of the prosthesis. Removable prosthesis is difficult to use in patients with scleroderma because of decrease in hand manipulation. For this reason, primarily fixed prosthodontic approaches should be preferred in terms of ease of handling (15,19). Depending on dental caries and poor oral hygiene of patients with scleroderma, sectional (4,6), magnetic (7,10,11,20) and collapsible dentures [3,9] are used in full or partial tooth loss without a surgical operation. Even if such kinds of prosthetic alternatives are available, fixed prosthodontic treatments are more preferred both due to difficulty of use of the removable dentures by patients and because of fact that laboratory techniques cost a lot and are long.

Combined with advances in the field of dental ceramics, the rise in the demand of patients for more aesthetic restorative materials and increased awareness of the aesthetic has led to the development of many new and different materials and treatment concept. Metal-ceramic systems have proven the success of crown and bridge restorations. But, with increasing interest in aesthetic dentistry, the development of alternatives of metal-ceramic restorations are still continuing (21,22). Especially because of concerns about the quality of aesthetics, optical properties and biocompatibility of metal-ceramic systems, the development of zirconia frameworks ceramics and then full ceramic crowns were provided (23,24). Owing to this, in our third case with high aesthetic expectations, zirconia-based ceramic restorations were applied in anterior region.

Conclusion

A number of people with this disease may sustain a satisfied life. Although a complete recover occurs in patients with scleroderma, a high qualified life can be made possible for the patients with scleroderma through providing motivation with the right

treatment and care. The knowledge and the experience of the dentist is very important in solving oral-related problems of these patients.

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