

# Crown and bridge Prosthodontics

## Lecture.2

Prof. Adel F. Ibraheem

### Fixed Partial Denture (Bridge)

#### Purposes (Benefits) of fixed bridge

1. *Correction of any abnormal oral condition*
2. *Restore mastication to full functional efficiency*
3. *Maintain the health of remaining dentition & prevent further injury*
4. *Restore appearance & esthetic*

#### Indications

##### Local:

- 1) *A bridge indicated whenever there are probably distributed healthy teeth that serve as abutments.*
- 2) *Tooth suitable for abutment which require cast restoration (the same tooth lie adjacent to edentulous space & suitable as abutment , bridge may be positively indicated)*
- 3) *Un favorable angulations of the teeth for removable prosthesis , when teeth are badly tilted , then conventional chrome/ cobalt partial denture may be contraindicated*
- 4) *It is advisable to restore edentulous space with fixed rather than removable partial denture*
  - ☒ *F.P.D: force of occlusion transmitted to periodontium, to alveolar bone (natural)*
  - ☒ *R.P.D: force of occlusion transmitted to muco-periostium, to underlying bone (which is not designed this function)*

##### General:

- 1- *Psychological: many patient cannot tolerate R.P.D. because they feel that is not part of them, while F.P.D. is usually rapidly tolerated as part of their natural arch*
- 2- *Systemic: for example epileptic patient ( attack of unconsciousness) positively contraindicated for R.P.D due to fear of fracture inhalation, while F.P.D have adequate strength & retention*
- 3- *Orthodontic consideration : F.P.D indicated for the stabilization of an orthodontic result (e.g.: F.P.D used to replace missing lateral incisor after diastema between two centrals has been closed)*
- 4- *Speech: R.P.D. is bulky, thus may cause further difficulty in speech. While F.P.D size is usually similar to that of the teeth it replace it and rarely cause difficulty in speech*
- 5- *Periodontal reason : when teeth are somewhat mobile , ideal way to achieve stabilization is by construction of fixed splint ( bridge):-*
  - a) *To prevent tooth movement (drifting)*
  - b) *Prevent over extrusion which may lead to loss of bony support*
  - c) *Ensure that the forces of mastication are eventually distributed over several teeth & avoid the overloading on periodontal tissue of the tissue which has been already seriously weakened by disease.*

## **Contraindication**

### **Local:**

- 1- Absence of distal abutment
- 2- if there is considerable loss of bone in visible area of the mouth
- 3- when resistance to lateral movement is needed from contra-lateral teeth & soft tissue
- 4- in cases of long span
- 5- abutment related factor (tooth not suitable as abutment : length, shape, caries, periodontal support)

### **General:**

- 1- Uncooperative patient: difficulty to achieve satisfactory result if the patient uncooperative.
- 2- Social problem: ability of the patient to pay is very important. F.P.D. is more expensive than R.P.D., the patient must be given what he wants, & from what he is given, he can evaluate what he gain.
- 3- Occupation: boxers or hockey players are not advisable to use F.P.D. also pipe smokers (fracture of the bridge and abutments).
- 4- Poor oral hygiene: P.O.H positively contraindicated for F.P.D., P.O.H indicate bad attitude of patient toward dentistry, so it is better to get patient motivation toward oral hygiene before starting F.P.D.
- 5- Age: F.P.D preferable to be done after the age of 17-18 years of age especially to the posterior teeth because:-

☒ Tooth has large pulp.

☒ Teeth not fully erupted.

Also F.P.D. is not indicated for elderly patient when there is lack of resilience in the periodontal membrane or abrasion which increases the size of occluding surfaces.

### **Advantage of bridge:**

- 1) Improve appearance.
- 2) Improve masticatory function.
- 3) Improve speech.
- 4) Occlusal stability.
- 5) Periodontal splinting.
- 6) Restore occlusal vertical dimension.

### **Disadvantage of bridge:**

- 1) Damage to the tooth & pulp.
- 2) Secondary caries.
- 3) Periodontal problem.
- 4) Cost.
- 5) Discomfort.

### **Comparison and advantages of fixed bridges over R.P.D:**

- 1) More stable and comfortable to the patient because it covers tissue surface (there is no acrylic base, flanges or clasps).
- 2) Esthetics better.
- 3) Provide more stable occlusion.
- 4) It has splinting action (while R.P.D push the teeth and cause mobility of teeth).
- 5) Easier to keep clean in the mouth by brushing and dental flossing (There is a point contact between pontic and tissue). While the R.P.D should be removed from the mouth to clean.

- 6) Does not irritate or apply pressure on tissue.
- 7) Psychological patient can tolerate fixed bridge rather than removable one.
- 8) Fixed partial denture is preferred to use in epileptic patient (patient with sudden bouts of unconsciousness fits), patient suffering from Parkinson while the removable P.D. is contraindicated because of fracture and inhalation of the appliance.
- 9) The bulk of R.P.D may induce a difficulty in speech while with the F.P.D the size of pontic is similar to that of the teeth replaced.
- 10) Badly tilted abutment teeth may interfere with the construction of P.D (due to the undercut, lead to food stagnation). A telescopic bridge with metal coping, or fixed movable bridge or proximal half crown can be used.
- 11) F.P.D is more suitable for handi -capped patient.
- 12) Anatomical limitation of R.P.D
  - a. Abnormally large tongue.
  - b. Muscular disorder.
  - c. Mandible tori (torous).
  - d. Palatal surface tissue.

### **CLASSIFICATION OF DENTAL BRIDGES (Types of bridge):**

#### **A. Depending on material used**

1. Cast metal FPD
2. Metal ceramic FPD
3. All ceramic FPD
4. Resin veneered FPD

#### **B. Depending upon location**

1. Anterior FPD
2. Posterior FPD

#### **C. Depending on number of teeth**

1. Two units FPD
2. Three units FPD.

#### **D. Depending upon the tooth reduction**

1. Conventional (Conventional preparation) bridge

*where substantial tooth preparation is necessary for the abutment teeth.*

2. Minimal preparation bridge

*(adhesive, acid etched, resin bonded bridge): such bridge is designed so that to be luted to the unprepared or minimum preparation surface of abutment teeth permanently by acid etching of enamel with some type of resin bonding agent.*

3. Hybrid bridge

*A bridge with a combination of conventional & minimal preparation.*

4. Implant-Supported Fixed Partial Dentures

*It is a bridge that is totally supported to implant fixer ,usually not attached to adjoining natural teeth.:*

- Can not be removed by the patient, only dentist can remove it.
- Can be removed by the patient for cleaning or any other reason.

## 5. Removable bridge

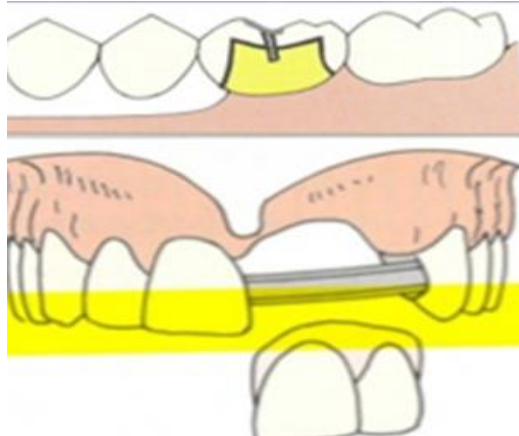
*It is a bridge that is totally supported by the teeth & should not confusing with R.P.D, they either:*

- Cannot be removed by the patient, but can easily remove by dentist

Purpose: to overcome problem a associate with long span FPD

- Can be removed by the patient for cleaning or any other reason .They were developed by Andrew , hence they are known as Andrew s bridge system

Purpose: indicated for edentulous ridges with sever vertical defect.the prosthesis consist of a fixed component & a removable component



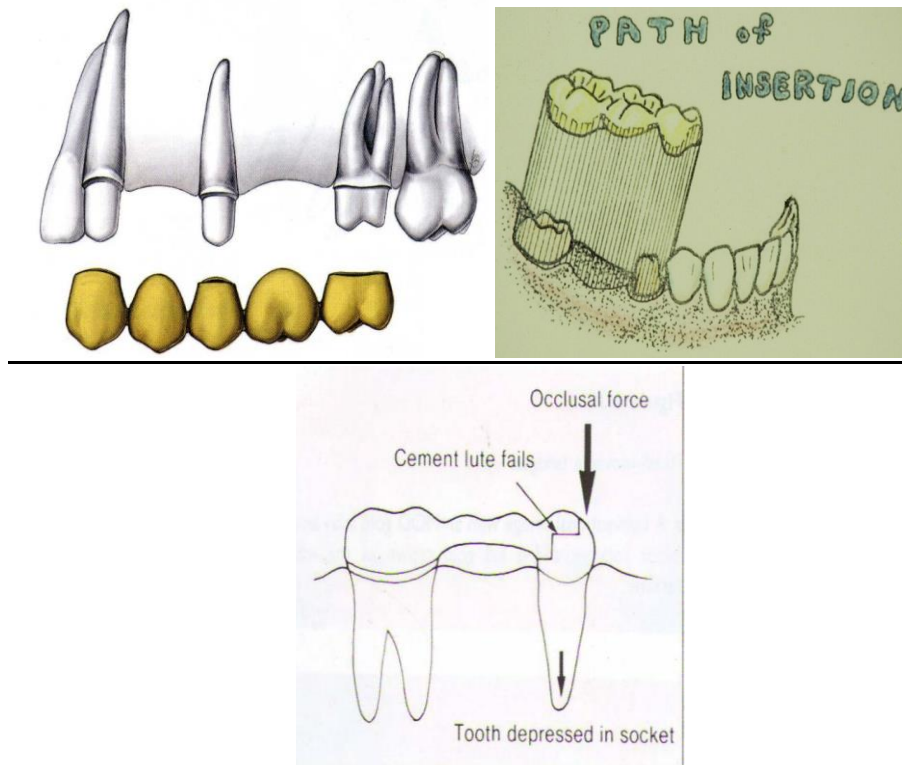
### E. Depending upon the connector (Basic bridge designs)

1. Fixed-fixed bridge
2. Fixed-movable bridge
3. Cantilever bridge
4. Spring Cantilever bridge
5. Compound bridge

### **Basic bridge design (type of bridge according to connector type)**

#### **1. Fixed-fixed bridge:**

- It has rigid connector at both end of the pontic.
- It provides maximum retention & strength.
- It is the most practical design for long span bridge.
- All the retainers in this type are major retainer & require extensive preparation reduction of the abutment.
- Should have one path of insertion (the preparations of both abutments need to be parallel).
- The entire occlusal surface of both abutments should be covered with the retainer (occlusal forces direct on the unprepared area which lead to depress tooth & break connector).
- All the retainers should have approximately the same degree or amount of retention; this to reduce the risk that the force applied will dislodge the weak retainer & leave the bridge suspended).
- More reduction means more destruction of tooth structure & trauma to pulp.
- Abutment teeth are splinted together (adequate in case of mobile teeth).
- This type is cemented as one piece.

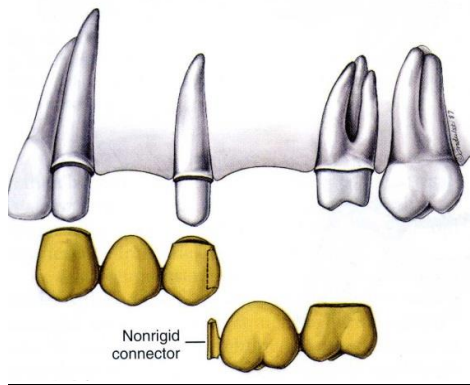


#### **2. Fixed- mobile design:**

- Have rigid connector (major) at the distal end of pontic & mobile (minor) connector mesially.
- More conservative to tooth structure than fixed-fixed design, because minor retainer needs less reduction.
- It allows minor tooth movement (lateral & vertical).
- Limited to one missing tooth (length of span limited).
- Parts of the bridge can be cemented separately.
- Lab. Construction is complex & difficult.

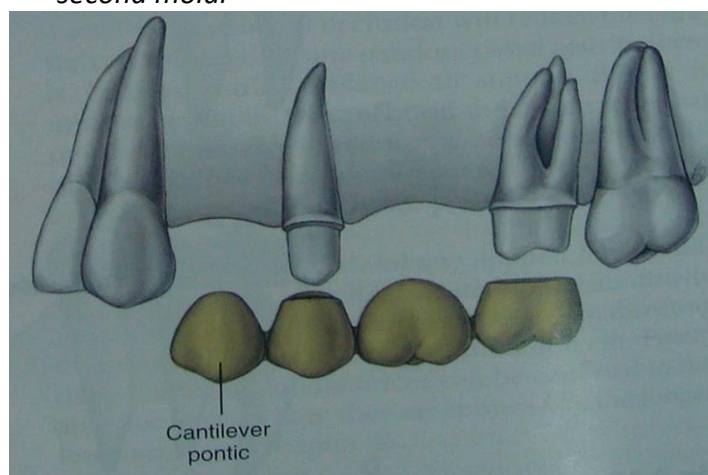


- Preparation of abutment does not need to be parallel.
- It is indicated to be used in:
  1. Divergent abutment teeth (unparallel).
  2. Whenever a pier abutment is present (complex bridge).
  3. For esthetic consideration (class III inlay on distal of canine).



### 3. Simple cantilever:

- It provides support pontic at one end only
- Pontic may attach to one or two retainer
- Abutment tooth either mesial or distal to the span
- It is the most conservative design where one abutment tooth is needed
- Most successful design in replacement of lateral incisor using the canine as abutment when the occlusion is favorable
- The design also can be used to replaced upper or lower first premolar & second molar



#### 4. Spring cantilever

- The pontic attach to a long metal arm run into the palate & terminate with rigid connector on the palatal side of a single retainer on upper 4 or pair 4 & 5
- Abutment usually posterior (tooth need restoration is better to be used)
- The pontic is connected to the retainer by long flexible metal bar (arm)
- Contraindicated in V-shape or due palate & in lower arch
- It is indicated only for replacing missing upper incisor when:
  - The adjacent teeth are sound
  - In cases of midline diastema
  - Spacing of anterior teeth
  - posterior teeth need crown
- Not advice for lower because:
  - Um stability of the sub-mucosal tissue
  - Potential for plaque & calculus deposition



#### 5. Combination designs (Complex or compound bridge)

It is a combination of two or more of the conventional designs incorporated in the general design of bridge, such as:

- Fixed-fixed with simple cantilever.
- Fixed-fixed with fixed mobile.

##### Benefits:

- Should failure occur or repair work needed, only small parts of the whole bridge may have to be disturbed.
- Simplify all the steps of construction.
- Reduce strain on patient by several short visits that are comfortable than two long visit.

