

*Biocompatible complete dentures:
Practical dental technology at its finest*



Fig.1 Special record base with modified mandibular bite rim



Fig. 2 Denture teeth arranged in wax on completed denture base



Fig. 3 Vestibular view of the completely characterized denture



Fig. 4 Complete denture

Introduction: For complete dentures, the following materials are usually recommended: Supreme Clear, MP Super Clear.

All the recommended materials are characterized by molecular chains that are relatively long. This is important because smaller molecules are potentially more dangerous as they may penetrate the mucosa or even the skin. This is a fact that bears mentioning in the light of a scientific study conducted in Scandinavia. This study showed that of all the dental technicians specializing in resin restorations, 10% suffer from allergies to artificial resin.

The solubility in water of the recommended materials is less than 0.7 % on average, i.e. it is very low. Denture materials that are completely insoluble in water are a goal that cannot be achieved. Solubility in water is a measure of how many particles - of whatever type and kind - may be "washed out" from a resin material, particles that are subsequently prone to moving more deeply into the human body.

These are the reasons that have prompted me to use none but the recommended materials for fabricating complete dentures.

As far as the biocompatibility of the recommended materials is concerned, it bears noting that these materials do not result from a free-handed mixture of two components, one of which - in the case of PMMA resin - is a

monomer. Rather, all these materials are formulated to be ready for use. This means that mixing errors cannot occur. When a powder and a liquid are simply mixed, as is the case with methylmetacrylates, bioavailability can be additionally compromised by improper handling of the two components.

Production The dentist should receive completed denture bases on which the bite rims can be placed. On one hand, this gives the dentist a bite record base that fits very precisely. On the other hand, the dentist is able, even at this early stage, to evaluate the fit of the future denture base in the patient's mouth. There is a special kind of record base I would like to present here that I consider to be both very safe and very useful. By contrast with conventional record bases with their wax rims on the maxillary and in the mandibular base, the mandibular bite record base has been modified for this system. The completed record base is fitted with a bite rim that is wedge-shaped in cross-section, along the crest of the mandibular ridge, with the point of the wedge pointing upward toward the occlusal aspect. However, the bite rim does not end in a sharp edge, but shows a narrow flat area at the top. Grooves are placed in this flat area (Fig. 1). The advantage of these record bases is that the patient can close his or her jaws without any protrusive, retrusive, or laterotrusive movements, something that is not always assured with the traditional record bases with maxillary/mandibular bite rims. The latter present two larger areas that, once they meet while closing the jaws, will have to be compressed by the patient's using significant force. This also results in a more pronounced hazard of eccentric movements. With the bite record described here, the bite walls engage immediately (comparing the impact of high heels vs. flat heels on the ground will give you a good idea of the difference), and the bite rims are immediately fixated in the correct relative position.

Only transparent palatal plates should be used for complete dentures. Any irritation by coloring agents across large areas of mucosal contact should be avoided. For these large contact areas, the absence of dye oxides is an important consideration. Moreover, a transparent palatal plate has a positive psychological impact on the patient, something that should not be shrugged off. In addition, denture hygiene is potentially better when the palatal plate is transparent, since it is easier to check which areas have not been thoroughly cleaned - similar to a window pane.

Once the patient's bite has been registered, the denture teeth are arranged on the already existing denture base (Fig.2). This is done at the laboratory. On try-in, the dentist is able not only to check the positions of the denture teeth, but also the fit of the denture bases. If corrections should be required, these can be performed cleanly and delicately directly on the existing denture bases, using a special corrective resin material. This procedure gives complete denture try-ins a completely new dimension. According to ESCHLER, permanent alternating loads caused by even the slightest deformities of complete denture bases may result in erythemas and in edematous deposits of extracellular liquid in the palatal region. Adverse influences on the denture contact area of the oral mucosa are primarily a biomechanical problem. Now it is possible to inspect the denture base for good seating and a passive fit as early as during the first try-in visit. The denture tooth setup should follow closely the method described by GERBER.

Finally, a light pink resin layer is applied vestibularly, spanning the region between and including the second premolars (Fig. 3 + 4).

Summary Fabricating complete dentures from biocompatible materials should be an ethical requirement of both the dentist and the dental technician, given the fact that the incidence of allergies is constantly on the rise. NIQUIST found significant soft-tissue changes in 72% of the cases he examined; Wright found similar changes in 79% of his cases. Chemotoxic irritation may cause the familiar symptoms of "burning mucosa" and palatal erythemas. Gasser implicates the basic ingredient of methylmetacrylate in allergies, mucosal swellings, but also generalized allergic reactions such as eczema, conjunctivitis, or asthma.

Materials

Supreme Clear, MP Super Clear Not chemo plastic substances. They are thermoplastic substances that are shaped purely thermally in an injection molding machine at a certain temperature 245 °C. No chemical hardening and no polymerization occur, rendering the use of catalysts unnecessary.