

## DIAGNOSIS & TREATMENT PLANNING OF REMOVABLE PARTIAL DENTURES (R.P.Ds).

**Diagnosis:** the determination of the nature of a disease.

**Treatment plan:** the sequence of procedures planned for the treatment of a patient after diagnosis.

The delineation of each patient's uniqueness occurs through the patient interview and diagnostic clinical examination process.

This includes four distinct processes:

1. Understanding the patient's desires or chief concerns/complaints regarding his or her condition (including its history) through a systematic interview process.
2. Ascertaining the patient's dental needs through a diagnostic clinical examination.
3. Developing a treatment plan that reflects the best management of desires and needs (with influences unique to the medical condition or oral environment),
4. Executing appropriately sequenced treatment with planned follow-up.

### **PATIENT INTERVIEW**

The interview, an opportunity to develop rapport with the patient, involves listening to and understanding the patient's chief complaint or concern about his or her oral health. This can include clinical symptoms of pain, difficulty with function, concern about appearance, problems with an existing prosthesis, or any combination of symptoms related to the teeth, periodontium, jaws, or previous dental treatment. It is important to listen carefully to what the patient has stated is the reason for presenting for evaluation.

Although formats for sequencing the patient interview (and clinical examination) vary, to ensure thoroughness the dentist should follow a sequence that includes:

1. Chief complaint and its history.
2. Medical history review.
3. Dental history review, especially related to previous prosthetic experience.
4. Patient expectations

### **CLINICAL EXAMINATION**

#### **A. Objectives of Prosthodontic Treatment**

The objectives of any prosthodontic treatment may be stated as follows: (1) the elimination of disease; (2) the preservation, restoration, and maintenance of the health of the remaining teeth and oral tissues (which will enhance the removable partial denture design); and (3) the selected replacement of lost teeth; for the purpose of (4) restoration of function in a manner that ensures optimum stability and comfort in an esthetically pleasing manner.

### B. Extra-oral examination.

It includes a general look at the patient as a whole "his head and face particularly", so we look for any symptoms or deformity of the face. We have to see position of the lips and whether it is short or long also the opening of the mouth. We should examine the facial symmetry, T.M.J with mandibular movement and muscles of mastication.

### C. Intra-oral examination.

A complete oral examination should precede any treatment decisions. It should include visual and digital examination of the teeth and surrounding tissues with a mouth mirror, explorer, and periodontal probe, vitality tests of critical teeth, and examination of casts correctly oriented on a suitable articulator. Clinical findings are augmented by and correlated with a complete intraoral radiographic survey.

### Sequence for Oral Examination:

1. Relief of pain and discomfort and caries control by placement of temporary restorations.
2. A complete oral prophylaxis. An adequate examination can be accomplished best with the teeth free of accumulated calculus and debris. A complete oral examination should be deferred until the teeth have been thoroughly cleaned.
3. Complete intraoral radiographic survey.

#### The objectives of a radiographic examination are:

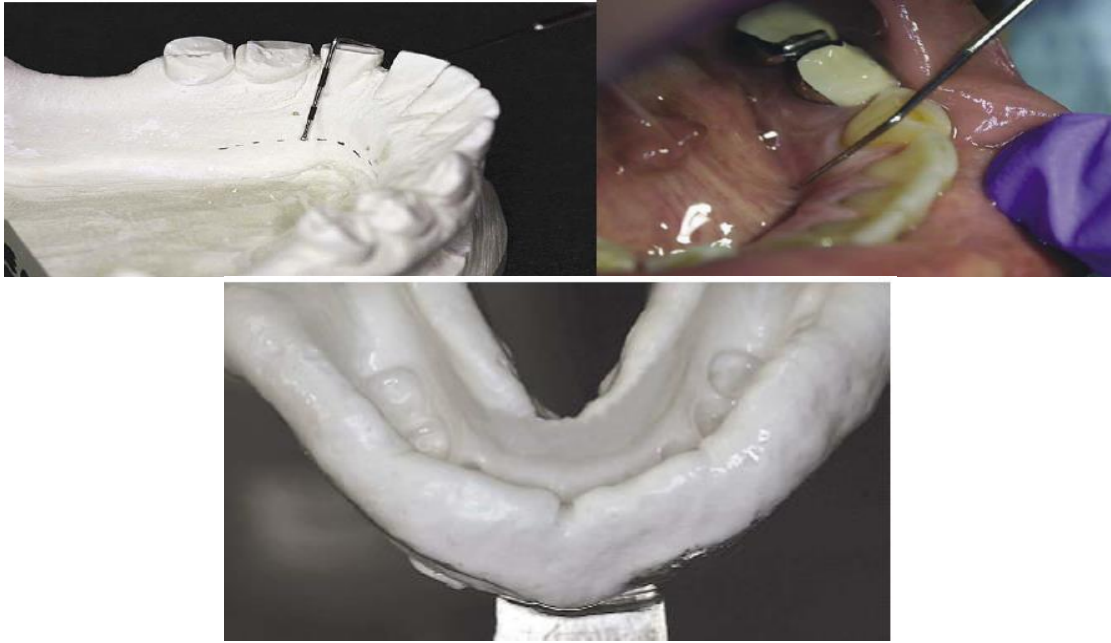
- a. To locate areas of infection and other pathosis that may be present.
  - b. To reveal the presence of root fragments, foreign objects, bone spicules, and irregular ridge formations.
  - c. To reveal the presence and extent of caries and the relation of carious lesions to the pulp and periodontal attachment.
  - d. To permit evaluation of existing restorations as to evidence of recurrent caries, marginal leakage, and overhanging gingival margins.
  - e. To reveal the presence of root canal fillings and to permit their evaluation as to future prognosis (the design of the removable partial denture may hinge on the decision to retain or extract an endodontically treated tooth).
  - f. To permit evaluation of periodontal conditions present and to establish the need and possibilities for treatment.
  - g. To evaluate the alveolar support of abutment teeth, their number, the supporting length and morphology of their roots, the relative amount of alveolar bone loss suffered through pathogenic processes, and the amount of alveolar support remaining.
4. Impressions for making accurate diagnostic casts to be mounted for occlusal examination.
  5. Examination of teeth, investing structures, and residual ridges.
  6. Vitality tests of remaining teeth. Vitality tests should be given particularly to teeth to be used as abutments and those having deep restorations or deep carious lesions. This should be done through both thermal and electronic means.
  7. Determination of the height of the floor of the mouth to locate inferior borders of lingual mandibular major connectors.

**Visual examination will reveal:**

- 1) Signs of dental disease consideration of caries susceptibility are of primary importance. The no. of restored teeth presents signs of recurrent caries initial examination.
- 2) Examination of periodontal disease, gingival inflammation, the degree of gingival recession and muco-gingival relationships should be observed.
- 3) The number of teeth remaining, the location of edentulous area, and the quality of definite bearing on the proportionate amount of support that the RPD will receive from the teeth & the edentulous ridges.
- 4) Tissue contour may appear to present a well-formed edentulous residual ridge, however, palpation often indicates that supporting bone has been resorbed and has been replaced by displaceable, fibrous connective tissue. Such situation is common in max. tuberosity regions. The RPD cannot be supported by tissue that is displaced easily. In preparing mouth this tissue should be recontoured or removed surgically, unless otherwise contraindicated. A small but stable residual ridge is preferable to a large unstable ridge for providing support for the denture.
- 5) The presence of tori or other bony exostosis must be detected & an evaluation of their presence in relation to framework design must be made. Failure to palpate the tissue over the median palatal raphe to ascertain the difference in its displaceability as compared with the displaceability of the soft tissues covering the residual ridges can lead to a rocking, unstable, uncomfortable denture & to a dissatisfied patient. Adequate relief of the palatal major connectors must be planned, and the amount of relief required is directly proportionate to the difference in displaceability of the tissues over the midline of the palate & the tissues covering the residual ridges, or select major connector design not interfere with the presence of tori.
- 6) During the examination, not only each arch but also its occlusal relationship with the opposing arch must be considered separately. A situation that looks simple when the teeth are apart may be complicated when the teeth are in occlusion. For example, an extreme vertical overlap may complicate the attachment of anterior teeth to a maxillary denture. Extrusion of a tooth or teeth into an opposing edentulous area may complicate the replacement of teeth in the edentulous area or may create occlusal interference which will complicate the location & design of clasp retainers & occlusal rests. Such findings subsequently will be evaluated further by careful analysis of mounted diagnostic cast.
- 7) Such an examination will not provide sufficient information to allow a definite diagnosis and treatment plan. For this purpose, a complete charting (case sheet) that includes all previous information.
- 8) Determination of height of the floor of mouth to locate inferior borders of lingual mandibular major connectors. Two methods used in determining the floor of mouth:
  - Direct method
  - Indirect method

The first method is to measure the height of the floor of the mouth in relation to the lingual gingival margins of adjacent teeth with a periodontal probe. When these measurements are

taken, the tip of the patient's tongue should just lightly touch the vermilion border of the upper lip (direct method). The second method is to use an individualized impression tray for which lingual borders are 3 mm short of the elevated floor of the mouth, and then to use an impression material that will permit the impression to be accurately molded as the patient licks the lips (indirect method).



#### D. Diagnostic Casts

A diagnostic cast should be an accurate reproduction of all the potential features that aid diagnosis. These include the teeth locations, contours, and occlusal plane relationship; the residual ridge contour, size, and mucosal consistency; and the oral anatomy delineating the prosthesis extensions.

The diagnostic cast can be obtained by taking an impression which is usually made with an irreversible hydrocolloid (alginate) in a stock (perforated or rim lock) impression tray.

*Diagnostic casts serve several purposes as an aid to diagnosis and treatment planning. Some of these are as follows:*

1. Diagnostic casts are used to supplement the oral examination by permitting a view of the occlusion from the lingual, as well as from the buccal aspect.
2. Diagnostic casts are used to permit a topographic survey of the dental arch that is to be restored by means of a removable partial denture.
3. Diagnostic casts are used to permit a logical and comprehensive presentation to the patient of present and future restorative needs, as well as of the hazards of future neglect.
4. Individual impression trays may be fabricated on the diagnostic casts, or the diagnostic cast may be used in selecting and fitting a stock impression tray for the final impression.
5. Diagnostic casts may be used as a constant reference as the work progresses.
6. Unaltered diagnostic casts should become a permanent part of the patient's record because records of conditions existing before treatment are just as important as are preoperative radiographs.

## DIAGNOSTIC FINDINGS

The information gathered in the patient interview and clinical examination provides the basis for establishing whether treatment is indicated, and if so, what specific treatment should be considered.

### A. Interpretation of Examination Data

As a result of the oral examination, several diagnoses are made that are related to the various tissues, conditions, and clinical information gathered. The integration of these diagnoses serves as the basis for decisions that will ultimately identify the suggested treatment. The treatment decision reflects a confluence of several aspects of the patient's past, present, and potential oral health status. These are as follows:

#### 1. Radiographic Interpretation

It is important to verify by clinical examination disease found through radiographic interpretation. Also, if the clinical examination reveals dental caries and/or periodontal disease, its severity can be confirmed by radiographic interpretation.

The quality of the alveolar support of an abutment tooth is of primary importance because the tooth will have to withstand greater stress loads when supporting a dental prosthesis.

#### 2. Periodontal Considerations

An assessment of the periodontium in general and abutment teeth in particular must be made before prosthetic restoration. One must evaluate the condition of the gingiva, looking for adequate zones of attached gingiva and the presence or absence of periodontal pockets.

#### 3. Caries Risk Assessment Considerations

Caries activity in the mouth, past and present, and the need for protective restorations must be considered.

#### 4. Evaluation of the Prosthesis Foundation—Teeth and Residual Ridge

An evaluation of the prosthesis foundation is required to ensure that an appropriately stable base of sound teeth and/ or residual ridge(s) is provided to maximize prosthesis function and patient comfort.

#### 5. Surgical Preparation

The need for pre-prosthetic surgery or extractions must be evaluated. The same criteria apply to surgical intervention in the partially edentulous arch as in the completely edentulous arch.

### **Extraction of teeth may be indicated for one of the following four reasons:**

- ❖ If the tooth cannot be restored to a state of health, extraction may be unavoidable
- ❖ A tooth may be removed if its absence will permit a more serviceable and less complicated removable partial denture design.
- ❖ Teeth in extreme malposition (lingually inclined mandibular teeth, buccally inclined maxillary teeth, and mesially inclined teeth posterior to an edentulous space) may be removed if an adjacent tooth is in good alignment and if good support is available for use as an abutment.
- ❖ A tooth may be extracted if it is so unesthetically located as to justify its removal to improve appearance.

### 6. Analysis of Occlusal Factors

From the occlusal analysis made by evaluating the mounted diagnostic casts, the dentist must decide whether it is best to accept and maintain the existing occlusion or to attempt to improve on it by means of occlusal adjustment and/or restoration of occlusal surfaces.

### 7. Fixed Restorations

There may be a need to restore modification spaces with fixed restorations rather than include them in the removable partial denture.

Generally any unilateral edentulous space bounded by teeth suitable for use as abutments should be restored with a fixed partial denture cemented to one or more abutment teeth at either end.

Two specific contraindications for the use of unilateral fixed restorations are known. **One** is a long edentulous span with abutment teeth that would not be able to withstand the trauma of the occlusal forces. **The other** is abutment teeth, which exhibit reduced periodontal support due to periodontal disease, which would benefit from cross-arch stabilization.

### 8. Orthodontic Treatment

Occasionally, orthodontic movement of malposed teeth followed by retention through the use of fixed partial dentures makes possible a better removable partial denture design mechanically and esthetically than could otherwise be used.

### 9. Need for Determining Type of Mandibular Major Connector

One of the criteria used to determine the use of the lingual bar or linguoplate is the height of the floor of the patient's mouth when the tongue is elevated.

### 10. Need for Reshaping Remaining Teeth

The clinical crown shapes of anterior and posterior teeth are not capable of supporting a removable partial denture framework without appropriate modification. Without the required modifications, the prosthesis does not adequately benefit from the support and stability offered by the teeth and consequently will not be comfortable to the patient.

## B. Indications for Removable Partial Dentures

Although a removable partial denture should be considered only when a fixed restoration is contraindicated, there are several specific indications for the use of a removable restoration:

### 1. Distal Extension Situations

The most common partially edentulous situations are the Kennedy Class I and Class II which have an edentulous space on the opposite side of the arch is often conveniently present to aid in required retention and stabilization of the removable partial denture.

### 2. After Recent Extractions

The replacement of teeth after recent extractions often cannot be accomplished satisfactorily with a fixed restoration. When relining will be required later, or when a fixed restoration using natural teeth or implants will be constructed later, a temporary removable partial denture can be used.

### 3. Long Span

A long span may be totally tooth supported if the abutments and the means of transferring the support to the denture are adequate, and if the denture framework is rigid.

### 4. Need for Effect of Bilateral Stabilization

The removable partial denture, on the other hand, may act as a periodontal splint through its effective cross-arch stabilizing of teeth weakened by periodontal disease.

### 5. Excessive Loss of Residual Bone

Whenever excessive resorption has occurred, teeth supported by a denture base may be arranged in a more acceptable buccolingual position than is possible with a fixed partial denture. A removable partial denture will permit the location of the replaced teeth in a favorable relation to the lip and opposing dentition regardless of the shape of the residual ridge.

### 6. Unusually Sound Abutment Teeth

Sometimes the reasoning for making a removable restoration is the desire to see sound teeth preserved in their natural state and not prepared for restorations.

### 7. Abutments With Guarded Prognoses

The questionable tooth may then be included in the original design and, if subsequently lost, the removable partial denture can be modified or remade. Most removable partial denture designs do not lend themselves well to later additions, although this eventuality should be considered in the design of the denture.

### 8. Economic Considerations

A prosthesis that is made to satisfy economic considerations alone may provide only limited success and result in more costly treatment in the future.

## **C. Differential diagnosis for fixed or removable partial denture**

Although replacement of missing teeth by means of partial denture either tooth or implant supported is generally the method of choice, there are many reasons why a RPD may be better method of treatment for specific patient. The choice of treatment must meet the economic limitations and personal desires of the patient. Although uncommon, unilateral RPD in place of fixed partial denture. This type of prosthesis places excessive stresses on abutment teeth , possibly more important, the risk for aspiration is significant if such prosthesis dislodge during use. For these reasons the use of unilateral RPD is strongly discouraged.

## Treatment plan

After evaluating the clinical and derived diagnosis, the method of the treatment that would best suit the patient is determined. The outline of treatment is framed before starting the treatment. Prosthodontic treatment for partially edentulous patient's can be divided into six separate steps or stages:-

- Phase I- collection and evaluation of diagnostic data
  - treatment of emergency conditions.
  - determining the type of the prosthesis to be fabricated.
  - patient motivation
- Phase II- pre-prosthetic mouth preparation.
  - making the primary impression.
  - patient motivation.
- Phase III- designing the RPD
- Phase IV- prosthetic mouth preparation
  - making the final impression.
  - Patient motivation.
- Phase V- fabrication of RPD
- Phase VI- insertion
  - Post insertion management
  - Periodic recall and review.