Lec:14 Prosthodontic

Repairs of fractured partial dentures

Deciding to repair or remake an existing RPD is sometimes difficult. Consider before proceeding to treatment:

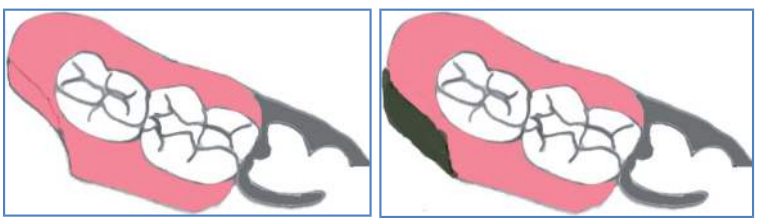
- The patient's financial status.
- The patient's physiological age.
- The frequency of appointments, which represents production time.
- The patient's medical status.
- The degree of difficulty of the impression - making procedures.
- The associated dental laboratory fees.

Some or all of these factors may influence the decision whether to repair or remake the prosthesis. Frequently, it is more expedient to remake an RPD than to devote the time, effort, and dental laboratory fees necessary to repair a framework that is marginally acceptable and may require replacement in the near future.
Simple repairs or additions to an RPD can usually be accomplished with or without impressions. Many times, simple repairs can be accomplished in the dental office without outside dental laboratory support or expense.

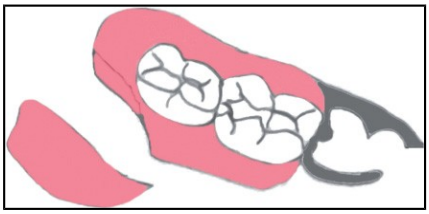
Denture base repair

Various types of RPD base breakage may occur, ranging from the complete loss of a denture base border segment to the fracture or loss of a portion of the denture base proper. In the former example, complete loss of a segment of the denture base border will require a rebasing or relining impression procedure.

1. When an entire portion of the denture base is missing, the denture base must be corrected with autopolymerizing acrylic resin, stick compound, or both so that the impression material can be accurately carried into place. A reline impression using an elastomeric impression material is made; the RPD acts as a tray.



2. The completed impression is boxed and poured with dental stone to secure a master cast.
3. The new denture flange segment is repaired with either autopolymerizing or heat - cured acrylic resin. Heat - cured acrylic resin repairs are best accomplished by a dental laboratory service.
4. When the fractured segment of the RPD denture base is still available, the repair is a relatively simple in - office procedure. The fractured pieces are approximated and joined with sticky wax.



The tissue surface of the RPD is poured with dental stone. When the master cast is sufficiently hard, the RPD is removed and the junction of the segments is enlarged to approximately 2 – 3 mm in width. A separating medium is applied to the working cast, and the RPD segments are replaced on the stone cast; the space of 2 – 3 mm created between the segments is for the repair acrylic resin.

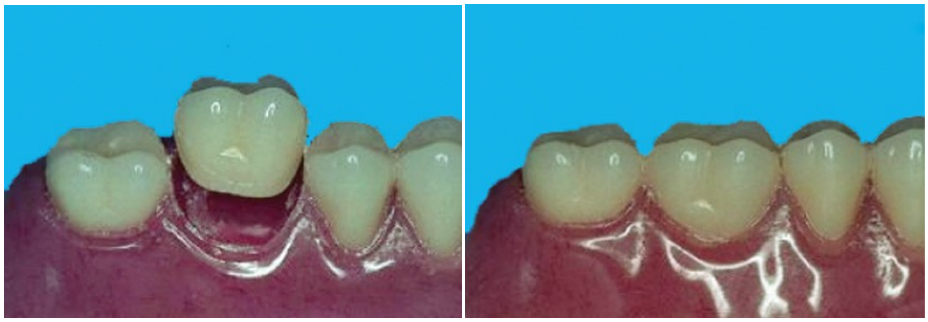
Autopolymerizing acrylic resin is added in a“salt and pepper” fashion (sprinkled on) to the space between the approximating segments. The acrylic resin monomer and polymer should be applied alternately until the repair site is slightly overfilled. For a denser repair with less internal porosity, the RPD still on the dental stone cast should be placed in a temperature – controlled For a denser repair with less internal porosity, the RPD still on the dental stone cast should be placed in a temperature – controlled pressure bath at 30 p.s.i. at about 120 ° F for30 minutes.

The repair site is trimmed and finished with acrylic burs mounted in a low - speed handpiece. Polishing is carried out in a manner, using the various grades of conventional pumice and finally acrylic resin polish.

Repair of fractured denture teeth

There are two basic types of denture teeth used in RPD treatment: dental porcelain and acrylic resin.
The procedure for repair and replacement of acrylic resin denture teeth is as follows:

1. If an acrylic resin denture tooth is dislodged from a new RPD, the common cause is an incomplete chemical bond between the acrylic resin denture tooth and the acrylic resin denture base. This incomplete chemical bond may be caused by wax residue or oils left between the two acrylic resins when the RPD was processed.
2. Therefore, the denture tooth can normally be reseated in the denture base and autopolymerizing acrylic resin may be used to repair the RPD. Processing, finishing, and polishing are the same as described for the repair of the denture base.



3. When the acrylic resin denture tooth is abraded or fractured, a similar series of steps may be accomplished. The fractured or abraded tooth must be carefully cut out to create space in the denture base for a similarly sized new denture tooth. This should be accomplished at slow speed with an acrylic bur.
4. A new denture tooth is selected, adjusted to fit the repair site, and checked to ensure that there is adequate room for the autopolymerizing acrylic resin.
Occasionally the anterior denture teeth are positioned against the residual ridge to eliminate a denture flange. In these instances, when an anterior denture tooth is fractured, an impression must be made with the RPD in place and the repair must be carried out to completion on a dental stone cast.
When denture teeth are repaired on an RPD, the occlusion of the RPD in centric and eccentric positions must be carefully checked and adjusted as necessary.

Complex repairs

There are many complex repairs or modifications that can be made to a defective RPD. These include

(1) Repair or replacement of a clasp assembly or any part thereof,
(2) Repair of a major or minor connector, and
(3) Repair of the RPD after the loss of an abutment tooth.

All complex repairs require the use of proper impression procedures by the dentist. The most frequent type of component breakage on an RPD is the fracture of one or more parts of the clasp assembly (i.e., fracture of one or more clasp arms, the occlusal rest, or the area between the minor connector and the major connector). The cause of the fracture should be determined and corrected. If the design of the RPD was inadequate and stress on the RPD framework or parts of it was too great, then a new design and RPD are indicated.

More commonly the fracture of the framework is caused by
a patient or dentist mishandling the chromium- cobalt alloy (such as dropping the prosthesis, bending it on a dental lathe, or adjusting the clasp arm beyond the elastic limit of the metal).

A clasp arm is the RPD component that is most subject to fracture, and it can be repaired by either of two techniques:

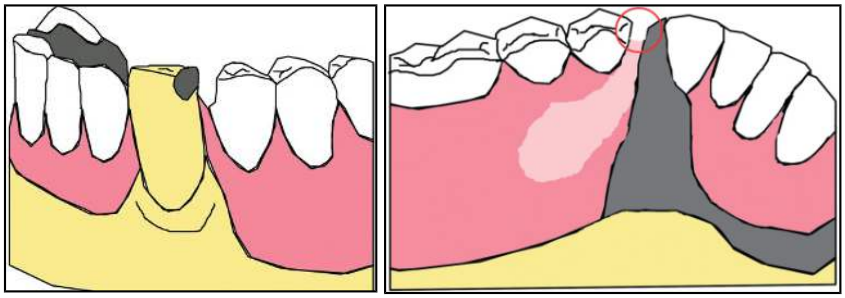
(1) By embedding an18 - gauge wire into the denture base of the RPD as a substitute clasp arm.
(2) By constructing a new clasp assembly and soldering or welding it to the existing RPD framework**.** The procedure for repair of a broken clasp arm using a wire is presented as a repair that may be accomplished in the dental office on a selected basis.

1. The buccal retentive clasp of an RPD is usually the most commonly fractured or deformed framework component. An 18 gauge platinum - gold - palladium (PGP) or wrought wire can be used as an effective substitute to replace this retentive arm on the RPD.
2. The fractured RPD is placed in the patient's mouth and the position and fit are verified. An irreversible hydrocolloid (alginate) impression of both the RPD and the natural teeth is made in a stock tray. Ensure the RPD has not been dislodged from the natural teeth or pulled loose from the alginate impression**.**

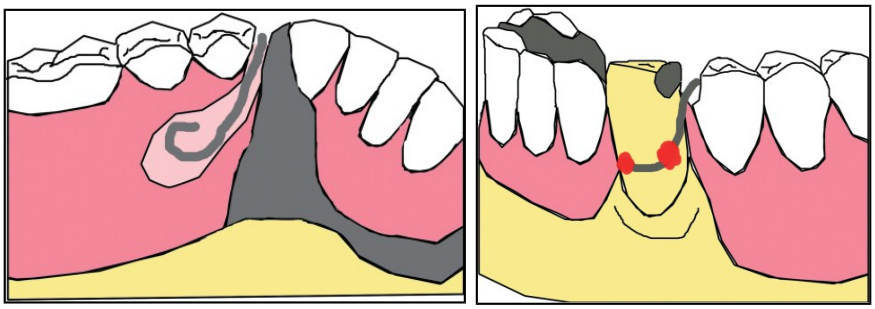


3. This impression is poured immediately with dental stone to create a working cast on which the repair will be completed.

4. The fractured portion of the clasp arm is removed from the RPD framework. An area is created in the acrylic resin denture base.

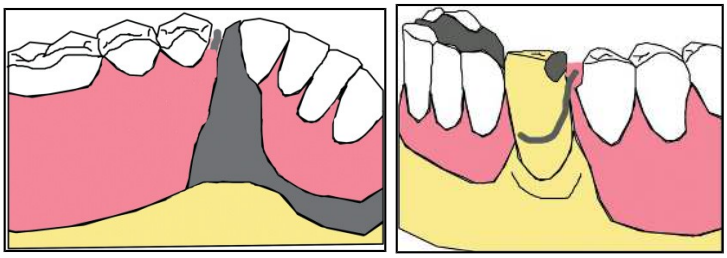


The 18 - gauge PGP or wrought wire is contoured to fit the contours of the dental stone replica of the abutment tooth, using orthodontic pliers. A retention loop is fashioned in the distal end of the wire so that it can be mechanically bound into the acrylic resin denture base.
The completed 18 - gauge PGP or wrought wire is secured in place with sticky wax on the dental stone abutment tooth**.**

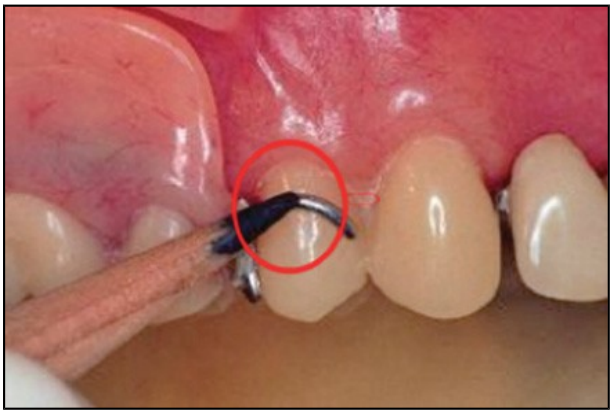


Autopolymerizing acrylic resin can be added in “salt and pepper” fashion to complete the mechanical retention of the wire in the denture base.
The RPD, 18 - gauge PGP or wrought wire, and autopolymerizing acrylic resin are cured in a temperature - and pressure – controlled curing unit in warm water (about 120 ° F) for 30 minutes at 30 p.s.i.

The RPD is now ready for careful removal from the repair cast.



The new buccal retentive arm and acrylic resin are finished and polished. The RPD is checked intraorally for proper contact of the 18 - gauge PGP or wrought wire arm into the retentive undercut. Adjustments are made when necessary to the wire to increase or decrease the frictional retention of the arm.



Additional repair methods for replacing a lingual reciprocal arm, broken occlusal rests, and replacing teeth that are extracted are possible. Even fractured major connectors may be repaired. Additionally, fractured abutment teeth or other teeth in contact and in support of the RPD can be restored under an existing RPD.
However, each of these procedures is complex and often time - consuming. One should carefully consider the value of attempting such repairs and modifications. It is important to understand and evaluate the conditions that led to the need for the repair. It is often more prudent to correct the conditions and remake the RPD than to repair a prosthesis of marginal use and function. It is beyond the scope of this discussion to elaborate on these procedures. However, there are many excellent publications that describe these advanced clinical and laboratory procedures in depth.