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Immediate Denture

A Project Submitted to

The College of Dentistry, University of Baghdad, Department of Prosthodontics

in Partial Fulfillment for the Bachelor of Dental Prosthodontics

By

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بسم الله الرحمن الرحيم

صدق الله العظيم

Certification of the Supervisor

I certify that this project entitled **"Immediate denture"** was prepared by the fifth-year student **Lujain Zaid Hadi** under my supervision at the College of Dentistry/University of Baghdad in partial fulfilment of the graduation requirements for the Bachelor Degree in Dentistry.

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B.D.S., M.Sc.

Dedication

To the one who I literally can't describe with words…my dear and awesome Mother.

To my Father, brother and who bless my life with joy and happiness my brothers Ali & Hadi.

To my best friend who has always been by my side and who we spend the hard and good times together Mina Sadiq.

To my family, friends and the people I love…
Thank you all for being there for me.

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RPD	Removable partial denture
OVD	Occlusal vertical dimension

Introduction

An Immediate denture is a complete or partial removable prosthesis that is fitted immediately after extraction or modification of teeth. The prosthesis replaces the missing/modified teeth and where required, the adjacent hard and soft tissues. It is constructed prior to the extraction of teeth and is used immediately to provide function and aesthetics which are lost as a result of tooth removal and avoid the embarrassment patients may have with living without teeth, while waiting for the tissues to heal prior to definitive tooth replacement **(Allen, McKenna and Creugers, 2011)**.

Some clinicians take impressions on the day of the extractions and fit the dentures a few days later. These dentures are fraught with challenges as the alveolar ridge begins to resorb soon after. Therefore an immediate denture is only truly an immediate denture when fitted on the day of the extractions. As patients retain their natural dentition into older age **(Devlin, 2002)**, there is still a need for prosthodontic replacement as teeth are lost as a result of caries, periodontal disease, tooth wear or trauma **(McCord and Grant, 2000)**. The provision of an immediate denture can be challenging and close co-operation between patient, technician, and clinician is required **(Jogezai, Laverty and Walmsley, 2018)**.

Generally, there are two types of immediate dentures. The first is the conventional(classic) immediate denture in which the denture is intended to serve as a long-term prosthesis. Following the completion of the healing phase (usually a minimum or three to six months), the conventional immediate denture may be relined to maintain its basal adaptation to the supporting structures **(Rahn, Ivanhoe and Plummer, 2009)**.

The second type of immediate denture is the interim (transitional, "throw-away") immediate denture, which is designed to serve for a limited amount of

time, usually through the healing phase, after which it is replaced by a more definitive type of prosthesis **(Rahn, Ivanhoe and Plummer, 2009)**.

Aims of the Review

This review aims to:

1-Concentrate on the importance of the immediate dentures for the indicated patients.

2-Describe in detail the indications, contraindications, advantages and disadvantages of immediate dentures.

3-Explain the types of the immediate dentures based on the treatment plan and flange designs as well as their indications, advantages and disadvantages.

4- Discuss clinical and laboratory procedures for fabrication of immediate dentures, in addition to the instructions given to the patient and follow up care.

Chapter one

Review of literature

1.1. Immediate denture

The immediate denture is a dental prosthesis constructed to replace the lost dentition, associated structures of the maxillae and mandible and inserted immediately following removal of the remaining teeth **(GPT, 2017)**. Tooth loss leads to numerous consequences for the patient, such as problems with speech, poor chewing, and loss of facial aesthetics **(Allen, McKenna and Creugers, 2011)**. Besides the physical aspect, poor oral health can trigger emotional or behavioral changes in patients, damaging their self esteem and quality of life **(Little, 2012)**. An immediate denture can copy the characteristics of the existing dentition and establishes the vertical dimension of occlusion. It offers immediate replacement of the missing teeth, thereby avoiding a period of edentulism and social embarrassment. These treatments help relieve patient anxiety and bring about patient satisfaction **(Yeung et al., 2020).**

1.2. Indications for immediate denture (Nayak et al., 2020).

The immediate denture is indicated for:

A• Physical reasons:

1. Disuse atrophy of the bony base.

2. Unfavorable trabeculation of the repairing bone.

3. Damage of the temporomandibular joints.

B• Physiologic reasons:

1.Abnormal functioning of the mouth and mandible.

2. Impaired enunciation.

3. Abnormal deglutition.

C• Psychological reasons:

1. Humiliation.

2. adverse subjective reactions.

3. serving the indifferent patient.

1.3. Contraindications for immediate denture

An immediate denture is contraindicated for these conditions:

A. Patients with systemic conditions such as cardiac abnormalities, glandular disorders, blood dyscrasias and those with slow healing potential. Extreme deep overbites or other abnormalities that make balanced occlusion impossible **(Heartwell, 1992)**.

B. Patients with limited or poor mental capacity to understand instructions are poor maintenance risks.

C. Patients unwilling to cooperate such as indifferent or unappreciative patients.

D. Emotionally disturbed individuals.

E. Patients with acute periapical or periodontal pathosis.

F. Patients who have excessive bone loss **(Nayak et al., 2020)**.

1.4. Advantages of immediate denture

A• Natural teeth present during the process help in establishing the vertical dimension of occlusion.

B• The remaining natural teeth guide arrangement of artificial teeth.

C• Patient does not face the embarrassment of edentulous period and helping the patient at a time when losing a tooth or teeth may be a traumatic and difficult emotional process.

D• Patient regains function of speech and mastication faster.

E• It acts as a splint or bandage to control bleeding and protects the wound.

F• Maintaining the soft tissue contour of the face.

G• Patients are prepared to have the teeth removed when assured of replacement immediately **(HayesHall et al., 2007)**.

1.5. Disadvantages of immediate denture

A• There is no scope of anterior try-in.

B• It is expensive, because the immediate dentures will require frequent relining to meet the rapid changes in the tissues.

C• Potentially, it gives less retention because of arbitrary scrapping of the cast to fabricate the prosthesis.

D• Need to reline is frequent as the resorption of the bone and the shrinkage of the tissues are faster and greater.

E• Do not replace the stimulation provided by the natural teeth to the bone.

F• More postoperative care. The surgical site of an immediate denture will change throughout the healing period. This may require more adjustments or the placement of tissue conditioning material to increase retention and stability.

G• The procedures are precise and time consuming and requires more appointments **(Kraljeviê et al., 2001)**.

1.6. Classification of immediate denture based on the treatment plan

1.6.1. Conventional Immediate Denture

It is an immediate denture, which can be later modified to serve as the permanent prosthesis. It is usually done for patients undergoing total extraction. The treatment outline while preparing a conventional immediate denture consists of the extraction of the posterior teeth followed by the extraction of the anterior teeth. The ridges in the posterior region are allowed to heal before the extraction of the anterior teeth. The denture is inserted on the appointment of extraction of the anterior teeth **(Nallaswamy, 2003)**.

1.6.1.1. Indications for conventional immediate denture

A• For patients with periodontally weak teeth indicated for extraction.

B• For socially active people who are very self-conscious about their appearance.

C• Generally indicated when only anterior teeth are present or few posterior teeth remain that do not support an existing removable partial denture

D• Generally indicated when patient can function without posterior teeth for approximately 3 months

E• Indicated when two extraction visits are feasible **(George, 2019)**.

1.6.1.2. Advantages of conventional immediate denture

A• It gives a psychological benefit to the patient. The patient does not appear edentulous at any point of time.

B• Muscle tone, tongue size and vertical dimension are preserved.

C• Centric jaw relation is easy to record.

D• Less post-operative pain, because the extraction sockets are protected.

E• Postoperative hemorrhage and infection are also prevented due to the protective action. It acts like a splint for the tissues.

F• Tooth size, shape, shade selection and arrangement are easy.

G• It is easier for the patient to adapt to the permanent prosthesis **(Nallaswamy, 2003)**.

1.6.1.3. Disadvantages of immediate conventional denture

A• Requires more chair time.

B• More expensive.

C• Due to the different positions of the teeth centric relation and centric occlusion are difficult to record **(Lee, 2015)**.

D• Try-in procedure is not possible. Hence the dentist cannot have any idea about the outcome of the denture.

E• The patient might find speech and mastication difficult for a short period of time **(Seals, Kuebker and Stewart, 1996)**.

1.6.2. Interim Partial Denture

As shown in Fig 1.1, it is a provisional, temporary denture used for a short interval of time will provide esthetics, mastication, occlusal support and convenience. Sometimes this denture can be helpful in conditioning the patient to accept the final prosthesis. The patient may wear the interim RPD for a very short period or for a more extended period of years, depending on the situation **(Păuna et al., 2009)**.

Figure (1.1): An interim removable partial denture (Phoenix, Cagna and DeFreest, 2008).

1.6.2.1. Indications for interim partial denture

Interim partial denture are indicated for these conditions:

A• When age, health, or lack of time precludes more definitive treatment.

B• Interim removable partial dentures are often used in young patients who have lost one or more teeth as a result of trauma.

C• Construction of an interim removable partial denture can solve space maintenance problems while restoring adequate occlusal function .

D• Elderly patients whose health contraindicates the lengthy and physically trying appointments often associated with fixed partial denture construction.

E• Unexpected loss of teeth with less time available for definitive treatment **(Phoenix, Cagna and DeFreest, 2008)**.

1.6.2.2. Advantages of interim partial denture

Advantages of interim partial dentures include:

A• The shape and height of the ridge is preserved.

B• Psychologically beneficial to the patient.

C• It can be used as a temporary replacement when the permanent denture is being fabricated or undergoing any repair or rebasing.

D• The dentist will be able to get an idea of the vertical dimension and jaw relation of the patient.

E• For patients who show atrophic changes due to long-term edentulousness the interim denture helps to rehabilitate the temporomandibular joint and the oral musculature **(Nallaswamy, 2003)**.

1.7. Classification of immediate dentures based on flange design Fig.

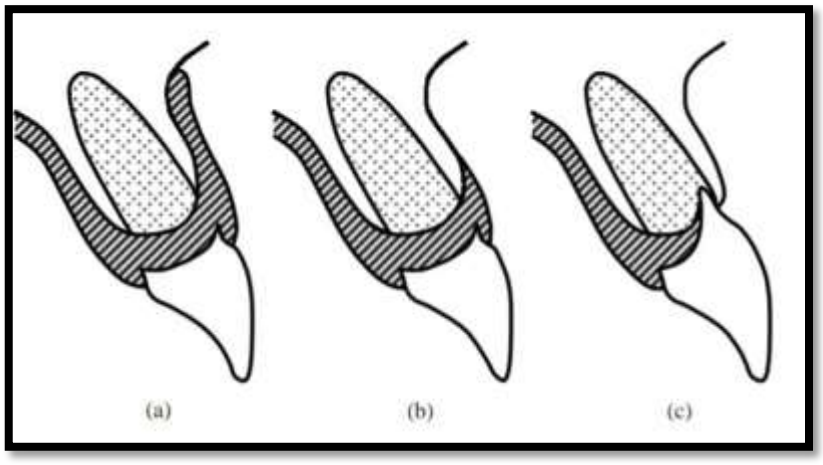

Figure (1.2): Types of immediate denture: a) Labial flange b) Partial flange c) Flangeless (Open faced) (Basker and Davenport, 2002).

1.7.1. Labial flange immediate denture

The labial flange fully extended to the depth of the sulcus **(Basker and Davenport, 2002)**. A labial flange may be used for the majority of patients when no large anterior bony undercuts are present, the lip line and lip activity are normal and if the teeth are periodontally involved and supporting bone is lost. A flange on an immediate denture is contraindicated when pronounced undercuts are present in the anterior labial region of the alveolar residual ridge and if the fullness of the lip would produce an unaesthetic result **(LaVere and Krol, 1973)**.

1.7.2. Partial flange immediate denture

The labial flange usually finished with the border extended about 1 mm beyond the maximum bulbosity of the ridge **(Basker and Davenport, 2002)**. The partial flange is indicated for immediate dentures when undercuts are present on the labial and buccal sections of the residual ridge and if it is desirable that the flange serve as a surgical splint . The partial flange is contraindicated for immediate dentures when the economic condition of the patient renders multiple corrective procedures impractical and if the patient has an unusually active lip line which would cause the denture flange to be unaesthetic due to exposure of its labial border **(LaVere and Krol, 1973)**.

1.7.3. Flangeless (Open-faced) immediate denture

There is no labial flange and the anterior teeth extend a few millimeters into the labial aspect of the sockets of their natural predecessors **(Basker and Davenport, 2002)**. The flangeless immediate dentures are indicated when deep undercuts are present on the anterior labial and buccal residual ridge, a high lip line and an active lip would expose an unaesthetic flange and if minimal amount of surgery is considered desirable. The Flangeless immediate dentures are contraindicated when periodontal disease exists with a substantial amount of bone loss which makes an

acceptable cosmetic effect difficult and if anterior fixed partial denture has been worn resulting in an uneven contour of the anterior residual ridge **(LaVere and Krol, 1973)**.

1.8. Comparison of flanged and open-face dentures

1.8.1. Appearance

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. Also, 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 **(Basker and Davenport, 2002)**.

1.8.2. 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 **(Basker and Davenport, 2002)**.

1.8.3. Strength

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. 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 **(Basker and Davenport, 2002)**.

1.8.4. Maintenance

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 chairside procedure. Also, as the colour of some of the chairside 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 **(Basker and Davenport, 2002)**.

1.8.5. Haemostasis

The flanged denture covers the clots completely and protects them more effectively than does an open-face denture. The flanged denture also exerts pressure on both lingual and labial gingivae, reducing the likelihood of post-extraction hemorrhage **(Basker and Davenport, 2002)**.

1.8.6. 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. 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 **(Basker and Davenport, 2002)**.

1.8.7. 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 **(Basker and Davenport, 2002)**.

1.9. Diagnosis and treatment planning

The patient's medical and dental history should be reviewed. The clinical examination of hard and soft tissues should be performed including an evaluation of the periodontal status of the remaining dentition. Also, a full mouth radiographic series (periapical and bite wing) is useful in evaluating the extent of bone loss due to periodontal disease, In addition to a panoramic radiograph that can be used to determine the presence of impacted teeth, retained roots, foreign bodies, exostoses, osteoporosis, cysts and other pathology. Mounted diagnostic casts are a valuable aid in the evaluation of tooth position, jaw relationships and occlusal plane discrepancies. Diagnostic casts also help to reveal and analyze undercuts **(DL, Hussain and Uthkarsh, 2007)**.

1.10. Some of the systemic conditions which can affect the basal seat

A• Uncontrolled diabetics

B• Cardiovascular and cerebrovascular diseases – these present a problem of poor clotting mechanism.

C• Mucosal disorders such as desquamative stomatitis

D• Keratosis, hyperkeratosis and dyskeratosis can result from deficiency of vitamins A and B.

E• Dermatological disease, such as psoriasis, pemphigus or erosive lichen planus.

F• Collagen disorders such as lupus erythematosus.

G• Osteoporosis resulting from bone matrix defect **(Prakash and Gupta, 2017)**.

1.11. Clinical procedures

1.11.1. Primary Impression making

A• Primary impression is made with irreversible hydrocolloid using a stock tray.

B• Impression is poured with stone to form a diagnostic cast.

C• Diagnostic casts are used to fabricate custom trays.

D• Custom trays are fabricated using auto polymerizing resin.

E• The remaining teeth are covered with two thickness of baseplate wax. The wax acts as a spacer.

F• Any undercut area is blocked with wax before custom tray fabrication **(Prakash and Gupta, 2017)**.

1.11.2. Final impression

There are two techniques of making final impression, which are as follows:

A• Single impression technique:

A single impression tray may be used when anterior and/ or posterior teeth remain **(Fig. 1.3, B)**. This technique is most useful when the teeth maintain positional stability and would not be displaced by the impression. On the contrary, if the soft tissue is compressible, the single tray approach may provide an opportunity to impress this tissue while at rest, using the remaining natural teeth to act as a tray stop when inserting the impression tray **(Zarb et al., 2013)**. The procedure is as follow:

A• A single custom tray is fabricated by covering the entire denture border area Fig. 1.3, A.

B• Border molding is done using green stick compound.

C• Custom tray is perforated to ensure flow of excess material and increase the retention of the material within the tray Fig. 1.3, C.

D• Tray adhesive is applied over the impression surface.

E• The final impression is made preferably with light bodied polysulphide rubber Fig. 1.3, D, as it records both the soft and hard tissues with accuracy and facilitates removal because of its elasticity **(Prakash and Gupta, 2017)**.

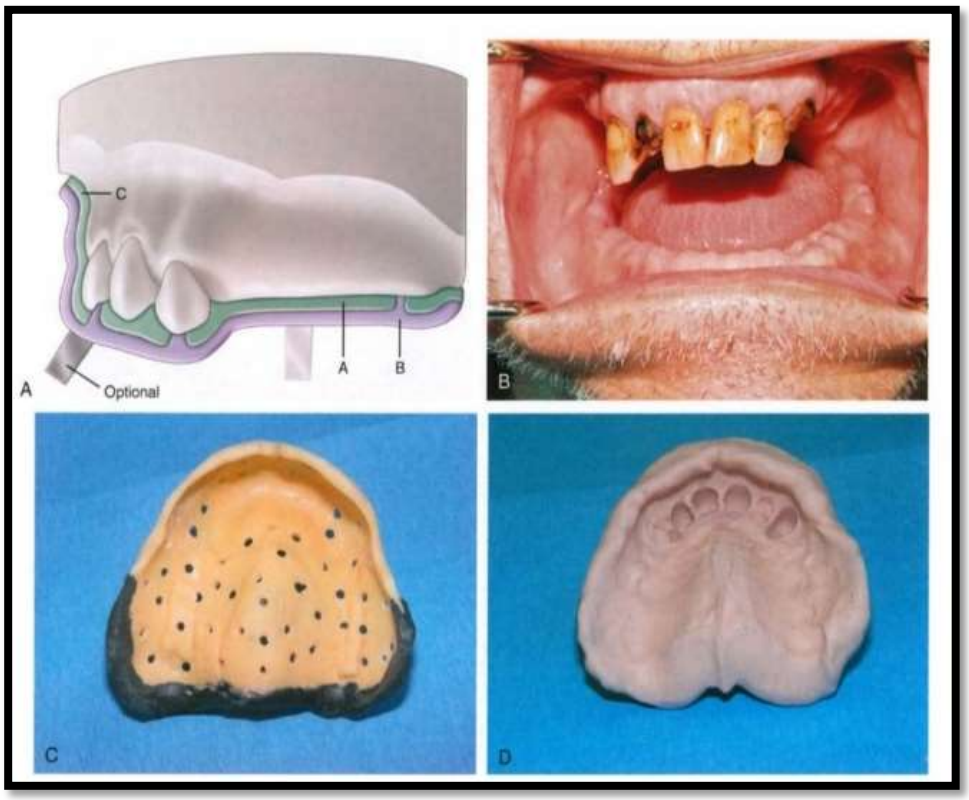

Figure (1.3): Single impression technique: A, Wax relief and design for custom one tray immediate denture impression B, Maxillary anterior teeth are nonsalvageable. Ready for immediate denture impression. C, Immediate denture custom tray perforated and posterior palatal seal enhanced D, Alginate in custom tray impression for immediate denture (Zarb et al., 2013).

B. Dual impression technique

This approach is particularly effective when the anterior teeth are quite mobile and if the position of these teeth would be difficult to capture in a single impression technique. This technique is done by using an impression tray in the posterior portion of the oral cavity to impress the soft tissue only . This tray would then be indexed in such a way that it would connect to an anterior tray that would capture the likeness of the anterior teeth at rest **(Zarb et al., 2013)**. The procedure is as follow:

A• Hard baseplate wax is used to fill in soft tissue undercuts on a study cast of the dental arch and residual ridge.

B• An acrylic tray with an opening for the remaining teeth and a handle grip on both sides is made on the study cast Fig. 1.4, A.

C• The periphery is then modified with impression compound to fit the functional vestibule, the intaglio of the tray is prepared with an adhesive, and the mucosal impression is made with a low-viscosity vinyl polysiloxane Fig. 1.4, C.

D• The tray with the impression is removed from the mouth modified if necessary to remove excess material beyond the denture-supporting area, and repositioned in the mouth to form the posterior part of the dual impression when a stock tray with alginate is placed over the acrylic tray and around the natural teeth Fig. 1.5, D and E.

E• Both impressions are removed together from the mouth, disinfected in 2% gluteraldehyde for 10 minutes, and poured as soon as possible in dental stone because of the instability of the alginate impression Fig 1.5, F **(MacEntee, 2014)**.

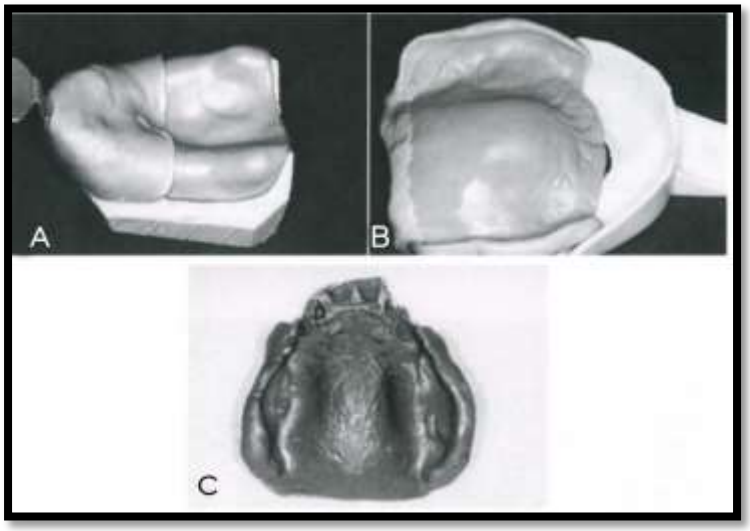

Figure (1.4): Dual impression technique: A and B, Posterior tray for mucosal impression picked up by anterior tray for teeth . C, Posterior mucosal border molded impression (Zarb et al., 2013).

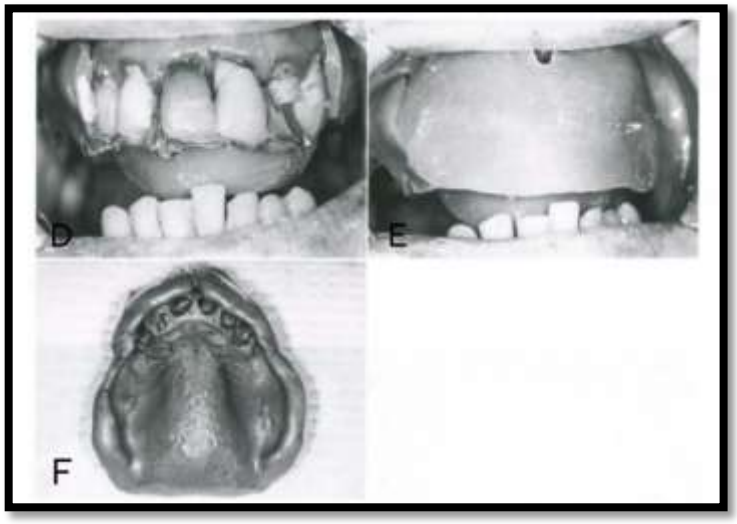

Figure (1.5): Dual impression technique: D, Make sure the posterior impression is accurately replaced in mouth and then covered by anterior sectional tray for teeth. E, Anterior of two trays records anterior anatomy and indexes the posterior impression tray. F, Two trays removed together to make one immediate denture impression (Zarb et al., 2013).

1.11.3. Jaw relations

• In situations where the OVD is to be maintained and patients retain most of their natural teeth with multiple stable contacts which are easily located, then jaw registration can be taken using an appropriate bite registration material.

• Where multiple teeth are missing and the OVD is planned to be re-organized, it is necessary to use wax record blocks which should be well fitting and adapting nicely to the underlying edentulous saddle Fig. 1.6.

• If needed, stability can be enhanced by fixing wire clasps to the wax bases in order to engage the remaining standing teeth **(Jogezai, Laverty and Walmsley, 2018)**.

• A facebow record is made to orient the cast on the articulator.

• A tentative occlusal vertical dimension is obtained.

• Centric relation record is made at a slightly increased vertical dimension using free-flowing medium on the occlusal rim such as zinc oxide eugenol impression paste.

• Lower cast is mounted using this record **(Prakash and Gupta, 2017)**.

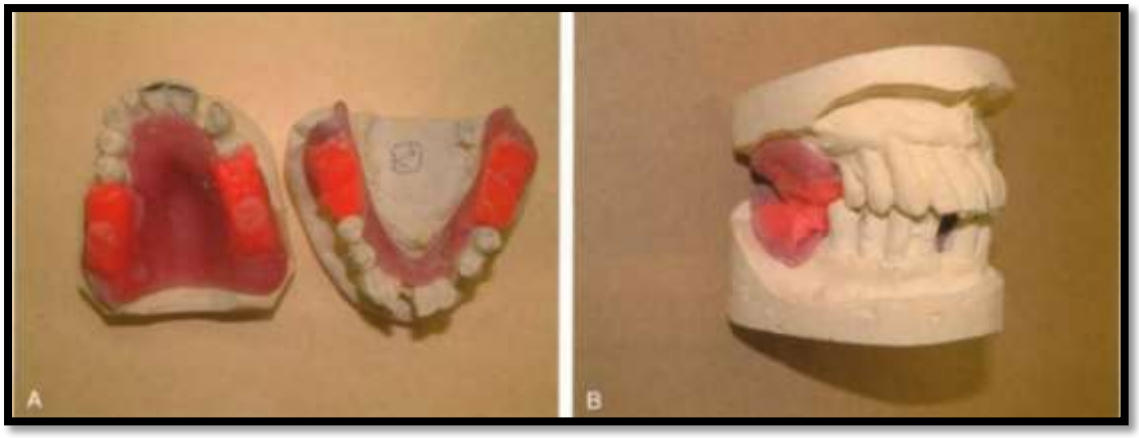

Figure (1.6): A and B, Centric relation record (Nayak et al., 2020).

1.11.4. Selection and arrangement of the teeth

• Shape, size and shade of the teeth are selected using the existing dentition of the patient.

• Appropriate teeth are selected and arranged so as to provide bilateral posterior contacts in centric relation **(MacEntee, 2014)**.

•The clinician is advised to carefully assess the patient's facial midline and to establish the midline of the immediate denture in that same position and orientation.

•Phonetics and facial support will all be considered when confirming the vertical and horizontal positions **(Zarb et al., 2013)**.

1.11.5. Wax try-in

• Any clinical, technical or aesthetic issues should be addressed prior to construction of the prosthesis.

• May not be possible in all cases due to the fact that the teeth have not been extracted, thus, the patient should be shown the waxed-up prosthesis on the articulated casts to give an idea of what the final result is likely to be **(George et al., 2010)**.

• Posterior try-in is done to verify the centric relation and the vertical dimension of occlusion Fig. 1.7.

• Position of the posterior palatal seal is verified and scribed on the cast **(Prakash and Gupta, 2017)**.

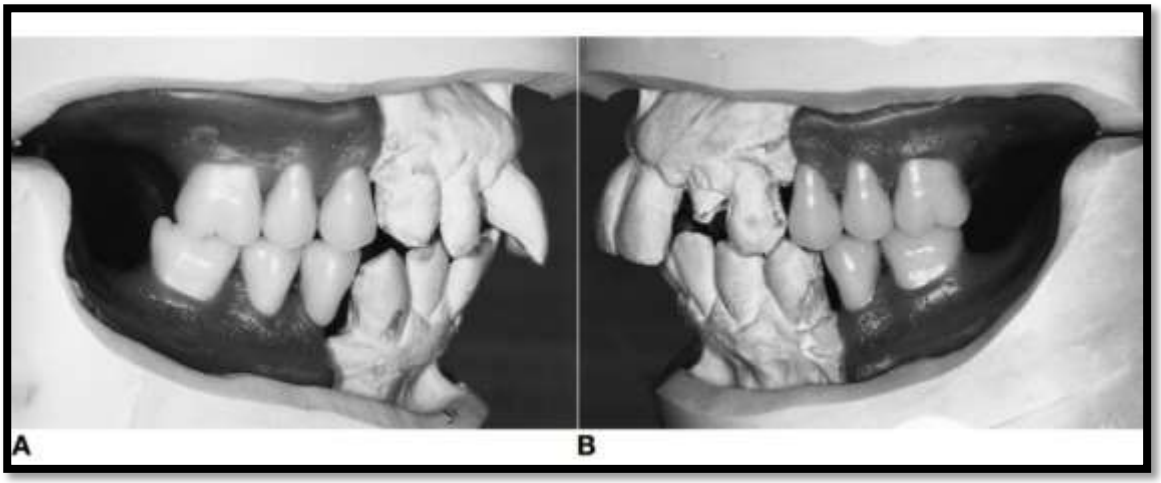

Figure (1.7): A and B, Posterior tooth setup for a try-in for conventional immediate dentures (Zarb et al., 2004).

1.11.6. Surgical Template

In order to achieve the desired shape of the alveolar ridge, a surgical template or matrix can be utilized at the time of surgery. This will help determine the need for bone recontouring associated with unwanted undercuts that would otherwise be problematic for the patient in terms of denture insertion and removal. The template can be fabricated from a duplicate of the working cast using clear thermoplastic material or autopolymerizing clear poly methyl methacrylate. At the

time of extraction, the clear template is placed to check for tissue blanching Fig. 1.8. This allows the surgeon to detect areas that require recontouring and make adjustments to the alveolus before inserting the immediate prosthesis **(Bissasu, 2004)**.

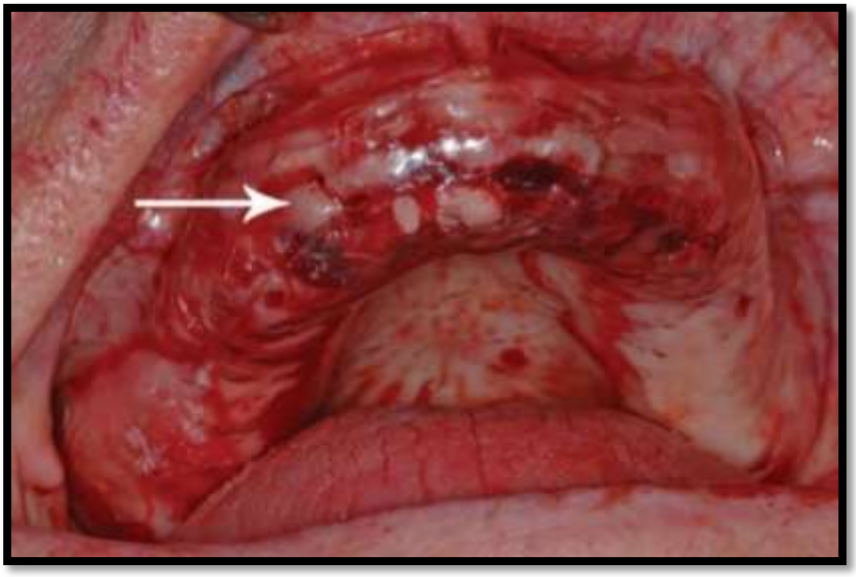

Figure (1.8): A Surgical template: The arrow indicates blanching of the tissue (Rahn, Ivanhoe and Plummer, 2009).

1.12. Laboratory procedures

• The midline has been marked in pencil on the cast.

•The posterior teeth will already have been arranged; consequently, the remaining teeth may be removed from the stone cast and the cast adjusted to simulate the soft and hard tissue contours that would be anticipated following removal of teeth Fig. 1.8, B **(Zarb et al., 2004)**.

• Wax-up of the denture is done to provide adequate thickness and proper contour of the denture base Fig. 1.9, C to F.

• The upper labial border of the denture is filled with wax according to the fullness of the border on the cast.

• An adequate thickness of the denture border is necessary to protect the patient's tissues if edema follows the removal of teeth and insertion of the denture.

• The fullness of the denture border is reduced after completion of the denture.

• Flasking is performed in the usual way, followed by wax boil out and cleaning.

•The dentures are then processed and resulting changes in occlusion are corrected before removal of the dentures from their casts for finishing.

• Articulating paper locates any deflective occlusal contacts in centric occlusion, and these are ground away with small mounted stones.

• Before any surgery is undertaken, the labial flange of the denture must be thinned to a minimum. However, the border must be well rounded.

• The prominences on the inner surface, representing the locations of the fresh tooth sockets are trimmed.

• The inner surface of the denture is reduced whenever socket prominences protrude.

• The finished denture is stored in a disinfectant solution and is thoroughly cleaned before insertion **(George, 2019)**.

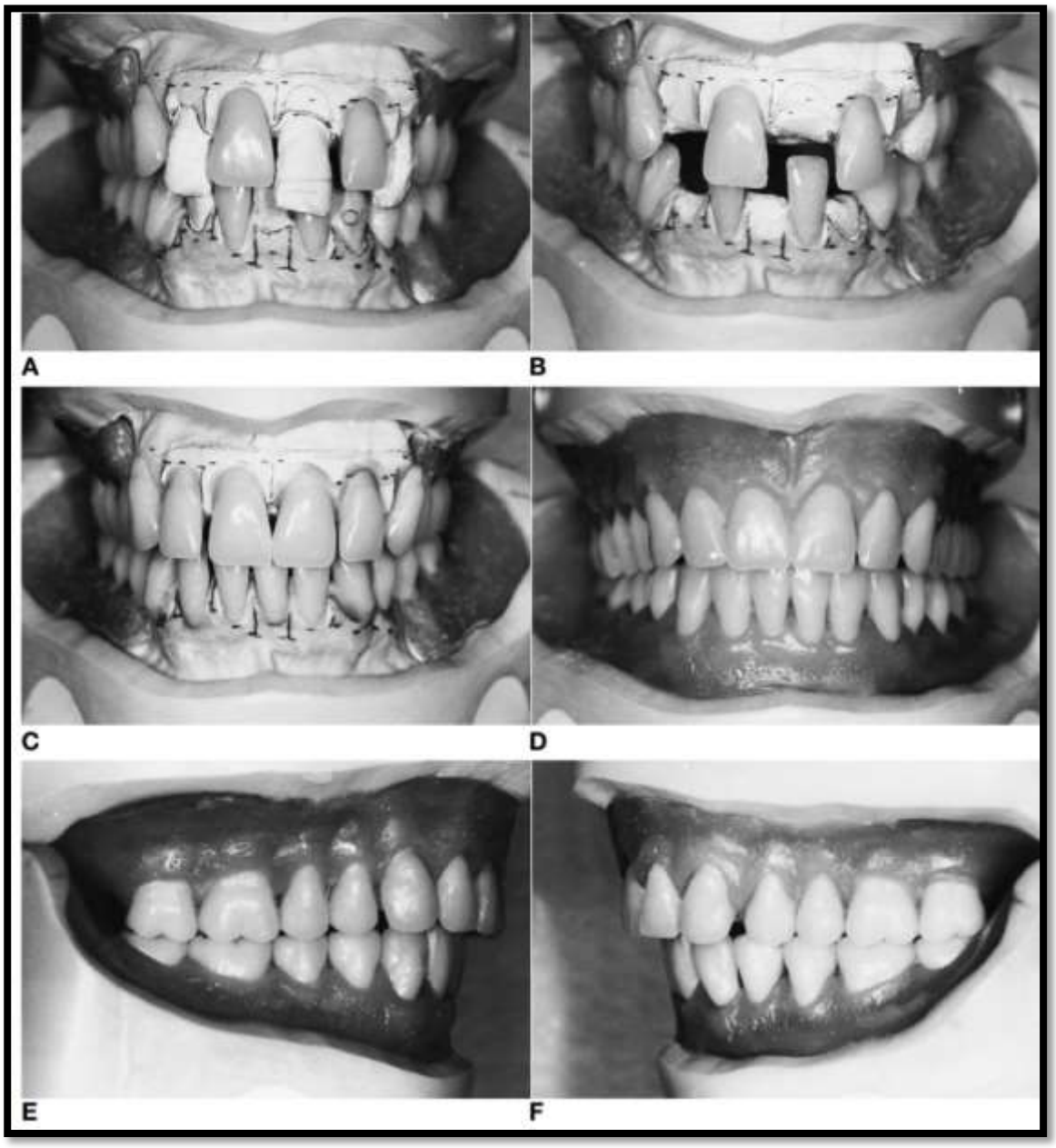

Figure (1.9): Laboratory procedure of immediate denture: A, Every other tooth is set on the maxillary and the mandibular casts. B, The remaining teeth are removed. C to F, The setup is completed and waxed-up (Zarb et al., 2004).

1.13. Surgical procedures

After the immediate denture is polymerized, processed and polished, the remaining anterior teeth are extracted. If a smaller number of teeth is extracted, it is sufficient to compress the extraction alveoli with the fingers, using sterile gauze. When several teeth are extracted, it is best to make situation stitches. Very pronounced interdental or interradicular septa should be carefully reduced, preserving the bony tissue **(Kraljević et al., 2001)**.

1.13.1. Indications for surgical interference

These conditions may require surgery if present :

1.Pathologic conditions.

2.Esthetics, whereby the reduction of the labial and buccal alveolar bone will permit the proper alignment of the artificial teeth.

3. Mechanical reasons, such as the reduction of large bony protuberances.

4. Ridge relation, or surgical correction will often assist harmonizing the ridges and permit a more ideal articulation of the artificial teeth.

5. Abnormal muscle or frenum attachments.

6. Soft flabby ridges **(Hassaballa, 2010)**.

1.14. Insertion of immediate denture

• Adequately anaesthetizing the surgical site.

• Tooth removal should be as atraumatically as possible to maintain the integrity of the labial and palatal or lingual bony plates.

• Bony spicules or sharp edges are removed with minimal trauma.

• The surgical template will be inserted before closure of the surgical site and any areas of tissue blanching, which will be evident through the clear template, should be corrected **(Zarb et al., 2013)**.

• The immediate denture will then be inserted on a trial basis and should be checked for retention, support and stability. The occlusion should be checked both in retruded contact position, where there are no stable occlusal contacts, as well as in lateral excursions, and any interferences corrected Fig. 1.10 **(Kraljeviê et al., 2001)**.

• The patient is instructed not to remove the denture for first 24 h **(Zarb et al., 2013)**.

Figure (1.10): Insertion of immediate denture after surgery (Rahn, Ivanhoe and Plummer, 2009).

1.15. Postoperative Care and Patient Instructions

1.15.1. First 24 hours

1-First 24 Hours The patient should avoid rinsing, avoid drinking hot liquids or alcohol, and not remove the immediate denture during the first 24 hours.

2-Ice packs can be used on the first day to control inflammation, swelling, and Discoloration. are likely to occur, their partial control can be helped with ice packs (20 minutes on,20 minutes off) on the first day **(Zarb et al., 2004)**.

3-The patient should be reminded that the pain from the trauma of extraction would not be eliminated by removal of the dentures from the mouth. Analgesic medications are prescribed as required **(Holt, 1986)**.

4-Patients should be alerted to expect minimal blood during the first night, but troublesome hemorrhaging is rare because the denture acts as a bandage **(Zarb et al., 2004)**.

The following should occur at the 24-hour visit:

1. Ask patients where they feel sore.

2. Quickly check the tissues for sore spots related to the denture; these will appear as strawberry-red spots.

3. These areas may be related to the denture bases visually or with the adjunctive use of pressure indicator paste. The corresponding areas are relieved in the acrylic resin. The denture should be kept out of the mouth only for a very short time.

4. Adjust any gross occlusal discrepancy in centric relation or excursions.

5. Reevaluate the denture for retention. Place a tissue conditioner if denture retention is unsatisfactory **(Nayak et al., 2020).**

1.15.2. First postoperative week

1• Counsel the patient to continue to wear the immediate denture at night for 7 days after extraction or until swelling reduction. This ensures that a recurrence of nocturnal swelling will not preclude reinserting the denture in the morning.

2• Starting immediately after the 24-hour visit, the patient should be shown how to remove the denture after eating to clean it and to rinse the mouth at least three to four times daily to keep the extraction sites clean.The denture should then be quickly reinserted and worn continuously.

3• After 1 week, sutures can be removed , and the patient can begin removing the denture at night **(Zarb et al., 2004)**.

1.16. Further follow-up care

1• During the first month after insertion, the patient is seen on request or else weekly as required for sore spot adjustments.

2• Denture adhesives can be used during this period as an aid if retention is lost between visits **(Zarb et al., 2004)**.

3• Relines can be required as early as 4−6 weeks.

4• After 3−6 months post-extraction, the denture may loosen further and require rebasing or fabrication of a new prosthesis. this should be delayed until further bone resorption is unlikely to occur otherwise the new prosthesis will quickly suffer the same fate.

5• A large amount of early bone resorption may cause significant loss of retention. A transitional/interim denture can be used till bony remodelling is complete, at which stage a new permanent conventional removable prosthesis can be fabricated **(Creaven et al., 2013)**.

1.17. Digital Immediate Denture

Several procedures have been described to provide an immediate denture **(Racka and Esposito, 1995)**., but conventional methods of fabricating dentures have not changed in the past 50 years. The process typically involves multiple clinical appointments and lengthy laboratory procedures, with each of the steps involved requiring considerable time and material. Therefore, the entire process is subject to human processing errors, inaccuracies, and additional time and cost **(Neumeier and Neumeier, 2016)**.Recently, computer-aided design and computer aided manufacturing (CAD-CAM) technology has been used to fabricate complete dentures. The information needed for a CAD-CAM restoration in edentulous jaws is acquired extraorally from an impression or from a stone cast using laboratory scanners **(Goodacre et al., 2012)**.This technique has the same deficiencies as

conventional impressions and stone casts **(Güth et al., 2013)**.To avoid errors in the CAD-CAM production workflow, digitalizing directly from the patient's mouth using intraoral scanners would be more practical **(Quaas et al., 2007)**.

1.18. Clinical Report

A 62-year-old man presented with a complete maxillary denture and a mandibular removable partial denture. Clinical examination and radiographic assessment revealed an unrestored mouth with generalized severe chronic periodontitis and carious, non restorable mandibular teeth supporting the removable partial denture Fig. 1.11 **(Fang et al., 2017)**.

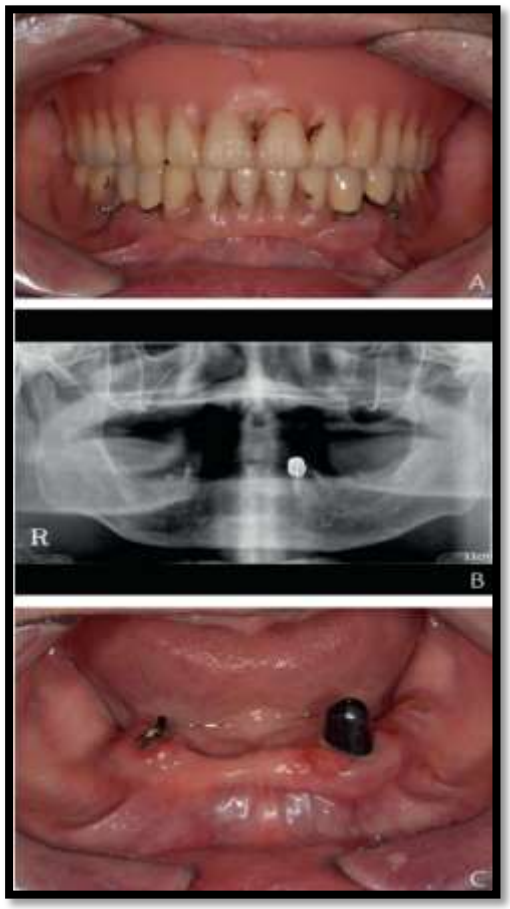

Figure (1.11): Initial examination of the patient: A, Clinical view. B, Panoramic radiograph. C, After removing mandibular removable partial denture (Fang et al., 2017).

Several treatment options for the mandible were presented to the patient, including extraction of all his remaining teeth and the fabrication of complete dentures, implant-retained prostheses, and overdentures. All options were discussed with the patient, who chose immediate denture treatment. The 3-dimensional (3D) intraoral data of the patient were acquired using an intraoral scanner. To obtain digital impressions of the vestibular areas, the scan was made after retracting the lips and cheeks with the scanner head while maximally stretching the vestibular area with a retractor. After scanning the mandibular arch, the opposing maxillary denture was scanned. The existing occlusal vertical dimension (OVD) was used. To maintain the OVD, a virtual occlusal record was registered by optically scanning the labial surfaces of the mandibular teeth and the opposing maxillary denture teeth Fig. 1.12. **(Fang et al., 2017)**.

Figure (1.12): Virtual occlusal registration. Occlusal registration scan image. (Fang et al., 2017).

The scanned mandibular arch and opposing maxillary denture images were then virtually aligned using the virtual occlusal record as a reference. The digital mandible and its relationship with the opposing teeth was now complete Fig. 1.13. After obtaining the virtual casts mounted at the desired OVD, the remaining teeth images were deleted in the virtual 3D image of the mandible Fig. 1.14, A and B **(Fang et al., 2017)**.

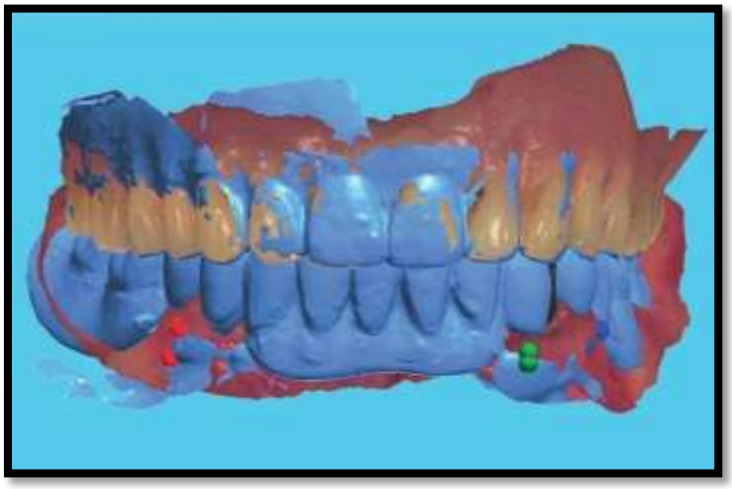

Figure (1.13): Scanned mandible and opposing arch. Scanned images aligned using occlusal registration as reference (Fang et al., 2017).

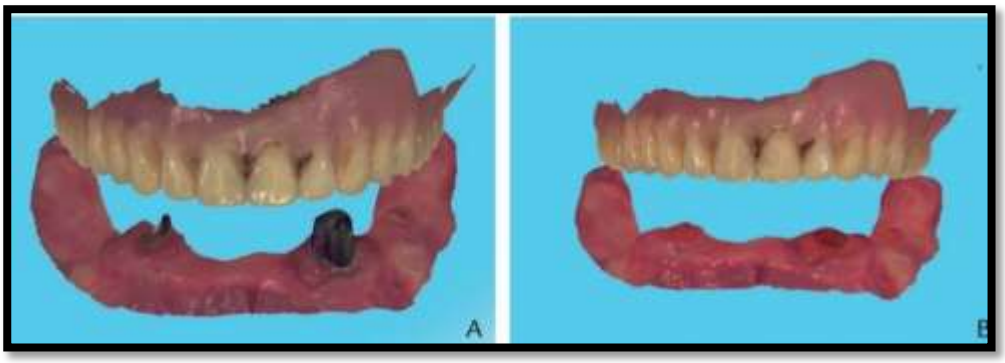

Figure (1.14): A and B, Scanned mandible and opposing arch images mounted at occlusal vertical dimension: A, Before deleting remaining mandibular teeth B, After deleting remaining mandibular teeth (Fang et al., 2017).

The obtained data were imported into denture planning software to design the complete denture. The mandibular denture base and teeth were virtually designed with the software Fig. 1.15. The program allowed for occlusal adjustment with a virtual articulator. More accurate denture teeth were prepared by simulating mastication using the virtual articulator Fig. 1.16 **(Fang et al.,2017)**.

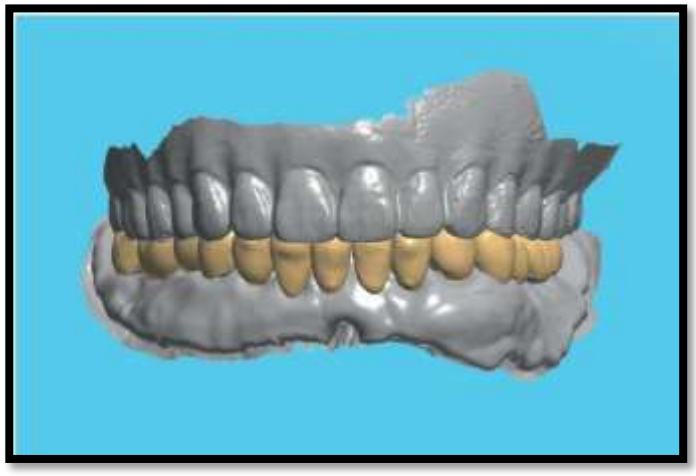

Figure (1.15): Virtual design of denture base and teeth (Fang et al., 2017).

Figure (1.16): Virtual articulator setting (Fang et al., 2017).

The denture base was milled from a pink disk of polymethyl methacrylate (PMMA). The teeth were also milled from PMMA disks with the same milling machine and fine milling tools. The milled teeth were bonded onto the milled denture base with a resin cement. After fabricating the denture, all the remaining teeth were extracted according to the treatment plan, and excess bone and gingival tissues were removed. Interrupted sutures were then placed with 4.0 black silk sutures. The mandibular digital immediate denture was inserted after the suturing **(Fang et al., 2017)**.

Minimal chair-side adjustments were made to the internal surface, borders, and undercut areas of the immediate denture with a soft tissue conditioning material . After 7 days, the sutures were removed, and the denture was relined. Chair-side with a hard reline material (Tokuyama Rebase;Tokuyama Dental) after the tissue-conditioning material had been eliminated Fig. 1.17. The retention of the denture base was excellent. The patient had no difficulty with mastication and was pleased with the esthetic outcome of his dentures **(Fang et al., 2017)**. The procedure improves the stability and retention of the prosthesis and allows dentists to acquire data easily for fabricating dentures.

Figure (1.17): Relined mandibular digital immediate denture in place (Fang et al., 2017).

Chapter two

Conclusion

Conclusion

1• Immediate denture treatment can be highly successful with proper planning, attention to detail, also, good patient/provider communication and explanation of the related procedures and how they are sequenced can be beneficial to patients as they transition to a state of edentulism.

2• A stable foundation can be achieved with serial extractions and contouring the posterior ridges to support the denture base. Using modified custom impression trays and the final impression helps operators achieve the desired working cast.

3• As digital technology improves, treatment will become more streamlined, with less chairtime for both the clinician and patient.

4• The patient should be made aware that maintaining good oral hygiene and following the dentist's recommendations will help minimize soft tissue irritation and ensure proper function and satisfaction.

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