

THE EFFECT OF RELINING ON THE FIT AND STABILITY OF COMPLETE DENTURES -AN IN VITRO AND IN VIVO STUDY

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SUMMARY:

A technique for estimating in vitro the accuracy of denture bases , using a low-viscosity impression material for determining the space between the die and the dentures upon it was developed.

The measurements showed that relining denture bases with autopolymerizing acrylic resin improved their adaptation to the ridges.

The in vivo study showed no statistically significant change in stability after relining , but the trend was toward increased stability with the relined dentures.

Key words: relining, denture base

INTRODUCTION:

One of the main goals of complete dentures construction is to achieve denture base that best fits the underlying tissues. The assumption is that the more exact the denture is, the more stable it is. Some prosthodontists think that denture fitting will be largely improved if just before insertion into the patient's mouth, the ready dentures are rebased with self-polymerizing resin.

TASKS:

a/ To find out whether the rebased denture is more accurate than the denture we take out of the mold just before the end of the polymerizing process.

b/ To evaluate if the denture's better fitting also leads to improvement in its stability during usage.

METHODS AND MATERIALS:

In vitro study

Two working moulds were cast in hard plaster for each of the 5 taken functional impressions.

We made a wax model on one of the working moulds and aligned the teeth in the usual manner. Then we packed; rinsed the wax in hot water and mixed acrylic resin "Superacryl – Spofa Dental", according to manufacturer's instructions. We pressed and put the cuvettes in water. We strictly observed the requirements for heat polymerization. We opened the cuvettes and carefully polished the ready

dentures.

We measured the dentures precision by applying silicone material with low viscosity "Xantopren-Kluzer" on the denture base and pressed it to the hard plaster mould which was not destroyed during packing of the cuvettes. The gap between the denture base and the plaster mould was evaluated by the quantity of impression material left (pic 1).



Pic. 1.

In order to achieve reliable results we had to carefully standardize the procedures. Each stage was completed at a definite time after the material mixing was started. Equal proportions of base and catalyzer were used. The impression material was evenly spread on the denture base. One minute after the start of mixing: the denture together with the silicone impression material were put on the plaster mould and static pressure of 2.5 kg was exerted. We attentively removed the impression. After the end of the polymerizing process, the silicone material was carefully removed and weighed on analytical balance (pic. 2,3). The whole procedure was repeated for the rest of the dentures.



Pic. 2.



Pic. 4.



Pic. 3.



Pic. 5.

The five dentures were rebased with self-polymerizing resin “Duracryl - Spofa Dental” (pic. 4) after we had removed 1mm from the side of the dentures that is in contact with the mucosa. We attentively removed the waste and waited for the final polymerization of the resin. Denture fitting was checked on the mould in the same way – by the quantity of the impression material between the two.

Visual evaluation of the quantity and the measured weight of the impression material show that adaptation of ready acrylic resin dentures is quite good.

An insignificantly small gap was observed even in the distal areas. However, statistically, there is almost no difference in dentures fitting before and after their being rebased (pic.5, 6).



Pic. 6.

In vivo study

We determined the dentures stability subjectively by asking our patients to chew a hazelnut until a swallowing reflex appears. They had never worn completed dentures before. Dentures were given to them only for the time of the study and were then taken back and kept in water. Studies were conducted in 3 consecutive days at one and the same time of day in order to avoid patients' "getting used" to the dentures and to have as reliable results as possible.

RESULTS:

In vitro study:

The quantity of impression material between the denture and the plaster mould is shown in pic. 1. Because it is actually equal to the gap between them, it means that the smaller the gap, the better the denture fits.

Values show that rebased dentures fit better than the ones that are not rebased. The quantity of impression material shows that the gap between the base and the mould with non-rebased dentures is almost twice bigger in comparison with rebased ones.

In vivo study:

Results from the In vivo study show a tendency of decreased moving of dentures in the vertical plane, according to patients' reports. However, there is no statistically significant difference in vertical movements of dentures.

CONCLUSIONS:

Laboratory data clearly show that better fitting of dentures can be achieved by rebasing the ready dentures just before their final insertion.

In vivo studies did not show any significant difference in dentures stability after their being rebased. In spite of this, some patients reported certain improvements after the rebasing. The statistically insignificant difference can be attributed to the comparatively small number of patients we studied (only 5 people). Probably, if a larger group of people is involved, this could lead to bigger statistical differences in favour of retention improvement. Another possible reason could be the fact that during the polymerizing process acrylic resin shrinks. This leads to certain discrepancies between the denture base and denture plane, hence unsatisfactory retention. To compensate this fact to some extent, it is recommendable to use the indirect method of rebasing every time it is possible.

REFERENCES

1. Mc Mordie R, King GE. Evaluation of primers used for bonding silicone to denture base material. *J prosth dent* 1989; 61: 639-9
2. Miserandino LJ, Pick RM. *Lasers in Dentistry*. Chicago: Quintessence Publishing Co. Inc.; 1995. p. 17-25
3. Standard test method for adhesion-in-peel of elastomeric joint sealants. American Standard Test Measurement. Philadelphia. American Society for Test materials: 1992. p.98-101.
4. Anthony DH, Peyton FA: Dimensional accuracy of various denture base materials. *J Prosth Dent* 12:67
5. Kapur K, Shaklar, The effect of complete dentures on alveolar mucosa. *J Prosth* 13:1032.

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