

Clinical and Laboratory Procedures for Freeway Splint Construction

All splints should be constructed within the freeway space

Maxillary Freeway Splint

The maxillary freeway splint is intended to disengage the teeth in order to relieve distal displacement of dental origin. The essential points in construction are:

- An impression is made of the maxillary dental arch. If opening is restricted, a gutta percha splint adapted to the buccal teeth on the side of the pain will usually allow opening for an impression within a few hours.
- Two stone casts are poured, one for a permanent record and one as a working cast.
- Rapid-setting cold-cure acrylic technique used to fabricate a base splint covering the palate and lingual surfaces of the teeth.
- The base splint is checked in the mouth to be sure that there is no occlusal contact at the desired mandibular position, which should be within the freeway space. Rehearse this position with the patient.
- Cover any composite restorations with foil or petroleum jelly, and fill undercuts with soft wax.
- Adapt two thin rolls of freshly-mixed acrylic to the lateral margins of the base splint. Warn the patient that it will taste terrible.
- Seat the splint firmly against the hard palate, and adapt the putty-like acrylic of the occlusal surfaces of the upper buccal teeth.
- Direct the mandible into the previously-determined non-clicking occlusal position. Usually the incisors will be in contact, with the midlines centered. The mandible may be about $\frac{1}{2}$ mm anterior to the occlusal position.
- As heat generation begins, the acrylic will be firm enough to remove the splint from the mouth. It should not remain in the mouth during the high-heat final setting phase, and the patient must not be left alone before it is removed.
- Finish the splint with light trimming and polishing. It will be thin, and may even be penetrated by some tooth cusps.
- As the splint is placed, instruct the patient that it may be necessary to feel for the new position. If the new position is correct, the patient will soon close directly into that position.
- Correctness of the splint will be verified by muscle comfort and freedom from joint clicking and crepitus.
- Posterior occlusal coverage may be reduced at the next appointment. Eventually, only the last molars need be covered to relieve the displacement.
- If restorative dentistry is indicated, it can be instituted after functional balance is restored.

Mandibular Freeway Splint

A lower splint is especially useful if there is a need to place a splint the day of the first examination. It is placed on the side of pain, the splint is made directly with rapid-setting acrylic.

- Fill in undercuts and deep interproximal areas with soft wax. Petroleum jelly should be applied to any restorations that might fuse to acrylic.
- Determine the occlusal position to be tested and established with the splint. This should be a non-clicking, centered mandibular position with incisors in contact.

For example, if the left joint is painful the lower midline will probably be deviated to the left. Center the midline, and the left condyle will be moved slightly forward to a more normal relation with the articular eminence.

If the incisors are not touching, the splint will be too thick.

- Make an adequate mix of acrylic and when it is putty-like, adapt it gently over the buccal teeth on the side of pain. As it begins to become firm, move the mandible to the predetermined position. As it becomes more firm, remove the splint and trim the interproximal projections with scissors. Replace and press the acrylic to the teeth, recheck the mandibular position, and briefly hold the buccal portion firmly against the teeth.
- Remove the splint before the temperature becomes excessive, and finish it by removing sharp interdental projections and general recontouring.
- If the splint snaps into place in the desired occlusal position, it is com-

plete. If it fits too loosely, it can be relined with thin acrylic. If the occlusal position is wrong, reduce the occlusal portion, add a new mix of acrylic, and establish the desired occlusal position. It should not be removed before heat generation is noticeable. Refinish and recheck.

Freeway Bite Plane

In a young orthodontic patient, an anterior bite plane is usually preferable to a posterior occlusal freeway splint. This permits freedom of the teeth for movement vertically and horizontally.

- Fabricate an anterior bite plane without a labial wire.
- Reduce the bite plane height so that the posterior teeth are barely free of occlusal contact. *The bite plane must be kept within the freeway space.*
- Determine the non-clicking mandibular position, which will probably be centered and slightly forward.
- Add a thin coating of rapid-setting acrylic to the bite plane surface.
- Seat it in the mouth and direct the mandible to the predetermined non-clicking position.
- Remove and finish with some indentations to guide the mandibular incisors on the bite plane surface.

Note that the joint is moved directly into a non-clicking position not dependent on the teeth or muscles.

Vertical and horizontal tooth movement can be planned from the bite plane position.

Complete Artificial Denture Freeway Splint

Such a splint is indicated only with a wide freeway space (6–10mm) involving posterior displacement of the mandibular condyles.

- Lubricate the lower buccal artificial teeth so that the acrylic will adhere only to the denture base. This permits removal of the splint without altering the original occlusion if desired.
- Place two rolls of putty-like acrylic over the lower buccal teeth and denture base.
- Insert denture and seat firmly. Continue holding the denture base in place and direct the mandible to a centered and slightly forward occlusal position. This is not a precise position, but rather an acceptable mandibular relation based on clinical judgment. In this instance there may be a 3 or 4mm space between the incisors, as when an abnormal 8mm freeway space is reduced to 3mm. The patient response is the final determinant of success.
- Finish and place the new denture splint in position. There should be no joint clicking, and the patient should feel more comfortable. Some will say, "My lower teeth fit better," with the even occlusal contact.

Partial Denture Freeway Splint

The most common indications are clicking or pain of either or both temporomandibular joints. If both joints are involved, the midlines will be aligned, and the mandible will need to be moved directly forward about 1mm with teeth in contact. In unilateral cases, the midline will be displaced toward the side of clicking or pain, requiring recentring to move the displaced condyle forward.

- First, equilibrate any occlusal interferences in the protrusive movement. The mandible will be felt to bounce over these interferences.
- Determine the position to be tested with the freeway splint.
- Wax undercuts and lubricate restorations.
- Adapt the putty-like rapid-setting acrylic to the partial denture and complete the same as a splint for natural teeth, avoiding occlusal contact on denture flanges or last molar artificial teeth.

Emergency Pain Splint

This is for temporary relief when the patient presents with severe pain and restriction of opening. The key is to place something between the teeth on the side of joint pain.

- Snap three strands of dental floss between two contacts of the lower buccal teeth on the side of pain.
- Adapt three thicknesses of base-plate gutta percha over the buccal teeth on the side of pain.
- Ligate the gutta percha splint into position with the dental floss. Separating wire may also be used.

This splint prevents the condyle from seating into the inflamed fossa. The pain subsides rapidly, and in the next day or two the mouth can be opened enough for diagnosis and impressions.

An alternative method of constructing the emergency splint is to adapt gutta percha over the buccal tooth crowns. This is removed, trimmed, and lined with soft denture liner material. After it is seated, wipe away the excess and do not remove it from the mouth. Such a splint will serve well for the day or two that is needed.