Treatment of furcation involvement

Treatment of advanced forms of periodontal disease frequently includes surgical procedures. The general objectives of these procedures are:

1. To obtain visibility and access to the root surfaces for proper professional debridement.

2. To eliminate the pathologically deepened pockets

3. To establish a morphology in the dento-gingival region which facilitates proper, self-performed tooth cleaning

Objectives of Treatment of furcation involvement

1-The elimination of the microbial plaque from the exposed surfaces of the root complex.

2-The establishment of an anatomy of the affected surfaces that facilitates proper self-performed plaque control.

Degree I

1-Scaling and root planing: Is the removal of hard and soft bacterial deposits from the tooth and root surfaces in order to simplify the self performed plaque control measures.

2-Furcation plasty: It is the therapeutic measure that is preferably used in the treatment of advance degree I & initial degree II involvement. It include the following procedures:

1. Reflection of a mucoperiosteal flap to obtain proper access to the interradicular area.

2. Removal of hard and soft bacterial deposits and inflammatory soft tissue from the furcation area.

3. Odontoplasty: removal of tooth substance in the furcation area in order to widen a narrow entrance of the furca and to reduce the horizontal depth of the involvement.

4. Osteoplasty: recontouring of bony defects in the furcation area.

5. Repositioning and suturing of the flap (Fig 1).

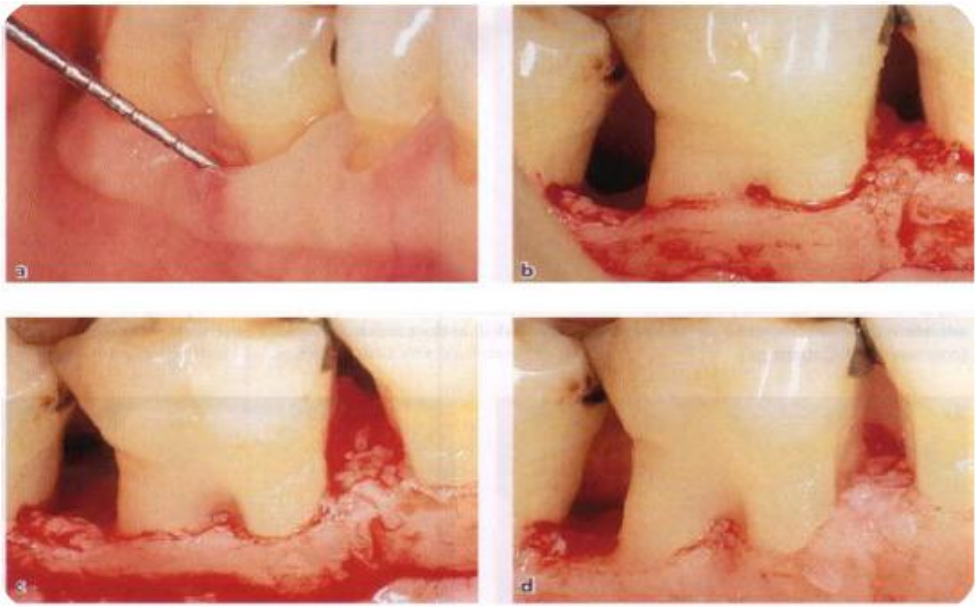


Fig.1

- Aims of furcation plasty:

Is the removal of all the soft and hard materials and then establish a good area for the patient for self performed plaque control measures.

We have some *side effects* in recontoring the tooth by this procedure:

1. Hyper sensitivity of the area

2. Root surface caries

3. More destruction of the periodontal tissue.

Degree II &Degree III

1-Furcation plasty

2- Tunnel preparation (Degree II& III)

3-Root resection& tooth hemisection (Degree II& III)

4-Tooth extraction (Degree II& III)

5-Guided tissue regeneration (Degree II& III)

Notes: scaling and root planing is made in the treatment of any degree of furcation involvement and not only for degree I.

2.Tunnel preparation: used in cases of degree II& mostly degree III furcation involvement. It is a surgical exposure of the entire furcation area. Buccal &lingual mucoperiostial flap is elevated , root surface is scaled & planed ,bone is recontoured . We remove all the infected materials, in the bone, in the bottom of the pocket and on the sides of the roots so we need odontoplasty and osteoplasty then either left exposed or covered by tissue depending on the patient whether maintaining high level of plaque control because of high risk of root caries .This procedure is applied mostly to lower molar bifurcation (has mesial &distal roots) so it provide space for spiral brush to pass freely through the furcation from the buccal to lingual side (Fig2).

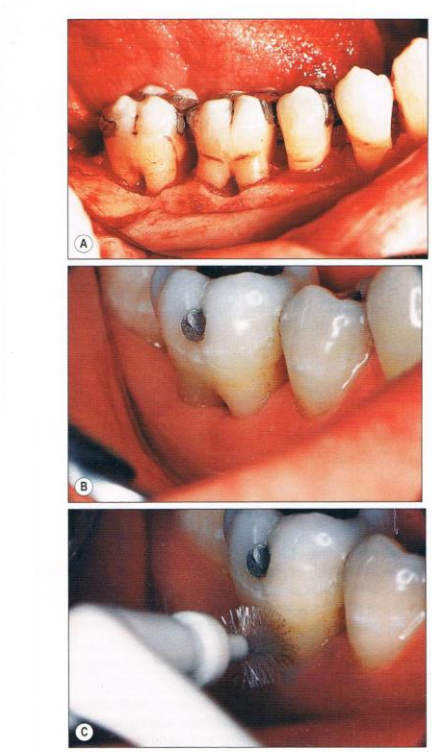


Fig.2

This procedure is more valuable in treatment of lower molars because:

1. Short root trunk

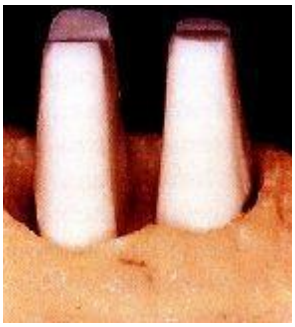
2. Wide separation angle

3. Long divergence between mesial &distal root .

Root resection/Separation , tooth division& hemisection:

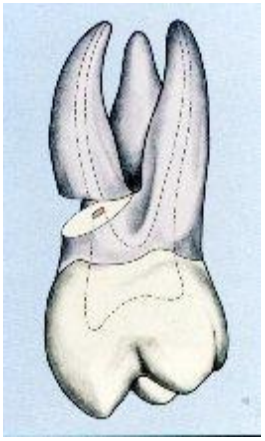
2.Root Separation :

It involves the sectioning of the root complex and the maintenance of all roots.(see the figure below)



3.Root resection :

Is the procedure of choice in cases of deep degree II and III involvement and includes the removal of one or more roots from a multi rooted tooth to allow access to the furcation area for cleaning (Fig3.A). After raising buccal & palatal flaps, sectioning should start in the affected furcation and its path may be planned by passing a blunt probe through the space from buccal to palatal. The cut is made with a tapered diamond bur cooled by sterile water. A wide enough space should be made to elevate the root, taking care not to remove too much substance from the part of the tooth to be retained.



4.Tooth division:

Is indicated for extensive furcation involvement of lower molars where bone loss around both roots is similar. In this procedure ,the tooth is completely divided by extending a cut from the roof of the furcation through the crown after raising a buccal & lingual flaps . Each half of the tooth is reshaped into a single-rooted tooth& will be subsequently prepared to

receive a crown. In this way a two-rooted molar is converted into two single-rooted teeth (Fig3 B).

5.Hemisection (Fig. 3C):

This is indicated for furcation involvement of lower molars where there is extensive bone resorption around one of the roots. It must be ensured that adequate restoration of the remaining half of the crown is possible before embarking on this procedure. A buccal & lingual flaps are raised. The sectioning process is begun at the roof of the furcation , extending upwards to divide the tooth. The remaining root is scaled and planed. The remaining half of the crown is carefully contoured and smoothed and the flaps are repositioned to eliminate any pocketing. After healing the tooth will be crowned usually forming part of the bridge to replace the missing portion.

The risk of leaving “over hangs” of the tooth substance behind during tooth hemisection and root resection is an incitement to carry out these procedures after flap elevation.

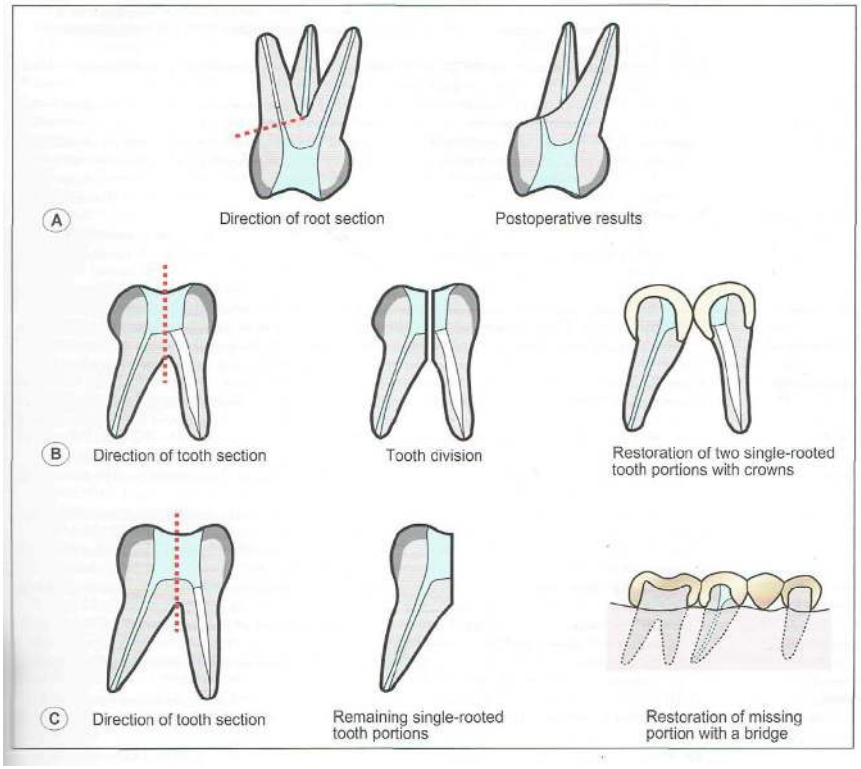


Fig.3 A,B and C

The root resection & hemisection should be proceeded by endodontic treatment for the root that will be retained in the place . A small cavity is made at the entrance of the canal of the root to be removed & packed with amalgam to produce a permanent seal at the point of amputation. Also during endodontic treatment , we may found curved & calcified root that should be scarified) .

- In selection of root to be retained following root seperation, the following factors should be considered:

1. The amount of supporting tissues remaining around the various roots . (we should maintain the root with more bony support).

2. The stability of the individual roots.

3. The root and root canal anatomy with respect to endodontic and restorative treatment procedures (curved, narrow & obliterated root should be sacrificed).

4. The periapical condition of the roots

5. The position of the various teeth (roots) in the alveolar process in relation to adjacent and opposing teeth (to be used as abutment for bridge or other restorative treatments).

6. The oral hygiene of the patient

7. General health of the patient

8. Neighboring teeth should be healthy.

In case where, for example, the furcation of a 1st mand. Molar is involved to extent which calls for root resection, it is usually easy to decide which root is preferable to maintain from the periodontal aspect.

If the amount of the remaining periodontium around the 2 roots is similar, it is often preferable from the endodontic point of view to maintain the distal root because this root has generally only one wide root canal and is therefore easily accessible for endodontic treatment .

Root resection of maxillary 1st premolars is possible only in rare cases due to the anatomy of the tooth.

The furca is often located at the apical level that the maintenance of one root serves no meaningful purpose. In most cases, therefore, a furcation involvement of degree III in maxillary 1st premolar leads to tooth extraction.

In cases of max.molars, when we have furcation involvement calls for root resection, we can preserve the 2 buccal roots (MB, DB) or the palatal root with one of these 2 roots , the decision depend on the previously discussed factors. We cannot maintain the palatal root only because of its relation to the neighboring & opposing teeth (cannot be used as abutment).

6.Tooth extraction:

The indications f or extractions are:

1. When the destruction of the periodontium has progressed to such a level that no root can be preserved.

2. When the maintenance of the affected tooth will not improve the overall treatment.

3. When treatment of furcation involved tooth will not result in condition which can be properly maintained by self performed plaque control measures.

Failures in furcation therapy could be due to:-

1. Inadequate plaque control.

2. Poor root resection technique.

3. Im proper restorations.

4. Endodontic failures.

5. Cracked roots.

6. Root caries.

The best prognosis of furcation involvement treatments is obtained from the root resection& hemisection while the least prognosis is the tunnel preparation because the patient cannot remove the plaque completely from the central part of the furca so we will end with pulp involvement.

