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CASE REPORT

Portrayal and management of a rarely seen alveolar bone resorption pattern mimicking the Combination Syndrome: a clinical report

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ABSTRACT

Treatment of severely resorbed edentulous alveolar ridges is still a challenging topic of prosthodontics. Combination Syndrome is one of the most remarkable intraoral manifestations of excessive alveolar bone resorption which may be observed at the denture wearing patients with complete edentulous maxilla and bilateral partial edentulous mandibula. Since its first recognition in 1972, the major symptoms and morphological features of the Combination Syndrome such as enlarged maxillary tuberosities and resorbed edentulous ridges were often portrayed as being bilaterally located in either sides of the midsagittal plane. The aim of the present study was to describe a rarely seen alveolar bone resorption pattern mimicking the Combination Syndrome and to report the prosthetic treatment approach applied for its rehabilitation.

INTRODUCTION

Excessive alveolar bone resorption (ABR) and the rehabilitation of reduced alveolar crests are still one of the most challenging topics for dentists despite the resplendent advances in treatment techniques and materials over recent decades.[1-3] A highly specific pattern of ABR depending on the type of edentulism and applied prosthetic devices were first defined by Kelly[1] in 1972 as the Combination Syndrome (CS). This syndrome may occur in the presence of completely edentulous maxilla opposed by natural anterior teeth of mandible.[2,3] CS includes certain clinical features such as; crestal bone loss in the premaxillary region, extrusion of remaining mandibular anterior natural teeth, enlarged tuberosities in both segments of posterior maxilla, and papillary hyperplasia on the hard palate mucosa.[1-4] However, bilateral reduction of the crestal bone in both sides of the midline which is covered by distally

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extended denture bases may be one of the most typical characteristics of CS, because almost all of the published papers regarding CS invariably indicate bilateral changes in intraoral structures as mentioned above.[1-3] Such a resorption pattern may be attributed to the bilateral location of existing anterior mandibular teeth at the right and left sides of the midsagittal plane. However, there is sparse data in literature explaining in details of the resorption pattern of alveolar bone occurred with denture use in complete maxillary edentulism opposed by unilateral mandibular edentulism and its prosthetic management.

The aim of this case report was to portray the clinical features and the prosthetic management of edentulism with a rarely seen ABR pattern mimicking the CS.

CLINICAL REPORT

A 65-year-old Caucasian male patient was referred to Gulhane Military Medical Academy, Department of Prosthodontics complaining of his discomfortable dentures. The patient has been using maxillary complete and mandibular partial dentures for 9 years. The chief complaints of the patient were chewing disability, dislodgement of dentures during mastication and food trapping under the dentures.

In clinical examination, upper complete and lower partial edentulous ridges were observed. All teeth were lost except the mandibular first right premolar and molar which had severe periodontal damage. An excessive bone loss was noted in the right maxillary posterior segment opposing two remaining teeth (Figure 1).

The severe ABR seen in the right side of premaxillary region progressively decreased towards the midline. Flabby ridges with different degrees of lability were also detected in premaxillary region. Additionally, a tremendously enlarged tuberosity was observed in the left maxillary posterior segment opposed to the totally edentulous segment of the mandible. Although the left edentulous mandibular segment displayed excessive ABR, the right segment was not resorbed at all. Besides, a palatal papillary hyperplasia was also determined on the right hard palate surface. Also, lack of adaptation was noted between intaglio surface of denture base and denture bearing soft tissues at the left edentulous region of mandible leading to a poor denture stability. The severe ABR stretching between the midline and the right maxillary tuberosity was observed in radiographic examination also (Figure 2).

Remaining alveolar bone of the right maxillary segment was quite thin and detected only at the base of maxillary sinus. The enlarged tuberosity at the left segment

Figure 1. Crestal height difference of the right and the left maxillary segments caused by unilateral excessive bone loss.

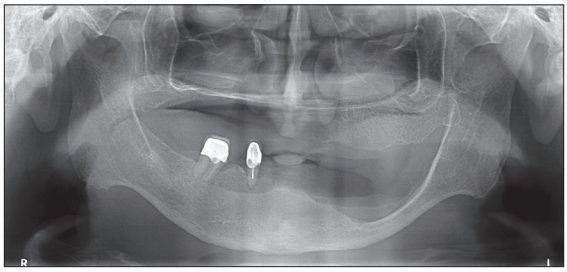

Figure 2. Panoramic radiographic view of the patient.

of maxilla and excessive resorption at the mandibular opposite segment were also confirmed with the radiographic evaluation.

Any surgical intervention was contraindicated due to the general health status of the patient. Such a contraindication prevented the surgical elimination of flabby tissues and restricted the prosthetic options such as implant supported overdentures. Therefore, it was decided to preserve the current oral status and to fabricate removable dentures with lingualized occlusion.

For the recovery of damaged soft tissues, the patient was asked not to wear dentures for one week. At the end of this period, anatomic impressions were made using stock trays and irreversible hydrocolloid material (Phase Plus, Zhermack, Badia Polesine, RO, Italy). Tray flanges were adapted with utility wax (Carmel Waxes, Carmel Group Inc, Montreal, Canada) before the impressions. Anatomical casts were obtained using Type III dental stone (Hera Moldano, Heraeus Kulzer, Hanau, Germany). The premolar and molar dies in the mandibular cast were subjected to a block-out procedure using pink modeling wax to eliminate the undercuts. The borders of denture bearing areas of mandibular and maxillary stone casts were traced, and the marked area was covered with one sheet of pink modeling wax to provide uniform thickness space for the second impression materials. Rectangular shaped stopper cavities (5 mm length and 2 mm width) were prepared in both canine and first molar regions. The prepared sheet wax was covered with autopolymerizing acrylic resin material (Simplex ACR813, Associated Dental Products Ltd, Swindon, UK) with a thickness of 2,5 mm. The spreading method was used for the fabrication of upper individual tray to provide minimum contraction of acrylic resin material. In the present case, a modified individual tray was designed and fabricated for upper jaw. The handle of the custom tray was positioned on both right and left premolar regions (behind the premaxillary region), perpendicular to the median palatinal suture. That posterior handle design provided us the opportunity to prepare windows in the custom-tray to expose the premaxillary flabby ridges for an impression without causing compression. A condensation type elastomeric material (Optosil Comfort, Heraeus Kulzer, Hanau, Germany) was used for the functional impression of the lower jaw. The functional impression of the upper jaw was made in two steps. A compound material (Godiva Exata, DFL, Rio de Janeiro, Brasil) was used for modeling the margins to achieve peripheral seal. Then the borders of flabby tissues were marked with pencil and the tray was placed into the mouth to transfer the stain of the traced lines on the inner surface of the tray. Three separate windows on the anterior region of the upper tray were opened with #15 tungsten carbide burs. Following the adjustments was made using zinc-oxide eugenol (ZOE) (SS White, S.S. White Group, Gloucester, England). After the material was set, excessive impression material was removed with a scalpel from the borders of the windows. In the second step, the tray was seated in place (Figure 3) and ZOE material was gently applied with a sable brush on exposed flabby ridges (Figure 4).

Figure 3. Intraoral view of individual tray after the first step of functional impression.

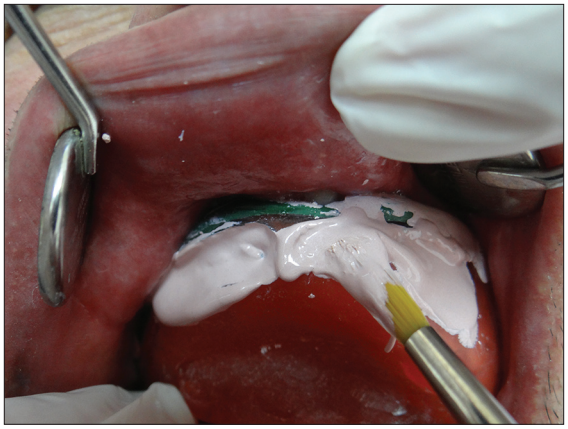

Figure 4. Second step of functional impression: External application of ZOE impression with a brush.

The master models of both jaws were obtained with type III dental stone and the border lines were traced. The fabrication of a metal framework supported removable partial denture with a lingual bar major connector was planned. Then, provisional denture bases were fabricated with autopolymerized acrylic resin material (Meliodent; Heraeus Kulzer GmbH, Hanau, Germany). Wax rims were prepared with pink modeling wax for both jaws, intermaxillary horizontal and vertical relations were recorded and transferred to a semi-adjustable articulator (Artex CT, Amann Girrbach, Koblach Austria) using a face-bow (Figure 5).

The metal framework of the removable partial denture was then placed on its stone cast model. A set of semi-anatomical artificial denture teeth (SR-Orthosit, Ivoclar Vivadent, Schaan, Liechtenstein) with 20-degree tubercle angle was selected to meet the requirements of a lingualized occlusion. The cuspal heights of the existing crowns and artificial denture teeth were reduced, and their central fossae were broadened in order to provide adequate freedom for mandibular lateral movements according to the criteria of lingualized occlusion. After the tooth setting and modelation procedures the temporary denture bases with the artificial teeth were

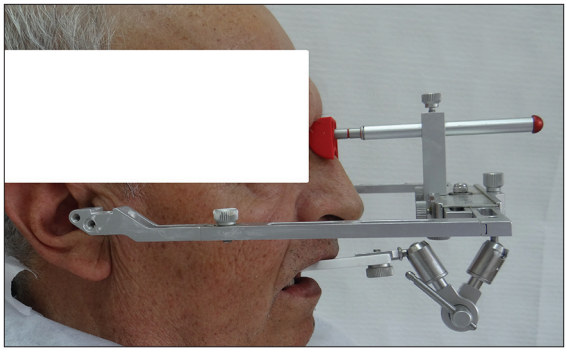

Figure 5. Face-bow application for the transfer of maxillomandibular relations to semi-adjustable articulator.

tried and necessary occlusal and esthetic adjustments were made. After flasking, boiling, and wax elimination steps, permanent denture bases were obtained with heat polymerized acrylic resin (IQ-15, Imicryl, Konya, Turkey). Then, the cast were remounted and minimally occlusal adjustment was performed on the articulator. Pressure Indicator Paste was used to fit finished prostheses, and occlusal contacts were checked in the mouth. Finally new dentures were polished and delivered to the patient (Figure 6).

DISCUSSION

The ABR may originate from a long edentulous period, improper distribution of masticatory forces, excessive load concentration at certain point of the residual ridge, inadequate tissue coverage of denture bases, and the type of denture.[1,5,6] Therefore, the selection of the type of denture and its planning may have an impact on not only the health of remaining tissues but also the patient comfort.[7] In the present case, the two periodontally compromised natural teeth were kept in the mouth in order to avoid the inevitable ABR which would take place following the extractions.[7] Conventional removable dentures were preferred for the prosthetic management of the patient, due to his systemic and local health status which did

Figure 6. Intraoral view of dentures.

not allow any surgical intervention.[7] Also, the surgical elimination of flabby tissues was not performed due to the same reasons.

Numerous custom tray designs have been proposed to make impressions with minimal pressure.[8] As stated by Bindhoo et al[8] there is a general consensus on making impressions from remnant flabby ridges with minimal pressure. Due to the presence of flabby ridges in three different regions of the premaxilla, the custom tray was designed with the window technique such as to provide sufficient space for the resin material and to avoid deformation of the impression materials among three flabby regions.

Adverse effects of incorrectly planned and poorly adapted denture bases on denture bearing tissues are well known factors among clinicians.[9] In the present case, the previous dentures of the patient provided important clues in this regard. For instance, porcelain type artificial denture teeth (ADT) were used for the restoration of anterior edentulous region and resin type ADT were used for the posterior edentulous region in previous dentures. Additionally, it was determined that the borders of the denture bases were shorter than it should be; the upper complete denture was not adequately covering the tuber region and the flanges of the dentures were not extending through the vestibular sulcus. Moreover, it was observed that posterior borders of the lower partial denture were not covering the retromolar peds; especially the left edentulous region of the denture was nearly 2.5 mm short in the vestibular regions and there was a poor fit between the supporting tissues and denture base. However, it is not possible to predict that the reason of the poor fitting was inherent from inaccurate manufacture or from the resorption of the left mandibular ridge. As a result, it was aimed to fabricate new dentures covering all supporting tissues in order to prevent the existing problems originating from the old dentures, to protect the resorbed ridges and to minimize the resorption process. Therefore, the borders of the temporary denture base were extended as much as possible. However, the forces transmitted to denture bearing tissues are not only related with the dimensions of denture base but also with artificial denture teeth material, and their cuspal angulation.[10] Thus, a resin denture teeth with a highly cross linked chemical composition was used in the present study against the use of porcelain artificial denture teeth in order to minimalize the forces transfered to the denture base. Besides, existing studies demonstrated a relationship between the planned occlusal scheme and chewing efficiency with optimal force distribution onto denture bearing tissues.[11,12] Inoue et al[12] reported that the contact between maxillary lingual cusps and the central fossae of mandibular teeth could be easily achieved with the use of lingualized occlusion both in the working and nonworking sides. Thus, in the present case, the lingualized occlusion which provides direct contact between functional cusps and central fossae of artificial teeth was prefered for the optimal orientation of occlusal forces onto the residual ridges.[12] Jameson[13] reported that esthetic and functional requirements in CS patients could be optimally provided with also use of linear occlusal schema, however, not any data exists in the literature

demonstrating the positive effect of such an occlusal scheme to removable denture stability. Insipite of that, the positive effect of lingualized occlusal schema to denture stability was demonstrated previously.[12] Thus, in the present study, the lingualized occlusion was selected to increase the stability and to avoid the dislodgement of dentures which was one of the major complaints of the patient. It is not possible to deduce from the existing literature data that lack of denture stability affects the occurrence and magnitude of CS, however, it could be thought that maximum denture stability may be crucial to prevent the progress of the signs of CS.

After a follow-up period of 3 months, It was determined that all complaints and symptoms of the patient were eliminated with the prosthetic treatment modality described above in details.

The prosthetic treatment options used in the present edentulous state are actually well known and frequently applied techniques by clinicians. However, the distinctive characteristic of the present case was the portrayal of a rarely seen ABR. Similarly with other studies.[3,13] The Glossary of Prosthodontics Terms (7th ed)[14] describes the major morphological signs and the oral manifestations (enlarged tuberosities, ABR) of the CS as having a bilateral character on both sides of the patient's midline. The uncommon ABR described in the present case may be thought as being the unilateral version of the CS (Figures 7-9).

The critical question arising from the present case report could be weather the unilateral CS syndrome would occur in a similar resorption pattern in another patient with same oral conditions. Palmqvist et al stated that despite being frequently seen in daily clinical practice, the CS is rarely reported by researchers. Due to the rareness of the present case, the answer could only be given by contributions of similar future studies.

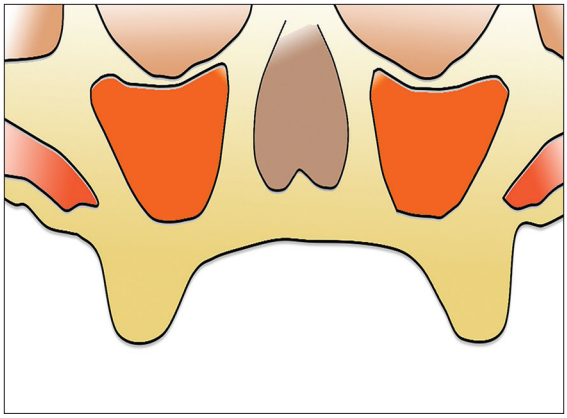

Figure 7. Illustration of frontal view of healty maxillar tuberosites.

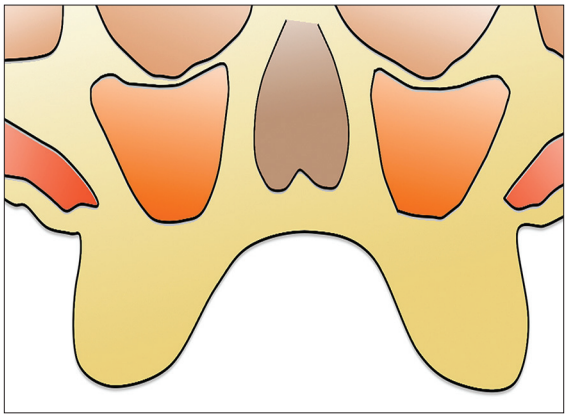

Figure 8. Illustration of frontal view of maxillar tuberosities in a CS patient.

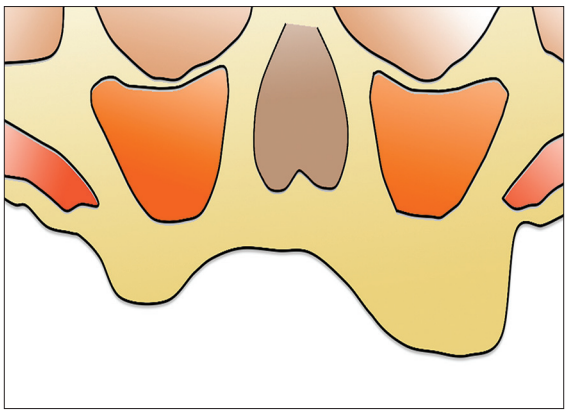

Figure 9. Illustration of frontal view of maxillar tuberosities in the present case.

Making precise impressions from flabby ridges and denture bearing tissues and application of lingualized occlusion

may positively affect the chewing ability and oral comfort of the patients suffering from excessive alveolar bone resorption that mimicking Combination Syndrome unilaterally.

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REFERENCES

1. Kelly E. Changes caused by a mandibular removable partial denture opposing a maxillary complete denture. J Prosthet Dent 1972;27:140-150.
2. Palmqvist S, Carlsson GE, Öwall B. The combination syndrome: a literature review. J Prosthet Dent 2003;960:270-275.
3. Shen K, Gongloff RK. Prevalence of the combination syndrome among denture patients. J Prosthet Dent 1989;62:642-644.
4. Salvador MCG, do Valle AL, Riberio MCM, Pereira JR. Assessment of the prevalence index on signs of combination syndrome in patients treated at Bauru School of Dentistry, University of Sao Paulo. J Appl Oral Sci 2007;15(1):9-13.
5. Klemetti E, Lassila L, Lassila V. Biometric design of complete dentures related to residual ridge resorption. J Prosthet Dent 1996;75:281-284.
6. Tymstra N, Raghoebar GM, Vissink A, Meijer HJA. Maxillary anterior and mandibular posterior ridge resorption in patients wearing a mandibular implant-retained overdenture. J Oral Rehabil 2011;38:509-516.
7. Carlsson GE. Clinical morbidity and sequelea of treatment with complete dentures. J Prosthet Dent 1997;79:17-23.
8. Bindhoo YA, Thirumurthy VR, Kurien A. Complete mucostatic impression. A new attempt. J Prosthodont 2012;21:209-214.
9. Mori S, Sato T, Hara T, Nakashima K, Minagi S. Effect of continous pressure on histopathological changes in denture-supporting tissues. J Oral Rehabil 1997;24:37-46.
10. Arksornnukit M, Thitima P, Takahashi H. Pressure transmission and distrubution under denture bases using denture teeth with different materials and cuspal angulations. J Prosthet Dent 2011;105:127-136.
11. Ohguri T, Kawano F, Ichikawa T, Matsumoto N. Influence of occlusal scheme on the pressure distrubition under a complete denture. Int J Prosthodont 1999;12:353-358.
12. Inoue S, Kawano F, Nagao K, Matsumoto N. An in vitro study of the influence of occlusal scheme on the pressure distribution of complete denture supporting tissues. Int J Prosthodont 1996;9:179-187.
13. Jameson WS. The use of linear occlusion to treat a patient with combination syndrome: A clinical report. J Prosthet Dent 2001;85:15-9.
14. The Glossary of Prosthodontic Terms. J Prosthet Dent 2005;94:10-92.

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