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CASE REPORTS

PROSTHETIC SOLUTION FOR RESTRICTED POSTERIOR VERTICAL SPACE IN CONVENTIONAL COMPLETE DENTURE TREATMENT CASE REPORT

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Abstract. The case described in this paper presents the benefit of metal castings over the tuberosities and retromolar pads in complete dentures. The patient is 46 years old, female, and she has been wearing the same complete dentures for 4 years. The old complete dentures showed an overvalued occlusal vertical dimension and the patient complained of headaches, clicks, discomfort and important diet changes. The replacement of the old dentures with the new ones made in a correct vertical dimension increased the comfort and made the pain disappear. The overestimated occlusal vertical dimension was corrected by the new complete dentures made with metal castings over the tuberosities and pads.
Keywords: tuberosities, retromolar pads, restricted vertical space, metal castings

Introduction

The registration of a diagnostic centric relation record will give the operator important information relative to the space available between tuberosities and the retromolar pads. After establishing the correct vertical dimension it is possible to find that at the desired height there isn't enough space for conventional complete denture bases. One solution to this problem is to fabricate metal castings [1] only in the tuberosities and retromolar pads area since they can be much thinner than the acrylic denture base material.

Increasing the vertical dimension in order to create adequate space means encroaching on the normal interocclusal space and the dentures are doomed to failure. In this specific case the patient accused discomfort and pain and used the old dentures only in social situations. She feared to accept a surgical procedure on the tuberosities in order to reduce the height and thickness and to create adequate space. Ending the mandibular denture short of the retromolar pads is a generally not successful option [2]. Finally, she was offered the possibility to fabricate new dentures with metallic tuberosities and pads and she accepted.

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Case presentation

In this case a 46 year-old female patient came to the office with a pair of complete dentures that she wanted to change. These dentures presented an overvalued occlusal vertical dimension (VDO) [3] (fig. 1) and the patient complained of headaches, clicks, discomfort and important diet changes. She had been wearing them for the past 4 years, only in social situations; whenever possible, she avoided eating with the dentures. We noticed the inflammation of the supporting attached mucosa as a result of the malocclusion [34] (fig. 2) and the overvalued VDO. The centric occlusion was not coincidental with centric relation and the dentures were unstable during function.

We used the usual tests to establish the correct VDO by means of occlusion rims: judgment of the overall facial support, visual observation of the space between the rims when the jaws are at rest, measurements between dots on the face when the jaws are at rest and when the occlusion rims are in contact, observation when the „s" sound is enunciated accurately and repeatedly – the average speaking space. The last test ensured that the occlusion rims came close together but did not

contact. The first and second tests were effective particularly because we used the patient's old dentures for comparison (fig. 3). The old dentures were also valuable for prognostic purposes. In the new established VDO, the centric occlusion is coincidental with centric relation in order to ensure the chewing stability of the dentures.

Another important aspect of the centric relation record was to evaluate the space available between the tuberosities above and the retromolar pads below, since it was impossible to visualize this in the mouth (fig. 4). When we established the correct vertical dimension of occlusion we found that at the desired height there was insufficient room for the acrylic denture base material [5] between the tuberosities and the pads, especially on the right side of the patient. The old dentures increased the VDO to create this space and made the patient unable to use them on a daily basis, since she could not stand the lack of comfort. We chose to fabricate metal castings to the tuberosities and the right pad since they would be much thinner than acrylic denture base material and thereby sufficient space can be achieved.

Figure 1. The facial aspect of the patient wearing the old dentures

Figure 2. The inflammation of the supporting attached mucosa

Figure 3. The occlusion with the old dentures

Figure 4. The occlusal rims mounted in the articulator _ left and right side views of the available space

We modified the old dentures, corrected the malocclusion and lowered the existing VDO successively in 4 appointments. The final impression was taken when the tissues were healthy. The patient was instructed not to wear the old dentures for 24 hours before the impression was taken, to ensure a complete tissue rest. She was also told to maintain a good oral hygiene by brushing the tissues with a soft brush and by using rinsing solutions.

On the master cast the dental technician outlined the form of the castings for the tuberosities and the right pad and adapted inside these contours a layer of blue wax of 0.4 mm. Then he used modeling wax to get to a 0.8 mm thickness and wax grid retentions all around in order to ensure a good mechanical attachment between the metal casting and the acrylic base (fig. 5). The margins of the retentions had a step of 0.4 mm - the finishing line for the acrylic resin [6]. There was no need to duplicate the master cast. The wax patterns were removed from the model, the wax sprues were added and the pattern was put on a cone former.

After the casting and devesting of the three pieces made from cobalt chromium, the technician used the hand-piece mounted instruments to finish and polish them (fig. 6). The thickness of these pieces can be reduced in the restricted vertical space areas to 0.3 mm. There is no need for these casts to be tried in the mouth. The metal tuberosities and pad were fitted directly to the master cast, glued in the correct position and included in the trial denture bases after the mouth try-in appointment (fig. 7). The final dentures were made and delivered (fig. 8).

At the delivery appointment we checked carefully the areas of contact between the bases of the dentures and the supporting tissues and the occlusion. After the occlusal equilibration the dentures were polished again. The instructions regarding

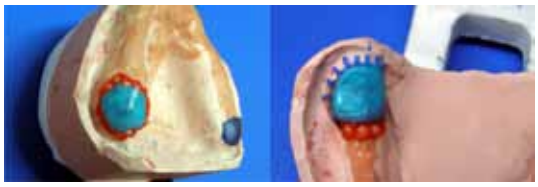

Figure 5. The wax-up of the tuberosities and of the right pad on the master cast

Figure 6. The cobalt chromium casted tuberosities and pad

Figure 7. The metal tuberosities and the metal pad included in the maxillary trial denture

Figure 8. The final complete dentures

home care and oral hygiene were reemphasized and the patient was dismissed. The first recall appointment was 24 hours later and there was no sign of any irritations of the mucosa. During the next 2 weeks only minor adjustments were necessary. At each subsequent recall appointment the continued absence of inflammation to the supporting mucosa was an indication of a satisfactory service, as much as the patient's opinion regarding function, comfort and esthetics (fig. 9).

Results and discussion

When the vertical space for the denture components is dramatically restricted, the solution may involve increasing the vertical dimension of

Figure 5. The wax-up of the tuberosities and of the right pad on the master cast

occlusion, making a metal base denture or surgically reducing the size of the tuberosities [7]. All of these methods have significant disadvantages. The complete denture base materials are usually made from polymethylmethacrylate, which is the material of choice but which requires sufficient bulk for durability. This fact can lead to the increase of the VDO and the diminution of the free-way space. Also, the construction of a complete metal base denture can result in a decreased retention and in an expensive, heavy and harder to maintain prosthesis. The surgical procedures are sometimes unacceptable to the patients for various reasons. To avoid the disadvantages of the above list, this article describes an alternative solution using metal tuberosities and pads made from cobalt chromium and incorporated into polymethylmethacrylate denture base opposing the areas where the space is restricted. These castings are thin in cross-section but very strong [8]. Therefore, there will be no changes over time in what the resistance of the denture is concerned. The technique avoids potentially invasive treatment and is easy to carry out clinically and technically. Our experience shows that this method represents a valuable treatment option for many patients. Because of the mechanical retentions, the margins of 0.4 mm and the finishing line which ensures the necessary thickness for the acrylic resin on both sides, the resistance of the mechanical bond between the acrylic base and the metal castings is very good. The only problem to mention is that these metal castings cannot be relined. There have

been no failures recorded using this method over a period of 8 years.

The replacement of the old dentures with the new ones made in a correct vertical dimension increased the comfort and made the pain disappear. The patient was able to wear the dentures without any sign of discomfort.

Conclusions

The use of cast tuberosities and pads is not a complicated or expensive procedure and will provide certain advantages to some patients. This can be a valuable technique among other procedures available in fulfilling the requirements of comfort, function and satisfaction for the patients. No special clinical techniques or appointments are required and a significant increase in laboratory costs is unlikely when the method is used.

The overestimated occlusal vertical dimension was corrected by the new complete dentures made with metal castings over the tuberosities and pads. The occlusion established provided a functional and esthetic restoration.

References:

1. **Omprakash YV, Hallikerimath RB, Gangathar SA.** A new technique to locate the external finish line in metal base maxillary denture: A clinical report, *The Journal of Indian Prosthodontic Society,* **2006;6,194-98.**
2. **Beresin VE, Schiesser FJ. T**he neutral zone in complete and partial dentures, *Mosby,* **1978;40-42,105-08.**
3. **Drummond J, Maillou P, Smith KT, Yemm R.** A usefull solution to a space problem – a striking plate, *Dent Update* **2003;30:269-70.**
4. **Zarb GA, Bolender CL.** Prosthodontic treatment for edentulous patients, *Mosby,* **2004, 263-67.**
5. **Belfiglio EJ.** Using metal bases in making complete dentures, *J. Prosthetic Dentistry* **1987;58:314-17.**
6. **Tomlinson K, Turner CH.** A post-dam technique for metal-based complete maxillary dentures, *Dental Update,* **1984;nov-dec:655-56.**
7. **Mc Cord JF, Grant AA.** A clinical guide to complete denture prosthetics, *British Dental* **Assoc., 2000.**
8. **Lang BR. T**he use of gold in construction of mandibular denture bases, *J. Prosthetic Dentistry,* **1974;32:398-404.**