Journal of Dental Applications

Open Access

Austin Publishing Group

Case Report

Maxillofacial Discrepancy: Effective Surgical and Prosthetic Treatment using Immediate Complete Denture

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Received: September 09, 2014; **Accepted:** December 27, 2014; **Published:** January 21, 2015

Abstract

This report describes the case of a 62-year-old white female, was referred to the Total Denture Clinics (School of Dentistry at the State of São Paulo University - ICT-UNESP) complaining about the appearance and function of her upper and lower prostheses. Clinical examinations showed excessive wear of the artificial teeth with an occlusal misalignment of the lower total denture; and the upper partial prosthesis (UPP) presented retention failures and a huge destruction of the remained artificial teeth. After clinical and radiographic examinations, the suggested treatment was the confection of a new inferior total denture and an immediate upper one. Our clinical findings from this patient indicate that an elderly patient with significant maxillo-mandibular discrepancy, showing a severe maxillo-facial discrepancy, needs a good evaluation of the facial asymmetries to avoid the final aesthetic results compromising and the good acceptance of the prosthesis by the patient. A suitable and comfortable surgical and prosthetic approach, combined with a sound and planned surgical procedure, promoted a predictable re-establishment of immediate function/aesthetics, overcoming all initial difficulties.

Keywords: Aesthetics; Elderly edentulous rehabilitation; Immediate complete denture; Patient satisfaction

Abbreviations

ICT: Institute of Science and Technology; **UNESP:** State of São Paulo University; **UPP:** Upper Partial Prosthesis; **CR:** Central Relation; **OVD:** Occlusal Vertical Dimension; **ICD:** Immediate Complete Dentures; **SS:** Stomatognathic System; **OR:** Occlusal Relation; **RRR:** Residual Ridge Resorption

Case Presentation

A 62-year-old white female, was referred to the Total Denture Clinics (School of Dentistry at the State of São Paulo University - ICT-UNESP) complaining about the aesthetics and function of her upper and lower prostheses (Figures 1A and 1B). Clinical examinations showed excessive wear of the artificial teeth with an occlusal misalignment of the lower total denture; and the upper partial prosthesis (UPP) presented retention failures and a huge destruction of the remained artificial teeth. In the upper arch there was moreover an expressive maxillary projection joined to an occlusal collapse with dental and bone extrusions (Figures 1C, 1D and 1E). An orthopantograph of the patient revealed bone loss in maxillary anterior region up to the middle thirds of the roots and teeth mobility (Figure 2). After clinical and radiographic examinations, the diagnosis made was the extraction of teeth #11, #12 and #13. The prosthetic treatment was proposed as the confection of a new inferior total denture and an immediate upper one. The protocol of the study has been approved by the ethical review board of the School of Dentistry at the State of São Paulo University - ICT-UNESP, at which the study was conducted.

Impression procedures

Initial impressions of mandible and maxilla were made with irreversible hydrocolloid for the construction of study casts with Type II common plaster for the panoramic view of case study,

Figure 1: Initial profiles of the patient. (A to E)
Clinical question: From (A) and (B), is there a good maxilla facial relationship between the upper and lower prosthesis? From (A) a frontal view and (B) Intra-oral view of the occlusal relationship of the prostheses at the beginning of the treatment, it is clear that there is a maxillary projection, highlighted in (C) sagital view of the patient, and dental and ridge extrusions, highlighted in (D) intra-oral view of the patient without the prostheses. In (E) it is possible to confirm it from the initial lateral profiles of the patient.

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Figure 2: Orthopantomograph (OPG) of the patient.
Clinical question: How the OPG findings could help on the diagnostic and treatment choice in this case? The OPG showed a good maxillary bone support at the posterior region, but the anterior teeth presented mobility and apical lesions that could affect the performance of a partial prosthetic rehabilitation, which lead the clinicians to an immediate denture treatment choice.

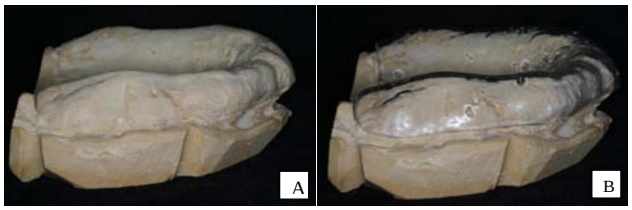

Figure 3: Superior model cast and the acrylic surgical guide.
Clinical question: Which type of gypsum is used to make the working model cast? The working casts were obtained with special type IV plaster.

allowing the correct diagnostic, basal area orientation and base for the individual tray. The functional impression was obtained by using polysulfide elastomeric material (mercaptan) and the working casts were obtained with special type IV plaster (Figure 3A). The basal area was then outlined following the same total denture procedures with the exception of contouring the remained teeth at the anterior region along the cervical palatine contour, respecting the clinical crown limits. An upper acrylic baseplate (Figure 3B) was made with chemical activated acrylic resin following the cast limits to allow the construction of the wax occlusal rims (Figure 4), re-establishing the maxillo-mandibular references and the set-up the CR position in a semi-adjustable articulator. The upper wax occlusal rim allowed the occlusal adjustment of the anterior region from canine to canine and the posterior region from canine until the tuberoses was parallelized in accordance to the Camper plan.

Facial arch register, wax occlusal rims and mounting teeth

With the hand of a facial arch the maxillary model was transferred to the articulator. The lower baseplate and the waxing were made and position in mouth for the OVD establishment. This stage was difficult due to the anatomic difference between the ridges. The CR was obtained by deglutition. After joining the wax occlusal rims with the CR, the laterality (right and left) and protrusion were obtained using the rims for individualizing the Bennett left and right angles and the condilar guide respectively.

The upper wax occlusal rim, median line, smile line and canine lines (left and right) were outlined. The presence of remained teeth facilitated the shape and color choices of the teeth for the immediate denture. After the mounting teeth, the dentures were checked intraorally to verify the correct OVD, aesthetics, phonetics and the physiognomic re-establishment of the patient. In a final phase, the remained teeth of the model were removed and this region of the

Figure 4: Upper and lower wax rims in intercuspidation position.
Clinical question: What wax rims are made for? Wax rims can re-establishing the maxillo-mandibular references and the set-up the CR position in a semi-adjustable articulator. The upper wax occlusal rim allowed the occlusal adjustment of the anterior region from canine to canine and the posterior region from canine until the tuberoses was parallelized in accordance to the Camper plan.

maxilla was adapted to allow a better anterior relation between the arches. This step differed a little from the conventional technique in which the teeth are eliminated individually and then the artificial ones are positioned. The model was duplicated and a surgical guide was made. Subsequently, the inclusion, polishing and finishing of the prostheses were made.

Surgical steps and prosthesis installation

The surgical step was consisted by a corrective alveolotomy after teeth extractions, exceeded tissue removing, adaptation of the surgical guide, and the suture of the alveolus. In Figure 5A to 5E, the clinician is correcting the alveolar bone by flattening it with a prosthetic bur in low-speed and irrigation; in C exceeded tissue was

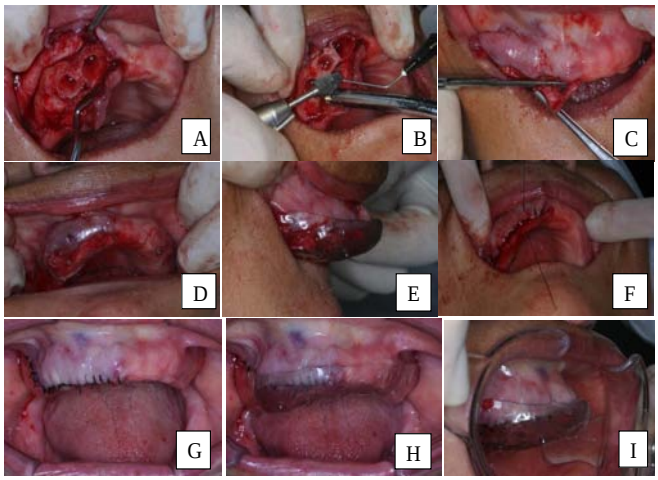

Figure 5: Surgical sequence of the corrective alveolotomy after teeth extractions, exceeded tissue removing, adaptation of the surgical guide, and the suture of the alveolus.
Clinical question: Why the alveolotomy is so fundamental in a case like this one? The alveolotomy allows the ridge to be corrected, providing the prosthesis much more stability and avoiding a resorption progression of the ridge. From A to B, the clinician is correcting the alveolar bone by flattening it with a prosthetic bur in low-speed and irrigation; in C exceeded tissue was removed and in D-E the surgical guide is used to check the pressure zones that could affect the prosthesis stability; F-G is showing the suturing and the healthy aspect of the ridge after surgery and H-I is showing the final checking for stability by the contour of the ridge + soft tissue after suturing.

Figure 6: Was the treatment successful on decreasing the protrusion and the discrepancy between the upper and lower prostheses? From the front and lateral views of the case reported: initial (A and C) and final (B and D), it can be seen that the treatment reestablished the maxilla facial harmony to the patient.

removed and in D-E the surgical guide is used to check the pressure zones that could affect the prosthesis stability; F-G is showing the suturing and the healthy aspect of the ridge after surgery and H-I is showing the final checking for stability by the contour of the ridge + soft tissue after suturing. The finishing step was the installation of the immediate denture itself. The patient was given postoperative home care instructions, which include: not removing the denture for 24h, the use of analgesics and ice packs, if necessary.

At the first clinical session, the prosthesis presented a good initial stability and for this reason the relining with soft materials was not necessary as well as any occlusal adjustments. The patient was oriented to do not remove the prostheses in the first 24 h and to rigorously follow the post-operative recovering protocol. In the second session, 24 h after the first one, the hygienezation and a mucosa trauma inspection were made. A week after the first session, the sutures were removed and the first occlusal adjustments were made: First in open-close movements and then with posterior eccentric ones. The patient was satisfied at the end of the treatment (Figure 6A-6D) and she was oriented to progressively return to her normal diet routine.

Discussion

Immediate complete dentures (ICD) has many advantages such as: the stomatognathic system (SS) equilibrium maintenance by the immediate replacement of the remained teeth, preserving the patient's occlusal vertical dimension (OVD), the central (CR) and occlusal (OR) relationships [1]. It also promotes a better post-operative period for the patient [2], protecting the surgical lesions, a shorter period for changing the diet and the possibility of mounting teeth in an identical position of the remained teeth.

Residual ridge resorption (RRR) is the primary intraoral complication of complete edentulism [3] and the use of ICDs helps re the decrease of the alveolar bone resorption in the first 3-4 months after the teeth extraction. The major difference between ICDs and conventional prostheses is actually the basal area condition, the fibromucosa and the bone tissue at the moment the dentist initiates the prosthesis construction [4], a lot of criterion is need for its construction and installation when compared with the conventional prosthesis as the accuracy is naturally compromised.

It is still considerably significant the number of people with the indication of extraction of all remained teeth/roots followed by total denture rehabilitation. One of the factors that deserve attention for an ICD is the patient's consciences of the huge life change after this long extraction procedure and the prosthesis installation. To know how to identify the real patient's needs becomes a challenge for the dentists as there are several options for this type of rehabilitation up to date.

The indications and non-indications of the ICDs depends upon the age, the general health state, psychological favorable conditions, and periodontopaties, when in an advanced stage, are the major indications for this treatment. Those would be not indicated in patients subjected to radiotherapy, as the use of the total denture would generate osteoradionecrosis and your indication is also limited for diabetic, cardiac, hemophilic and mind-affected patients as well as any other with a deficiency in health [5]. The corrective alveolotomy after teeth extractions, exceeded tissue removing, and the adaptation of the surgical guide were fundamental for the success of this clinical case as due to the advantage of the patient on having a good maxillary bone support, allowed the clinician to remodeled the ridge, but still provided enough thickness and height for a stable future prosthesis. The suturing step is sometimes neglected by the clinicians but in this case it was showed that a good suturing can lead to a very satisfactory post-operative condition as well as diminishes the risk of infection between the clinical sessions.

In this study, the anamnesis played a very most important role. The medical and oral history of the patient included the report of the dental loss progression, the reasons all those extractions and also possible previous experiences using a prosthetic device, total or partial, removable or fixed. Although there is no difference between a patient with and without a previous use of prostheses, mainly the total one, it is believed that this experience can decrease the expectation of the patient and moreover be favorable in a 'previously-trained' neuro-muscular system, facilitating the adaptation of the prostheses and improving the patient satisfaction face to the treatment.

A good evaluation of the facial asymmetries avoided the final aesthetic results compromising and the good acceptance of the prosthesis by the patient. In this case report, there was an initial difficulty on re-establishing the aesthetic profile of the patient due to two major factors: (1) the accentual maxillo-mandibular discrepancy (with the maxilla anterior projection) and (2) the occlusal collapse that generated protrusion of the upper anterior remained teeth accomplished by the buccal bone tab.

For achieving a good prosthetic planning, a detailed evaluation including all oral health conditions needs to be done. The final aesthetic result in elderly edentulous patients, such as the case reported in this manuscript, involves the replacement of loss tissues and teeth after extraction, the correction of the OVD and the correct artificial teeth selection. More than a clinical procedure, the rehabilitation with a ICD is a master piece in Dentistry as it promotes the patient not only a tissue and organ replacement but a new social life with more receptive environments, and a better quality life, attending the aesthetic and functional needs with a fundamental recover of the dental loss psychological obstacles.

Conclusion

The favorable interrelationship between the surgical and prosthetic stages allowed that all patient expectation were attended, regardless the complexity of the clinical procedures, re-establishing the aesthetic and function reported by the patient satisfaction.

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J Dent App - Volume 2 Issue 2 - 2015
ISSN : 2381-9049 | www.austinpublishinggroup.com

Citation: Saavedra GSFA, Kimpara ET, Borges ALS, Shoji AV, Rodrigues FP and Paes-Junior TJA. Maxillofacial Discrepancy: Effective Surgical and Prosthetic Treatment using Immediate Complete Denture. J Dent App. 2015;2(2): 164-167.