

Crown And Bridge Prosthodontics

Lecture. 13

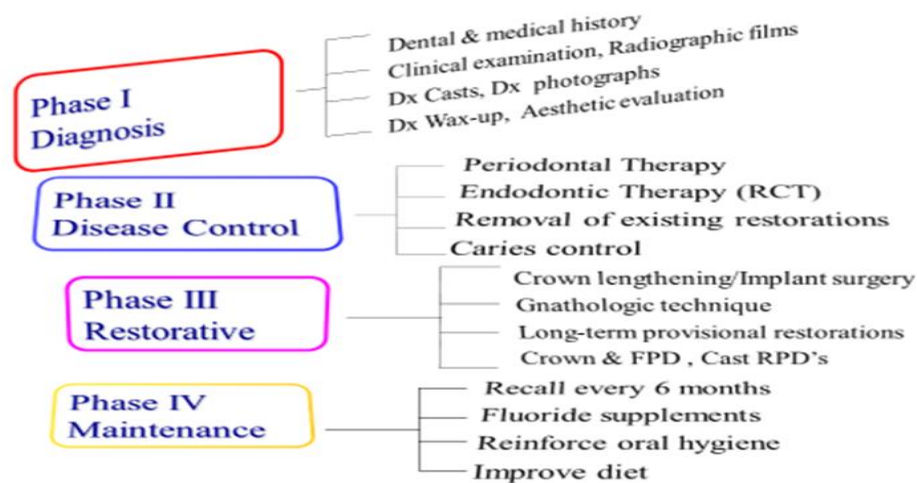
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DIAGNOSIS AND TREATMENT PLANNING IN FIXED PROSTHODONTICS

Successful management of cases begin with a thorough assessment of the patient's physical and psychological condition and determining a treatment that will satisfy the realistic expectations of the patient

- **Diagnosis**
 - ⊙ The determination of the nature of a disease.
- **Treatment plan**
 - ⊙ The sequence of procedures planned for the treatment of a patient after diagnosis

Treatment Plan by Phases



FIVE ELEMENTS OF DIAGNOSIS

- HISTORY
 - Clinical examination
 - TMJ & EXTRAORAL EVALUATION
 - INTRA ORAL EXAMINATION
- DIAGNOSTIC CASTS
- RADIOGRAPHIC EXAMINATION
- Dx photographs, Dx Wax-up, Aesthetic evaluation

DATA COLLECTION

- 1) Personal information
- 2) Dental History
- 3) Medical History

CHIEF COMPLAINT

The accuracy and significance of the patient's primary reason or reasons for seeking treatment should be analyzed first

FOUR CATEGORIES of chief complaint

- **COMFORT** (pain, sensitivity, swelling)
- **FUNCTION** (Difficulty in mastication or speech)
- **SOCIAL** (Bad taste or odor)
- **APPEAREANCE** (Fractured or unattractive teeth or restorations , discoloration)

CLINICAL EXAMINATION

consist of the clinician's use of sight, touch, and hearing to detect conditions outside the normal range.

General appearance:

- *Gait and weight are assessed.*
- *Skin color : Anemia or jaundice.*
- *Vital signs: Respiration, pulse, temperature and blood pressure are measured and recorded.*

EXTRAORAL EXAMINATION

- *FACIAL ASYMMETRY*
- *CERVICAL LYMPHNODES*
- *TMJ*
- *MUSCLS OF MASTICATION (palpated*

DIAGNOSTIC AIDS

- *RADIOGRAPHS*
- *VITALITY TEST*
- *DIAGNOSTIC CASTS*
- *PERIODONTAL PROBE*

Pulpal health must be measured before restorative treatment to

- *PERCUSSION and*
- *THERMAL STIMULATION*
- *VITALITY TESTS*

RADIOGRAPHIC EXAMINATION;

The radiograph should be examined carefully for caries , presence of P.A lesion , the quality of the previous endodontic treatment , alveolar bone level, crown-root ratio , root configuration ,direction of root, Number can be examined ,also the presence of retained root in edentulous areas should be recorded

Summary of supplement information, to clinical information, provides by radiographic examination, during this diagnosis phase, are

- *Extent of bone support*
- *Root morphology*
- *Peri apical pathology*

PANOROMIC RADIOGRAPHS

- *Presence or absence of teeth*
- *Assessing third molars impactions,*
- *Evaluating the bone before implant placement.*
- *Screening edentulous arches for buried root tips.*

Diagnostic Casts Examination;

They should be mounted on a semi adjustable articulator

Advantages;

- 1) *Allow an un obstructed view of the edentulous space*
- 2) *Allow accurate assessment of the span length and the curvature of the ridge or arch in the edentulous region*
- 3) *The shape and length of the abutment teeth can be measured to determine which preparation design will provide adequate retention and resistance.*
- 4) *Evaluate path of insertion (axial inclination of abutment) to determine the need for any modification.*
- 5) *No., size and location of wear can be evaluated.*

- 6) *Over erupted teeth can be easily spotted and the amount of correction needed can be determine.*
- 7) *Evaluate occlusion and Interocclusal space necessary to re-establish a proper occlusal plane.*
- 8) *Evaluate the need for any occlusal correction.*
- 9) *Used for diagnostic wax-up.*
- 10) *Construction of special try and provisional restoration.*

Diagnostic photographs

There is much diagnostic information to be gained by including photography to comprehensive treatment planning. It allows the practitioner to show the patient a photograph (s) concerning his complain or problem immediately , thereby helping the patient to co-diagnose, understand their needs and complications much better when they can see a picture of their own pathology work with the patient chairside while showing his problem and discus the treatment.

What is an Ideal Treatment plan?

Treatment plan that achieves the best possible long-term outcomes for the patient, while addressing all patient concerns and active problems, with the minimum necessary intervention.

MOUTH PREPARATION

Mouth preparation refers to the dental procedure that need to be accomplished before fixed prosthodontics can be properly undertakenAs a general plan , the following sequence of treatment procedures in advance of fixed prosthodontic should be adhered to;

- 1) *Relief of symptoms (chief complaint)*
- 2) *Removal of etiological factors (eg; excavation of caries removal of deposits)*
- 3) *Repair of damage .*
- 4) *Maintenance of dental health.*

The following list describes the sequence in the treatment of a patient with extensive dental disease including missing teeth , retained roots , caries and defective restorations.

- *Preliminary assessment*
- *Emergency treatment of presenting symptoms*
- *Oral surgery*
- *caries control and replacement of existing restorations*
- *Definitive periodontal treatment*
- *Orthodontic treatment*
- *Definitive occlusal treatment*
- *Fixed prosthodontics*
- *Removable prosthodontics*
- *Follow up care .*

SELECTION OF THE TYPE OF THE POSTHESIS

FACTORS CONSIDERED

- **BIOMECHANICAL**
- **PERIODONTAL**
- **ESTHETIC**
- **FINANCIAL and PATIENTS WISHES.**

Selection should not be less than optimum just because the patient cannot.

Sound alternative to the preferred treatment plan and not apply pressure.

SELECTION OF THE TYPE OF THE PROSTHESIS

➤ CONVENTIONAL TOOTH SUPPORTED FIXED PARTIAL DENTURE

- 1) Abutment teeth are periodontally sound.
- 2) Edentulous span is short and straight.
- 3) Expected to provide a longlife of function for the patient.
- 4) No gross soft tissue defect in the edentulous ridge.
- 5) Reserved for patients who are both highly motivated and able to afford

➤ RESIN BONDED TOOTH SUPPORTED FIXED PARTIAL DENTURE

- 1) Defect free abutments where single missing tooth.
- 2) A single molar (muscles are not well developed).
- 3) Mesial and distal abutment are present.
- 4) Moderate resorption and no gross soft tissue defects on edentulous ridges.
- 5) Younger patients whose immature teeth with large pulps are poor risks for endodontic free abutment preparation.
- 6) Tilted tooth can be accommodated only if there enough tooth structure to allow a change in the normal alignment of axial reduction.
- 7) Periodontal splints

➤ Removable partial denture abutment

- 1) Edentulous spaces greater than two posterior teeth.
- 2) Anterior space greater than four Incisors.
- 3) Edentulous space with no distal abutment.
- 4) Multiple edentulous spaces.
- 5) Tipped teeth adjoining edentulous spaces and prospective abutments with divergent alignment

➤ IMPLANT SUPPORTED FIXED PARTIAL DENTURE

- 1) Insufficient number of abutments.
- 2) Partial attitude and or a combination of intra oral factors make a removable partial denture or FPD a poor choice.
- 3) No distal abutment.
- 4) Alveolar bone with satisfactory density and thickness in a broad, flat ridges.
- 5) Configuration that permit implant placement.
- 6) Single tooth where defect free adjacent teeth.
- 7) A span length of two or six teeth can be replaced by multiple implants.
- 8) Pier in an edentulous span (three or more teeth long).

It is not uncommon to combine two types in the same arch.

In cases where the choice between a fixed partial denture and a removable partial denture is not clear cut, two or more treatment options should be presented to the patients along with their advantages and disadvantages

The prosthodontist is the best person to evaluate the physical and biological factors present , while the patients feelings should carry considerable weight on matters of esthetics & finances **NO PROSTHETIC TREATMENT ???!!!!!!**

- 1) Long standing edentulous space into which there has been little or no drifting or elongation of the adjacent teeth.
- 2) If the patients perceives no functional, occlusal or esthetic impairment.

Failure in crown & bridge Prosthodontics

Failure in crowns and bridges should be regarded as a disadvantages and balanced against advantage, some bridges are failure from the day they inserted while others last over 40 years.

Manifestations of failure

Failure might manifested itself in one or more of following patient complaint;

- Pain
- Inability to function
- Dissatisfaction with esthetics
- Broken teeth and/or restoration
- Inflammatory swelling
- Bad taste
- Bad breath
- Bleeding gums
- Anxiety

Patient complaint might be Immediate or Delayed

Causes of fixed prosthesis failure

- Improper case selection
- Faulty diagnosis and treatment plan
- Inaccurate clinical or laboratory procedures
- Poor patient care and maintenance following insertion

For purpose of discussion the reasons for failure of fixed prosthesis may be divided into biological and mechanical problems, while mechanical in general, are more directly under the control and influences of clinician the biological problems are not easily controlled and in some instances may be unrelated to the prosthesis, however it is true and many time that, the biological problems may be a consequence of the treatment procedure (pulpal) or of the restoration itself (periodontal or caries).

A) Biological problem

1. Caries;

It is the most common cause of failure of fixed restorations, its detection very difficult whether clinically or radiographically practically when complete coverage is used

Causes;

- a) Open and over or under extended margin (short or long margin); her fluid seepage could occur lead to dissolution of cement that give an area for food debris impaction this defiantly result in caries.
- b) Lose of retention as result of marginal seepage.
- c) High risk patient (high caries index) because of poor oral hygiene.
- d) Reduce salivary flow.
- e) Perforation of restoration (structural durability)

2. Pulpal injury (problem)

Pulpal problem is not uncommon complication in bridge work. it might be the outcome of microbial, chemical, mechanical and thermal irritation. It should be always expected and most often associate with small teeth, in favor of structural duality and periodontal health a massive reduction is necessary so good evaluation is important. Teeth with questionable pulp go and do root canal treatment, anyhow, pulpal pain and discomfort should expected to last sometime to sex months. To verified pulpal pain vitality test should done

- Full crown-----thermal
- Partial crown -----electrical
- Radio graphical-----to see periapical whether infected or not

Causes of pulpal problem

- I. Overheating and heat generation
 - a) Lack of coolant.
 - b) Very high speed
 - c) Insufficient bure
 - d) direct temporary crown
- II. Improper or absence of temporary protection
- III. Irritating cementing agent
- IV. Over reduction, insufficient tooth structure to protect pulp or microscopic pulpal exposure
- V. Recurrent caries under full crown, microbial irritation.
- VI. Traumatic occlusion.

3. Periodontal and soft tissue problems

Periodontal breakdown may lead to loss of abutment. **Patient suffer from;**

- *Mobility of abutment*
- *Periodontal pocket formation*
- *Periodontal abscess*
- *Pain which prevent mastication at the side of restoration*
- *Bad odor and taste*

The most common cause for periodontal problems are

- I. Over contouring of crown.
- II. Insufficient interproximal clearance, reduction or overcontour
- III. Deficient interproximal contact
- IV. Increased cervico occlusal length of connector
- V. Improper tissue pontic relation---saddle design
- VI. Overextended subgingival positioning of finish line
- VII. Irregular or rough edges of crown that might cause irritation to the gingival tissue
- VIII. Failure of contact ---food impaction
- IX. Ill-fitting crown might cause irritation to gingival tissue
- X. Presence of foreign body irritating soft tissue
- XI. Improper pontic design (continuous food accumulation and soft tissue pressure
- XII. Improper connector design

B) Mechanical problems

- I. ***Looseness of crown or bridge (Cementation Failure), most common cause is***
 - a) Poor retention because of inadequate preparation or faulty preparation (convergence angle, length, surface area ,.....etc.)
 - b) Faulty cementation

The causes of Inadequate cementation might be

 - Poor mixing of cement.
 - Failure to have a dry field.
 - Poor seating
 - Type of cement
 - c) Faulty restoration
 - Open or overhang margin
 - Wear or perforation
 - Deformation of restoration (structural durability)

- d) Premature contact (torque)
- e) Caries
- f) Poor retainer design selection such as ceramic crown in state of fused metal restoration.

II. Mechanical failure of crowns and bridges

a. Porcelain fracture

- Ceramic crown.....
 - Faulty laboratory technique such as improper condensation, inadequate firing, air bubbles, faulty protocol for cad cam crown
 - Faulty preparation
- Porcelain fused to metal.....
 - Faulty technique.....poor coping design
 - Metal framework flexing

b. Distortion or fracture

c. Faulty structural durability of restoration

d. Occlusal wear or perforation

e. Failure of solder joint

III. Restoration Failure

a-Retainer failure;

- Perforation
- Marginal discrepancy
- Veneering separation, fracture or wearing

b- Pontic failure‘

- Pontic fracture (Porcelain) with unfavorable occlusal load
- Limited occlusocervical height due to over eruption

C. Connector failure‘

- Improper designing of connector size and position
- Thin metal at the connector
- Incorrect selection of solder
- Porosity

IV. Marginal deficiencies of restoration

- a) The cause might be
- b) Poor preparation (ill define finish line)
- c) Impression with ill define margin (not clear) of preparation
- d) Technical faults
- e) Cementation errors

V. Fracture of abutment tooth

Over reduction and tooth health state might be the cause

VI. Design failure

- a) Selection of inadequate design
- b) Unstable design

VII. Failure related to esthetic

One of the objectives in replacing a missing tooth is esthetic, definitely failure of this objective leads to failure of bridge. Shape, size, position and shade of restoration collectively play an important role in esthetic value so factors that might cause faulty esthetics are;

- a) *Improper shade selection*
- b) *Poor harmony between restoration and natural teeth (improper contour might be the fault of dentist or lab technician)*
- c) *Failure to mask metal color*
- d) *Un necessary metal display*
- e) *Improper cement selection*
- f) *Irregular and rough surfacediscoloration*

VIII. Discomfort of the patient

- a) Soft tissue irritation by pressure which might be from improper pontic design or food staff accumulation
- b) Deficient interproximal contact that cause food impaction
- c) Traumatic occlusion
 - Faulty construction such as occlusal surface with high marginal ridge or deep incline plan
 - Faulty diagnosis and treatment plan such as
 - Use of teeth that lack of alveolar support
 - Overloading of abutment
 - Premature contact
- d) Retention of food on occlusal surface (poor design)
- e) Poor contouring of the retainer and pontic
 - Overcontour.....overprotection and under stimulation
 - Under contour.....over stimulation and under protection....gingival tissue trauma
- f) Sensitive cervical margin to hot or cold application
 - Long margin that might cause gingival recession
 - Over displacement of gingiva
 - Temporary restoration with long margin cemented for long period of time
 - Retainer with short or open margin
- g) Seating failure
 - Too thick cement
 - Insufficient pressure during cementation

Maintenance Failure

- *Poor oral hygiene and improper maintenance of a well done restoration may lead to failure of prosthesis.*
- *The patient must be fully informed about his responsibility in success or failure of restoration*
- *The dentist must recall the patient for periodic clinical and radiographic examination to detect early any harmful changes that might occur.*