Case Report

MODIFICATION OF THE OCCLUSION OF A REMOVABLE PROSTHESIS IN THE ORAL CAVITY IN AN ONCOLOGY PATIENT: A CASE DESCRIPTION

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ABSTRACT

The evolution of prosthetic dentistry with the help of new technologies has made it possible to resolve clinical cases by reducing complications and the timing of interventions. The use of materials and tools present in a dental practice allows you to intervene immediately and expand interventions on patients' prostheses in extreme cases. The presented case of the occlusal modification of a removable prosthesis was solved with a traditional technique in a single appointment, reducing the discomfort of the fragile patient.

KEYWORDS: *removable prosthesis, acrylic resin, occlusion, bisphosphonates, oncology patient*

INTRODUCTION

Prosthetic dentistry is the branch of dentistry that deals with the restoration and maintenance of masticatory functions by re-establishing the patient's oral health. The correct relief of the occlusal contacts on models mounted in the articulator is of fundamental importance in the construction of a dental prosthesis. The evolution of technologies in the dental field has made it possible to create even complex prosthetic products, facilitating the dentist in planning and carrying out prosthetic rehabilitation by reducing work times and better managing patient compliance (1-3).

New technologies have also had exponential growth in the pandemic period with all the precautions of single-use, avoiding some laboratory steps, and reducing visits to the clinic (4). The factors that must be considered for prosthetic rehabilitation are mechanical, biological, and psychological and must be understood and adapted for personalized treatment to obtain pleasant aesthetic results (5, 6). It is precisely the biological factors in adults and elderly subjects that often influence therapeutic choices, eliminating the possibility of using implant systems that would improve the masticatory biomechanics and the psychological state of the patient who, as a consequence, finds himself undertaking therapies aimed at the accurate maintenance of the teeth residues to have greater occlusal stability (7-9).

Systemic factors can be decisive in the choice of oral rehabilitation, such as neoplasms based on the site of onset, grade, and stage; surgical, chemo or radiotherapy therapy can be chosen, or a combination of these in a synchronous manner, as well as syndromes or lesions high-risk oral infections influence the dentist's choice in proposing a solution for the patient (10-15). The management of cancer patients presents multiple challenges, particularly when these patients take bisphosphonates (16, 17). Although widely used as these drugs inhibit bone resorption, they can significantly impact oral health by interfering with the healing response after dental surgery (18-20). Therefore, It is necessary to carefully

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evaluate the medical history and pharmacological therapy before prosthetic rehabilitation on patients at risk, suggesting a multidisciplinary approach to medical oncologists and other specialists.

Completely edentulous cancer patients often need to have a dental prosthesis or, if they have been edentulous for many years, to replace the old, worn prosthesis with a new one to have greater stability and comfort. Therefore, in addition to the oral clinical examination, it is necessary to evaluate the medical history and current pharmacological therapy (21, 22). The case we presented concerns a chairside operation to re-establish the correct occlusion in an oncology patient with pulmonary metastases who, in addition to chemotherapy and radiotherapy, takes bisphosphonates.

CLINICAL CASE

Presentation of the case

A 63-year-old male patient comes to our observation complaining of chewing difficulties. The medical history highlighted a previous operation in March 2023 on the colon for cancer and the presence of a lung tumor, which he treated with chemo and radiotherapy in addition to taking bisphosphonate drugs. On intra-oral examination, the patient had partial upper edentulism; only 1.1 – 2.1 – 2.2 were present, and a total lower edentulism. The patient appeared visibly exhausted, very thin, and weak. It was of fundamental importance to speak to his wife, who accompanied him as she reported that although the prostheses were new, made about 14 months ago, he was not wearing them because he was unable to chew the soft food, and the oncologist had suggested redoing or adjusting it to allow correct nutrition.

Planning of the intervention

The prostheses showed no lesions or superficial alterations, were inserted into the oral cavity, did not wobble, and adhered perfectly; the residual elements were visibly structurally compromised. The oncologist's opinion provided by the patient categorically prohibited any surgical or other intervention (root canals) on the remaining teeth. The patient only requested to modify the prostheses as quickly as possible, avoiding multiple appointments. Therefore, in agreement with the patient, it was decided to modify the occlusion using a technique that involves detaching the elements that are not included to reposition them correctly in occlusion directly in the chair to avoid a subsequent appointment.

Modification of the occlusion

The intervention to modify the occlusion involved using pink self-polymerizing acrylic resin, the Fox plane, the straight laboratory handpiece with the relevant cutters, and polishing rubbers as materials.

The choice of the occlusal modification of the prostheses fell on the lower one since the upper prosthesis, evaluated with the Fox plane, did not present both frontal and lateral alterations. The elements, therefore, to be repositioned in occlusion were 4.5-4.6-4.7. We initially removed the elements under occlusion using the straight handpiece with a ball bur, carefully removing them all together (Fig. 1).

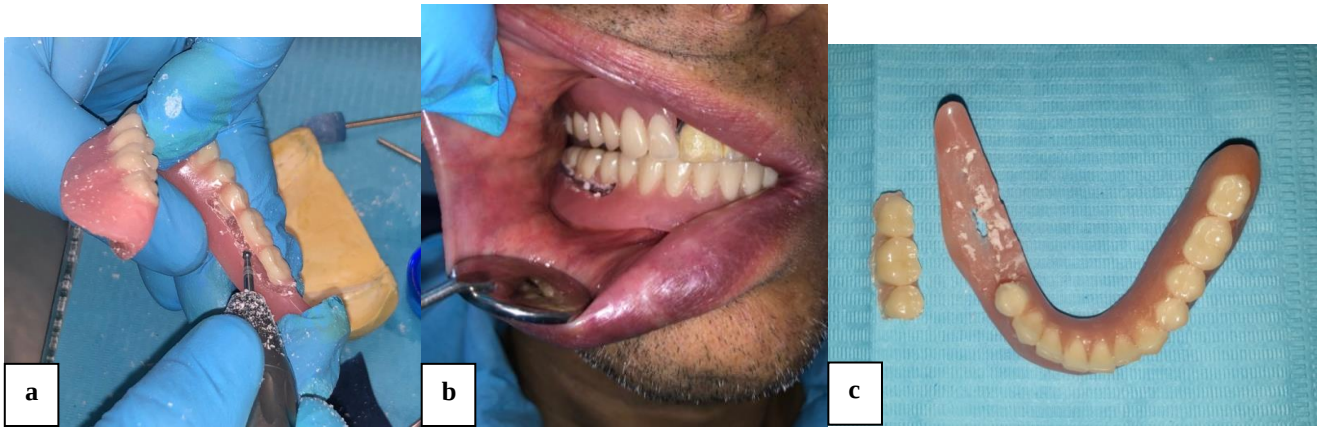

Fig. 1. ***a****): Lingual view of the sulcus for the removal of 4.5-4.6-4.7;* ***b****): Intra-oral view of the incorrect occlusion of the lower elements;* ***c****): Detachment of the joined elements 4.5-4.6-4.7.*

The phase following the detachment of the elements was to prepare the acrylic resin to position it in a rubbery state between the base and the detached teeth, being careful not to create steps between 4.4 and 4.5, placing everything in the patient's mouth, asking him to close slowly to check the occlusion. Once the polymerization was completed, the excess resin was removed and finished with polishing rubbers (Fig. 2). The result is immediate and visible even for the patient who immediately perceives the posterior contacts, the only small defect of this technique is the color of the self-polymerizing acrylic resin (Fig. 3).

Fig. 2. *Correct prosthesis in occlusion.*

Fig. 3. *Repositioning of elements 4.5-4.6-4.7 shows the slightly lighter color of the acrylic resin inserted for the occlusal modification.*

DISCUSSION

Over the last twenty years, the prevention of oral pathologies and the continuous prevention campaigns carried out by various trade associations have played an important role in raising patient awareness. This result can be seen as the number of young people going to the dentist has increased at the slightest discomfort or at the slightest change in color or stain on the teeth. Caries and periodontal disease are the most prominent causes of partial or total edentulism. New technologies help us a lot in the prevention and rehabilitation of the oral cavity by significantly reducing any extraction surgery, the healing times of the tissues, and the choice of the type of prosthesis to be performed, obtaining results that increasingly lead to the maintenance of one's teeth or implants (23, 24).

Leonida et al., in recent works, have demonstrated how the use of synthetic melatonin in powder form and with new techniques in complex cases or distal edentulism, through the use of new techniques the surgical procedure for bone regeneration becomes more predictable, obtaining excellent results for rehabilitation implant-prosthetics (25, 26). One of the problems that creates concern and difficulty in choosing rehabilitation in the field of implant prosthesis is the use of bisphosphonates (27-29). The association between oncological therapy and the use of bisphosphonates directs the dentist toward removable prosthetic rehabilitation, which allows the most rigid control of the oral tissues. In the case we treated, the two therapies, oncological and bisphosphonates, were in place, and the new technologies would not have given the right support in a short time. A new technology that could be used in cancer patients who are also taking bisphosphonates or monoclonal antibody therapy is the use of a laser in reducing pain or adjuvant in periodontal therapies.

Caccianiga et al., in recent studies, have demonstrated how photodynamic therapy and laser can have positive results in improving the pain perceived by the patient and in bacterial decontamination in cases of peri-implantitis (30, 31). The majority of adult and elderly cancer patients who present total or partial edentulism compensated with inappropriate removable prostheses, often also due to the pandemic effect of COVID-19 or objective difficulties, tend to postpone the need for treatment for prosthetic dental problems, increasingly reducing using the prosthesis for chewing and wearing it only for aesthetics (32). The clinical case presented showed, in addition to the chewing difficulties, also an important systemic condition that influenced his choice to contact the dentist. Using materials and equipment easily available in any dental practice has allowed us to solve the occlusal problem quickly without inconveniencing the patient by leaving the prosthesis or scheduling another delivery appointment.

Aesthetics in frail subjects wearing removable prostheses are also important because they affect their communication and social aspects (33).

CONCLUSIONS

In conclusion, we can state that although new technologies help us in procedures by also reducing the processing times of prosthetic products, some traditional techniques are quicker and more immediate when the systemic conditions of the fragile patient are important.

Institutional Review Board Statement

The study was conducted in accordance with the Declaration of Helsinki.

Declaration of informed consent

The patient signed the written consent form, which is required by law, for the modification of the prosthesis, which also includes the iconography.

Conflict of interest

The authors declare that there was no conflict of interest in the study.

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