10

Relining a Complete Denture

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Resorption of the residual ridge is inevitable and progressive.[1] Additionally, the denture base changes some over time due to distension and abrasion of the acrylic resin. The net result is a denture that becomes unstable and eventually loosens to the point where the denture wearer feels uncomfortable and inconvenienced. Because it is impossible to predict the rate of ridge resorption, there is no precise answer to the question, "When will it need relining" or "How long should the denture last?" Moreover, the response of denture wearers to a denture that is slowly loosening varies greatly. As a result, long periods of time can elapse between the initial placement of a denture and the patient's request for a reline. This delay can pose a particularly difficult decision for a dentist when a patient refuses to have a familiar denture replaced.

Reline, Rebase, or Remake?

The decision to reline, rebase, or remake a denture is made following an examination of the appearance and occlusion of the denture teeth. The patient is usually content with the appearance of the denture, although the teeth may seem discolored, or even excessively bleached. Older patients in particular are not keen to change the arrangement and appearance of their teeth, even if the teeth, from the dentist's perspective, look unnatural.[2–4]

The occlusal condition is central to the decision of replacing or rebasing the denture. In short, the denture can be retained if the occlusal anatomy of the posterior teeth is intact and occlusal intercuspation acceptable, or, at least, easily modifiable. This decision is tempered by awareness that flat occlusal surfaces on teeth may reflect the original occlusal design rather than excessive occlusal wear. Furthermore, the vertical dimension of occlusion (VDO) may look deficient (overclosed) because of residual ridge resorption. Therefore, the dentist must assess the possibility of reestablishing an acceptable VDO when the denture is relined or rebased.

Finally, the decision to reline or rebase the denture depends on the quality of the denture base supporting the teeth. Quite simply, a rebase is the ultimate reline, where all of the acrylic resin is removed and replaced with new resin to support the teeth. A rebase is generally performed more easily around porcelain teeth where there is only mechanical interlock rather than a chemical union between the teeth and the base.

Examination and Diagnosis

The interview and clinical examination reveals the patient's experience with the denture currently in use and with dentures in general. A history of long-standing comfort and satisfaction with the denture, but a recent sense of looseness or instability, may be the best indication for a reline. More specifically, the patient may complain that the denture base has become uncomfortable or painful when eating, or that food accumulates under the denture more readily now than before. Either way, on examination, the denture seems loose and unstable as explained in Chapter 1, although the occlusal anatomy looks acceptable, and the occlusal contacts are close when the denture occludes in centric relation.

The oral examination includes as usual a full extraoral and intraoral assessment of face, joints, lips, mucosa, tongue, glands, and underlying bone and muscles. The need for a radiographic examination—usually with a panoramic view—is subject to some discretion and depends largely on the current clinical findings moderated by the length of time since radiographs of the jaws were made.[5] Most definitely, any atypical clinical observation warrants careful exploration before the denture is relined, rebased, or remade. Indeed, many soft tissue abnormalities, most notably denture-induced hyperplasia, require a protracted series of adjustments with soft lining materials.[6–9] In addition, any obvious occlusal irregularities should be removed before the denture is relined, preferably by mounting the denture on an articulator as described in Chapter 9.

Methods of Relining

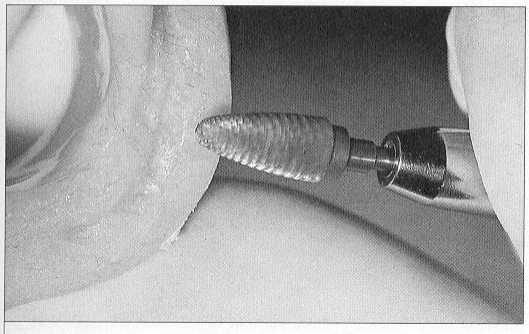
Hard Liners

Indirect Technique The classic procedure for relining a complete denture involves modification of the alveolar surface of the base with a heat-process poly(methyl methacrylate) identical to the original material used for the denture base. In essence, the denture is used to contain an impression of the denture-bearing area much as the acrylic tray was used to construct the original master cast of the denture-bearing area. However, when a denture is relined, the occlusal relationship between the denture and the opposing dentition must not be disturbed. Consequently, to this end, the dentist makes the impression on the denture base while prompting the patient to occlude lightly in centric relation as the impression polymerizes.

The denture is modified slightly to prepare for the impression by:

1. Evaluating the base to ensure that it is extended to the functional limit of the surrounding muscles (see Chapter 1 for a similar evaluation of the acrylic impression tray).
2. Eliminating all ridges and undercuts on the alveolar surface of the base relative to the path of insertion onto the ridge (**Figs 10-1a to 10-1c**).
3. Applying impression compound selectively, if necessary, to extend the periphery of the base and to enhance the peripheral seal (**Figs 10-2a and 10-2b**).

There are two clinical approaches to making the impression for the master cast. The static approach is used most frequently with a polyvinyl siloxane material in a manner similar to the impression technique for the original master cast. Alternatively, the functional approach is used with a resilient material that is molded by the action of the surrounding muscles in the mouth.



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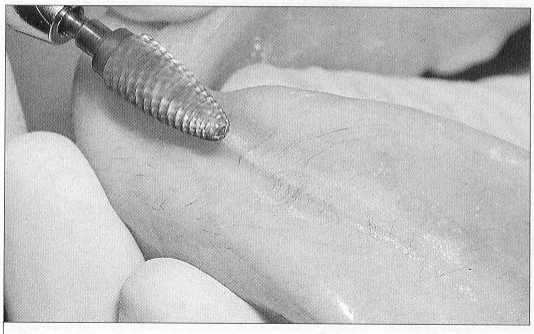

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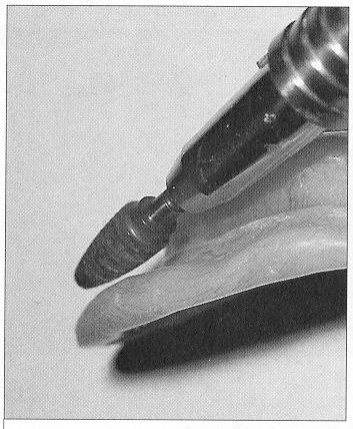

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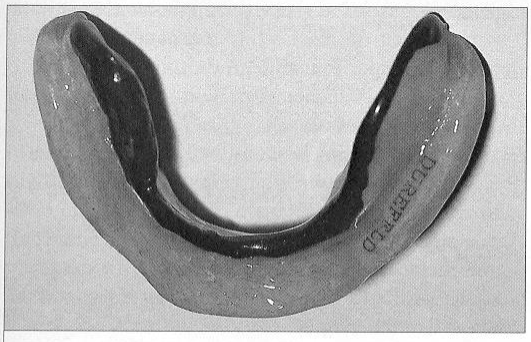

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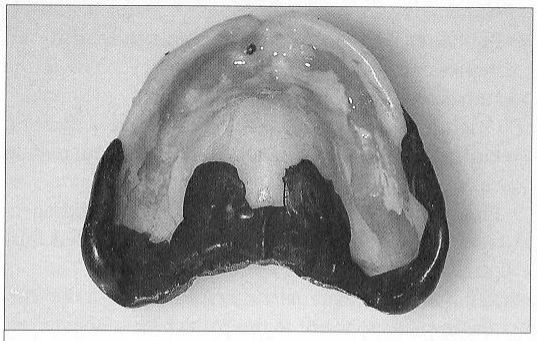

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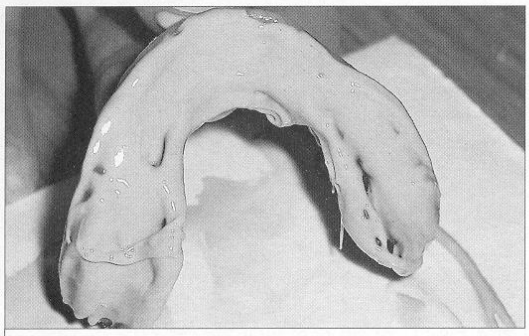

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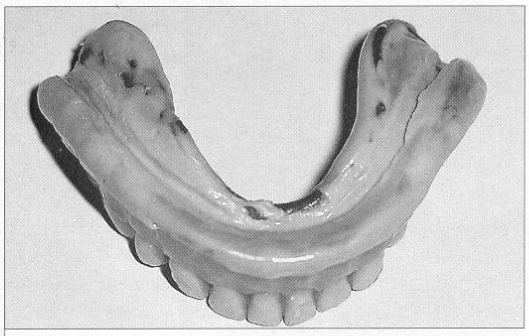

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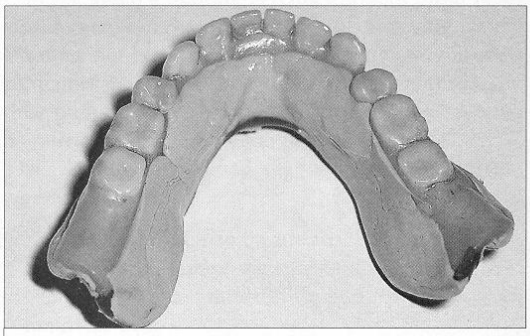
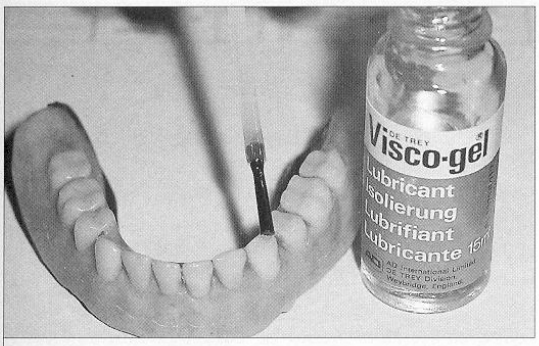


10-4c

The static impression is made by:

1. Painting a silicone adhesive and spreading an impression material of low viscosity evenly over the surface on the denture base (**Fig 10-3**).
2. Orienting the denture directly over the ridge and bringing it slowly to position onto the mucosa to ensure that it is aligned appropriately.
3. Prompting and assisting the patient to occlude gently on the denture with the mandible retruded fully (**see Figs 9-7 and 9-15**).
4. Removing the material from the throat with a cotton-tipped applicator if the patient feels uncomfortable or distressed.
5. Alternating between a manipulation of the patient's paraoral muscles to shape the impression around the periphery of the base while the patient repeatedly licks the upper lip, and prompting the patient to occlude gently in centric relation as the material sets.
6. When the denture is removed from the mouth, examining the impression (**Figs 10-4a and 10-4b**) to ensure that it is accurate, that there are no obvious signs of distortion of the supporting mucosa, and that it has recorded the mucosa at the periphery of the vestibule, especially on the lingual side of the lower denture (**Fig 10-4c**).



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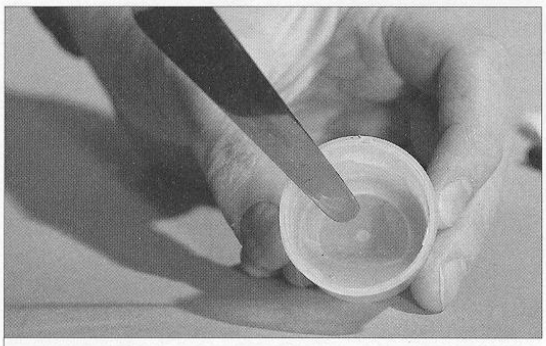

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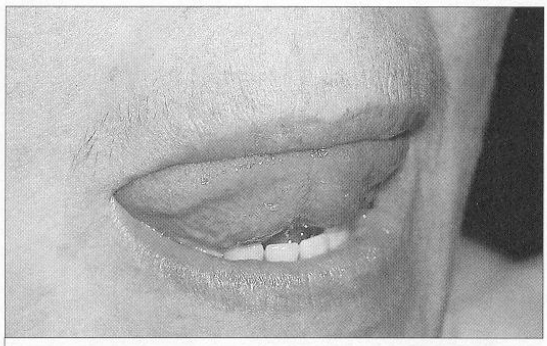


10-6b

7. Finally, the denture is disinfected in a 2% glutaraldehyde solution for 10 minutes before it is sent to the laboratory.

If both maxillary and mandibular dentures are being relined, the impressions are made separately, but, where possible, the maxillary impression is made first to maintain the esthetic alignment of the teeth.

The functional impression is made by:

1. Coating the occlusal surface of the denture with a lubricant
2. Mixing the powder and liquid of the impression material according to the manufacturer's instructions (ViscoGel, Dentsply DeTrey), and allowing it to polymerize in the mixing cup for about 3 minutes until it reaches the doughy state of polymerization when it can be handled more easily (**Figs 10-5a and 10-5b**).
3. Applying the doughy material to the alveolar surface of the denture base.
4. Placing the denture in the patient's mouth and manipulating the flow of the material around the periphery of the denture.
5. Asking the patient to swallow, lick the upper lip, and move the cheeks, lips, and other muscles through a normal range of movements (**Figs 10-6a and 10-6b**) for at least 15 minutes until the impression reaches a more stable rubber-like state.

10-7a

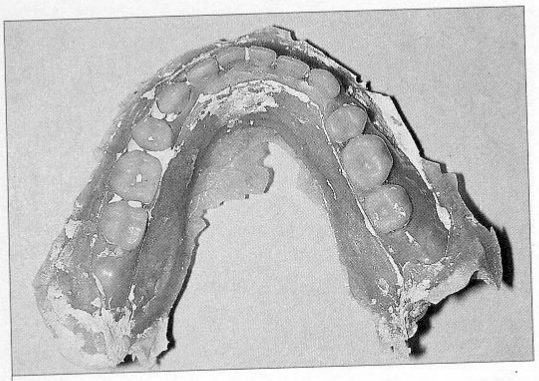
10-7b

10-7c

6. As the impression progresses from the doughy to the rubbery state, it can be removed occasionally from the mouth to redirect and remove excess if necessary.
7. When the impression is finally removed from the mouth, it should have a smooth surface that clearly accommodates the shape of the supporting tissues and the surrounding muscles (**Figs 10-7a to 10-7c**).
8. Again, the denture is disinfected in a 2% glutaraldehyde solution for 10 minutes before it is removed from the clinical area.

The impression should be poured in stone immediately if it was in the mouth for a short period. Alternatively, the denture can be worn for several weeks with this impression in place. This prolonged use has led to the view that the material acts as a "tissue conditioner" by modifying the structure and stability of the denture to encourage the recovery of distorted denture-supporting tissues.[10] When both maxillary and mandibular dentures are being relined, the impressions are made separately with the maxillary impression usually preceding the mandibular one.

The process of replacing the impression material with acrylic resin is the same for either the static or the functional approach. The dentist instructs the dental technician by prescription to reline the denture with a heat-cured resin, processed preferably at 69°C for 9 hours. The patient may not agree to part with the denture for more than a few hours, so the technician can use a fast-setting autopolymerizing resin, but there is an increased risk of producing an unacceptably porous surface. In either situation, a master cast is made around the impression on the denture base (**Fig 10-8**) as the original master cast was made (see Figs 3-24 and 3-25). This cast provides the surface against which the denture is relined by embedding it in a processing flask, warming the flask to soften the impression compound before opening it to remove the impression material, sealing the surface of the cast, and packing the mold with autopolymerizing acrylic resin to process as discussed above (**Figs 10-9a to 10-9e**). When the acrylic is processed, the flask is cooled slowly and the denture retrieved from the stone mold. The denture is removed from the cast, acrylic flash is removed, the nonalveolar



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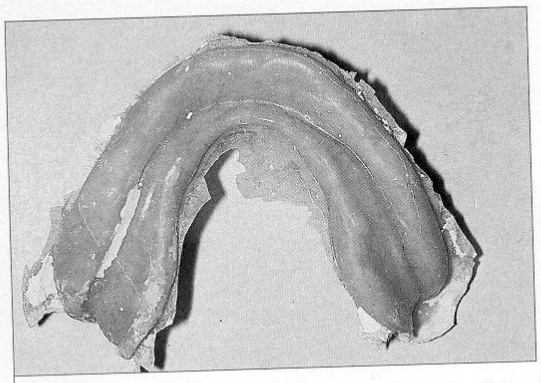

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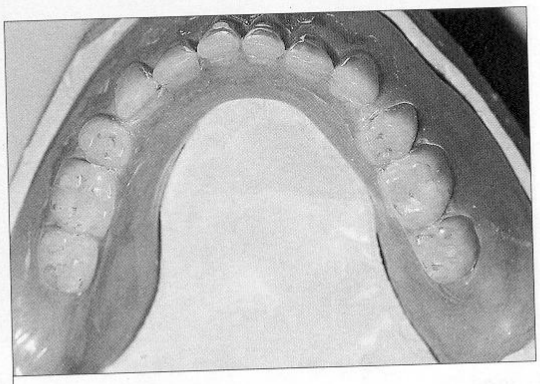


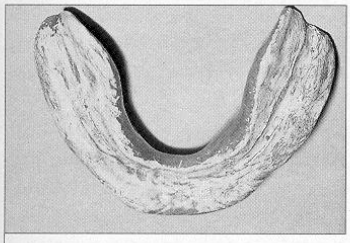
10-10c

surface polished, and the denture returned to the dentist on a cast (**Figs 10-10a to 10-10c**). Subsequently, the denture is placed on the residual ridge, and the base is adjusted for comfort using pressure indicating paste. If necessary, the occlusal contacts are equilibrated by remounting the denture on an articulator before the denture is delivered back to the patient (**Figs 10-11a to 10-11g**) with instruction for ongoing maintenance.

Direct Technique Chemically cured acrylic resins are available for relining dentures directly in the mouth. Materials available for this process vary considerably in both the chemical reactions as the resins harden in the mouth and in the final structure of the relined surface.[11–13] They have an unpleasant odor and the monomer that leaches out of the material for the first few days may irritate the mucosa.[14,15] The heat produced by the chemical reaction of some materials can burn the alveolar mucosa unless the newly relined denture is repeatedly removed from the mouth, cooled in water, and returned to the mouth as the material adapst to the shape of the supporting tissues.[11] Moreover, the chemically cured surface is more porous than the surface produced by a heat-cured resin. Consequently, it may discolor more rapidly than the original heat-processed resin in the remainder of the denture. Nonetheless, with appropriate concern for these limitations, chemically cured acrylic resins are useful as a means of stabilizing a denture quickly and at minimal cost.

Resilient Liners

Resilient or soft liners are made from from silicones or polyethylmethacrylate and other acrylic copolymers compounded with plasticizers. In general, the plasticized acrylics (ViscoGel, Dentsply DeTrey; Coe Soft, GC America) are used as temporary or short-term liners, also known as tissue conditioners, whereas the silicones (Molloplast-B, Regneri and Co; LUCI-SOF, Dentsply Trubyte) are more durable and suitable for long-term use. However, for patients with extreme ridge resorption, the base, more than anything else, must be ade-



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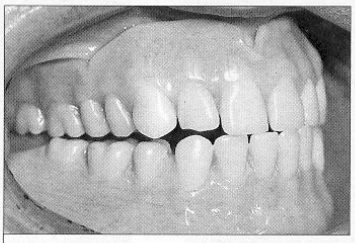

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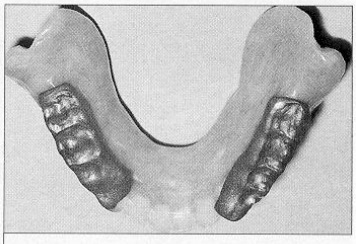

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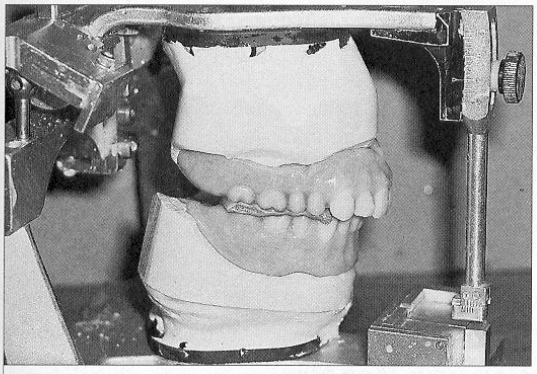

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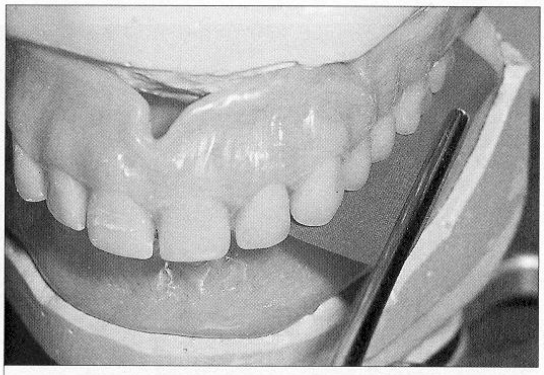

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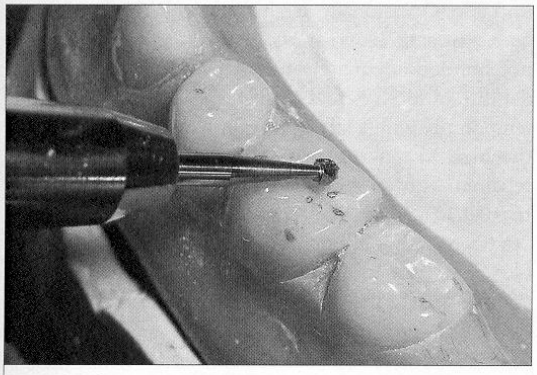

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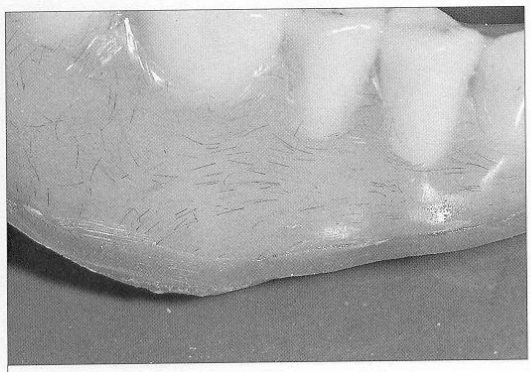


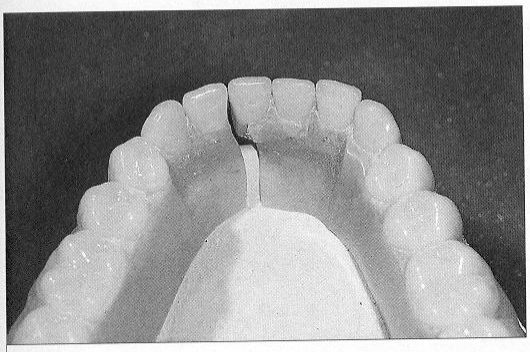
10-12c

quately extended to distribute the stress over as much denture-bearing support as possible. Furthermore, the denture teeth must be arranged on the denture to occlude evenly with the opposing dentition and to transmit the occlusal forces onto the ridge where the muscles can help to buffer the stress. The resilient denture base should not be used to compensate for inadequacies in either the base or the tooth arrangement.

Materials currently available will not bond securely to bases that have been used in the mouth, so they are added to the hard processed base when the denture is newly made or as part of a relining with new acrylic resin. A coarse abrasive wheel ("Red Acrylic" Wheels, No. 5111, Dedeco) is required to adjust the material, which is about 3 mm thick, covering the entire alveolar surface of the base (**Figs 10-12a to 10-12c**). Its useful life expectancy of resilient liners varies greatly depending on the biochemistry of the mouth, although 3 or 4 years is a reasonable expectation.[16] Unfortunately, the response to the resilient liner is not always favorable as some patients continue to experience severe discomfort from a denture despite a soft lining material.

Denture Repairs

Fractures occur on dentures most frequently when the residual ridge resorbs to the point where the denture is unstable. Occasionally, teeth are knocked off a denture by a traumatic blow, or because the denture tooth was not bonded adequately to the base. In any case, the denture or tooth is reassembled by hand, held together temporarily with a sticky wax until stone is poured into the base to make a cast so that the fracture can be repaired with an autopolymerizing resin (**Figs 10-13a to 10-13d**). When the repair is complete, the cause of the fracture should be explored and eliminated if possible. Most frequently, the denture needs a new liner to compensate for the resorption of the residual ridge.



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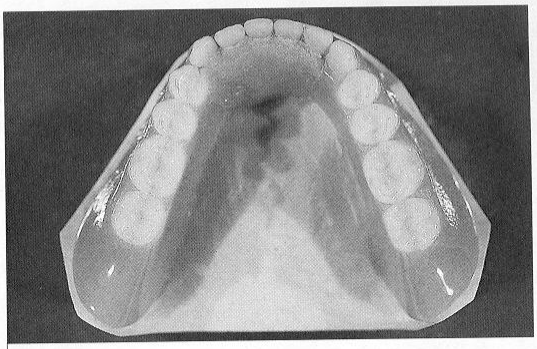

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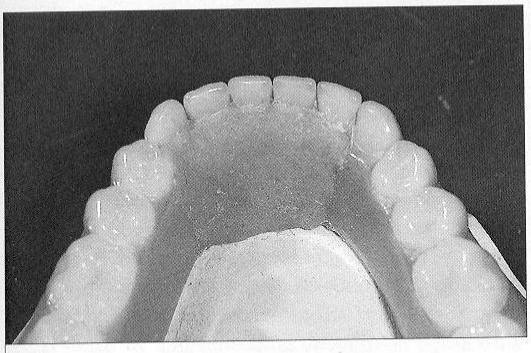

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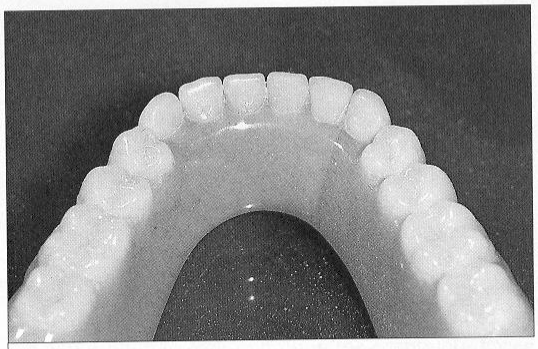

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