Immediate dentures

Introduction

Under normal circumstances providing a patient with immediate dentures is the most effective way of making the transition from the natural to the artificial dentition (Jonkman et al. 1997). It was once said that this method was the appropriate treatment for those in the professions who could not do without teeth for any length of time. The typical list would usually include vicars, doctors and business people – dentists were never mentioned! Times and outlooks have changed and today the preservation of appearance is an almost universal wish.

Definition

An immediate denture is “a complete denture or removable partial denture fabricated for placement immediately after the removal of natural teeth”

Advantages of immediate dentures

Related to the patient

(1) Maintenance of dental appearance and facial contour.

(2) Minimizing disturbances of mastication and speech.

(3) Facilitating adaptation to dentures. Difficulties with adaptation occur more commonly if the patient experiences an edentulous period of several months before dentures are fitted.

(4) Maintenance of the patient’s physical and mental well-being.

Related to the dentist

(1) Transfer of the jaw relationship. If the jaw relationship determined by the occlusion of the remaining natural teeth is acceptable in both horizontal and vertical planes, it can be transferred to the immediate dentures with reasonable accuracy. This obviates the need for the inspired guesswork of rest position estimation that is required if the patient is edentulous.
(2) **Achieving a good appearance.** The form and arrangement of the natural teeth can be reproduced in the immediate denture if the patient likes their appearance. When the appearance of the natural teeth is poor, or when their positions are likely to cause instability of the denture, planned improvements relative to the existing natural anterior tooth arrangement can be carried out.

(3) **Reduction in ridge resorption.** It has been suggested that the rate of ridge resorption following extractions is less if immediate dentures are worn than if no dentures are fitted. However, the evidence for this is inconclusive.

(4) **Haemostasis.** An immediate denture covers the sockets and thus encourages haemostasis. It also supports and protects the clot during the immediate post-extraction period, reducing the chance of its mechanical dislodgement, for example, by food particles.

**Disadvantages of immediate dentures**

It is extremely important for the dentist to fully explain to the patient the following limitations of immediate dentures (Seals et al. 1996). Treatment should not normally be started unless the patient fully appreciates and accepts these limitations. Failure to achieve such an understanding is a common cause of complaint by patients against dentists and can also result in failure of treatment.

(1) **Inability to complete a comprehensive trial stage.** As the trial stage is carried out while the remaining natural teeth are still present the try-in prosthesis consists of a partial denture restoring the existing edentulous spaces only. Therefore, artificial teeth that will eventually replace the natural teeth cannot be assessed. This is a particular disadvantage when anterior teeth are being replaced because neither the patient nor the dentist can make a full evaluation of the appearance of the dentures in situ.

(2) **Increased maintenance.** A number of visits are required after extraction of the teeth to allow for maintenance of the immediate dentures. Such maintenance may include:

- relining with soft or hard materials
- occlusal adjustment
- addition of a labial flange to an open-face denture.
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If the dentures are not properly maintained, extensive destruction of the denture bearing tissues usually results.

(3) Short service life. An immediate denture will not normally last as long as a conventional complete denture. After 6–12 months of the adjustments outlined above, together with morphological changes in the oral environment, an immediate denture will commonly need replacing. Therefore, patients are likely to have to face the financial and time commitments associated with the provision of a replacement denture sooner than they would normally expect.

In spite of the disadvantages listed above the advantages of immediate dentures are normally overwhelming. This form of treatment should therefore be offered to the vast majority of patients for whom the transition from natural to artificial dentition must be made. There are relatively few circumstances in which the immediate denture is contraindicated.

Types of immediate complete denture

There are basically two types of immediate complete denture:

(1) Flanged. This design can be subdivided into:

• Complete flange – labial flange fully extended to the depth of the sulcus.

• Partial flange – labial flange usually finished with the border extended about 1 mm beyond the maximum bulbosity of the ridge.

(2) Open-faced. There is no labial flange and the anterior teeth extend a few millimeters into the labial aspect of the sockets of their natural predecessors.

Comparison of flanged and open-face dentures

Appearance

(1) The appearance of a flanged denture does not alter after fitting whereas the appearance of an open-face denture, although good initially, can deteriorate rapidly as resorption creates a gap between the necks of the teeth and the ridge.
(2) The flange design allows considerable freedom in positioning the anterior teeth for optimum effect, whereas the anterior teeth on the open-face denture have to be positioned with their necks in the sockets of their natural predecessors.

**Stability**

A flange on an upper denture creates a more effective border seal, and therefore better retention, than is achieved with an open-face design. In the lower denture a border seal is not normally so significant. However, stability is of the greatest importance and this is improved by a labial flange because it helps to resist posterior displacement of the denture.

**Strength**

(1) The presence of a labial flange produces a stronger denture, which is less likely to fracture as a result of accidental impacts or high occlusal loads.

(2) A labial flange will also make the denture stiffer so that the likelihood of a midline fatigue fracture caused by repeated flexing across the midline is reduced.

**Maintenance**

(1) As the bone resorbs following extraction of the teeth, the immediate denture becomes loose and a reline is required. The presence of a labial flange makes it easier to add either a short-term soft lining material or a cold-curing polybutylmethacrylate relining material as a chair side procedure.

(2) As the color of some of the chair side reline materials is not always ideal they may be visible and unsightly when used with an open face denture, but discreetly concealed by a flange.

**Haemostasis**

(1) The flanged denture covers the clots completely and protects them more effectively than does an open-face denture.

(2) The flanged denture also exerts pressure on both lingual and labial gingivae, reducing the likelihood of post-extraction hemorrhage.
Remodeling of the ridge

There is always the danger that the patient will fail to attend for a maintenance appointment. The consequent wearing of an ill-fitting denture can, if it is open-faced, produce a scalloped ridge in the region of the socketed teeth (Fig. 3.8). This danger is avoided in the case of a flanged denture, which also has the advantage of distributing the functional loads more favorably to the underlying ridge, thus minimizing bone resorption.

Tolerance of replacement dentures

A significant clinical problem can be the difficulty that patients commonly experience in accepting a labial flange on a replacement denture when they have got used to an open face immediate denture. Although a correctly designed flange only replaces bone that has resorbed, its presence in the richly innervated oral cavity frequently promotes a complaint of ‘fullness’ of the upper lip. If a flanged denture has been worn from the very beginning, this problem does not occur.

For the reasons listed above the flange design is usually preferable; however, it is essential that the flange is kept thin and positioned correctly against the labial surface of the ridge, otherwise over-distension of the lip will result in poor facial appearance. In this context, selection of the correct path of insertion of the denture is essential. Where the ridge morphology produces a deeply undercut area, it may not be possible to fit a full labial flange unless there is surgical reduction of that undercut. Under such circumstances, a partial flange may be acceptable unless the patient has a smile line high enough to reveal the edge of the flange.

An outline of relevant clinical and technical procedures

The essential steps in the construction of immediate dentures follow the same sequence as those for conventional partial dentures until after the try-in stage. The subsequent conversion of the try-in to the complete denture requires modification of the cast in the laboratory.

Impressions for immediate dentures can be problematic if the remaining teeth are particularly mobile as a result of terminal periodontal disease. Under such circumstances a conventional alginate impression can even act as an instrument of extraction with some or all of the remaining teeth coming out in the impression. The risk of such an undesirable and potentially upsetting accident can be minimized by either:
(1) *Loosening the ‘grip’ of the impression on the loose teeth.* One way that this can be achieved if there are several teeth adjacent to each other is by moulding soft red utility wax into the sub-contact point spaces and around the necks of the teeth so that the alginate is prevented from locking into the undercuts. Solitary teeth can be protected by placing a loose-fitting copper band over them before taking the impression.

(2) *Temporarily strengthening the attachment of the vulnerable teeth.* A stronger attachment of the loose teeth can be produced by splinting them to adjacent teeth with composite.

**Cast modification:**

The nature of the modification depends upon whether the denture is to be flanged or open-face. The extent of the adjustment will be influenced by clinical assessment of the bone levels around the teeth to be extracted and on the amount of surgical reshaping of the ridge that is required. Therefore, as a general rule it is highly desirable for the cast to be modified by the dentist rather than by the dental technician.

**Flanged dentures**

   **A. Extraction without alveolar surgery**

If the arrangement of the natural anterior teeth is to be reproduced in the denture, a record of their position must be obtained in one of the following ways:

(1) Produce a labial index of the natural teeth before they are cut off the cast. The index can be produced quite simply by moulding silicone putty against the labial surface of the teeth and ridge on the cast. The artificial teeth are then set into the index while it is held against the cast.

(2) Remove teeth singly from the cast and immediately wax an artificial tooth into position so that the adjacent teeth serve as a guide to the position of the artificial replacement.

(3) Scribe guidelines on the cast recording the position, angulation and incisal level of the natural teeth.

Once the artificial teeth have been positioned, the flange is added in wax before the denture is processed.
B. Alveolotomy following interseptal alveolectomy

This procedure is intended to eliminate moderate labial alveolar undercuts so that a flanged denture can be used without that flange distorting the upper lip unduly. The denture is constructed on a working cast which is trimmed to the anticipated contour of the ridge after surgery as follows:

(1) The gingival margins are marked and the teeth removed.

(2) Guidelines are drawn on the cast.

(a) A line is drawn on the crest of the ridge, passing across the center of the sockets of the incisors and through the junction of the labial third and palatal two-thirds of the canine sockets.

(b) A second line is drawn horizontally along the labial aspect of the ridge; it is placed approximately two-thirds down the length of the shortest tooth root, usually the lateral incisor, and is continuous around all the teeth at that level.

(3) All that part of the cast contained within these two lines is trimmed away and the edges are rounded over.

(4) A clear acrylic template is processed on a duplicate of this cast and is used as a guide to control the amount of bone removal at operation.

The surgical procedure involves:

(1) Extraction of the teeth.

(2) Removal of the associated interseptal bone.

(3) Collapse of the labial cortical plate of bone and mucoperiostium, back into the resulting ‘gutter’.

(4) Insertion of the clear acrylic template to check if bone removal has been sufficient.

Blanching of the mucosa is clearly seen beneath the template in any area where there is excessive pressure.
(5) Further bone removal, if necessary, until re-insertion of the template ceases to cause blanching.

(6) Suturing of the sockets and insertion of the immediate denture.

C. Alveolectomy

The most common indication for an alveolectomy in association with the fitting of immediate dentures is the reduction of a prominent premaxilla to allow a more favourable placing of anterior teeth on the denture. A clear acrylic template is processed on a duplicate of the working cast trimmed to produce the desired ridge form. The template is used as a guide to bone removal during surgery in the same way as described for an alveolotomy following interseptal alveolectomy.

Open-face dentures

The purpose of socketing anterior teeth on an open-face denture is to maintain an acceptable appearance in the immediate post-extraction period by extending the labial aspect of the necks of the denture teeth into the sockets just enough to compensate for the gingival retraction that occurs immediately after extractions. Without socketing, an unsightly gap would soon appear between tooth and mucosa. The amount of gingival retraction will depend on the degree of pocketing and bone loss that is present around the natural teeth. These aspects should therefore be assessed before deciding whether the socketing should be to a depth of 2 mm, or whether a greater anticipated gingival collapse indicates that deeper socketing is required. When this decision has been taken, the teeth are cut off the cast and a recess of the required depth is cut in the labial aspects of the sockets. No recessing of the palatal aspects of the sockets is undertaken. The artificial teeth are carefully positioned in the sockets and the denture is processed.

Contraindications to immediate dentures

a) Patients at risk from a bacteraemia

Some clinicians believe that movement of an immediate denture can disturb the clots and surrounding tissues sufficiently to precipitate a bacteraemia. They are therefore opposed to the provision of immediate
dentures for patients who have a history of rheumatic fever with cardiac damage, or for those with heart valve or hip prostheses.

**b) Patients with a genuine history of post-extraction haemorrhage**

As multiple extractions of anterior teeth are generally required when immediate dentures are fitted, such treatment is inappropriate when there is a proven history of postextraction haemorrhage that has been difficult to control. A more cautious approach is indicated, involving the extraction of a few teeth at a time followed by suturing the sockets. Dentures are then fitted at a later date when the initial healing is complete.

**c) The presence of gross oral sepsis**

Although it is possible to provide immediate dentures for a neglected mouth it is generally unwise to do so. The anterior teeth are often unsightly because of surface deposits, caries, gingival inflammation or recession; therefore their retention for aesthetic reasons is unjustified. Furthermore, a patient who has neglected the mouth in this way is often unconcerned about appearance anyway. The benefits of an immediate denture are therefore reduced significantly.

**Clearance of teeth without immediate provision of dentures**

When a decision is taken to extract the remaining teeth before denture construction, it is common practice for a period of several months to be allowed for healing and initial alveolar modelling. This delay before taking impressions will produce more stable supporting areas for the dentures, although resorption will continue indefinitely but at a slower rate. The main advantage of this method, that the dentures retain their fit for a longer period, is outweighed by the following disadvantages:

- Loss of masticatory function and appearance during the healing period.
- The undesirable mental and physical effects on a patient that the absence of teeth creates.
- Tongue and cheeks may invade the future denture space, making adaptation to subsequent dentures more difficult.
- Difficulty in assessing vertical and horizontal jaw relationships when constructing new dentures.
• The difficulty in restoring appearance if all information on the natural dentition has been lost.

The last two disadvantages can be overcome by using a method whereby pre-extraction records can be kept and transferred to the subsequent dentures using the following procedure:

(1) **Clinic:**

• Take stock tray impressions.

• Record shade of teeth.

(2) **Laboratory:**

• Construct record rims to fill the edentulous spaces.

(3) **Clinic:**

• Record occlusion.

• Extract remaining teeth.

(4) **Laboratory:**

• Leave record blocks on the casts and add wax ‘flanges’ on the buccal side of the standing teeth.

• Obtain an impression of the whole assembly in a duplicating flask.

• Remove the assembly, cut the teeth off the cast and adapt a shellac base plate to what is now an edentulous cast.

• Replace cast and attached base plate in the duplicating flask.

• Cut channels in the surrounding impression material to allow molten wax to flow into the space previously occupied by the record rim and natural teeth to produce what will be the record block to be used once the patient’s ridges have healed sufficiently.

(5) **Clinic:**

• Record the jaw relationship with the pre-prepared rims, which will act as guides to the positions of the natural teeth before they were extracted.
• Take wash impressions in the record blocks.

(6) Subsequent treatment:

• Progress to the conventional trial and fit stages.

• If necessary, take additional wash impressions in the trial dentures if further rapid resorption has taken place.

This technique eliminates a good deal of the guesswork in assessing jaw relationships and tooth positions in the situation where immediate dentures are contraindicated.

It is surprising, in view of the disadvantages listed above, that the more efficient alternative method of making the transition from the natural to the artificial dentition via immediate dentures is not used routinely unless definite contraindications exist.
**Bibliography**


