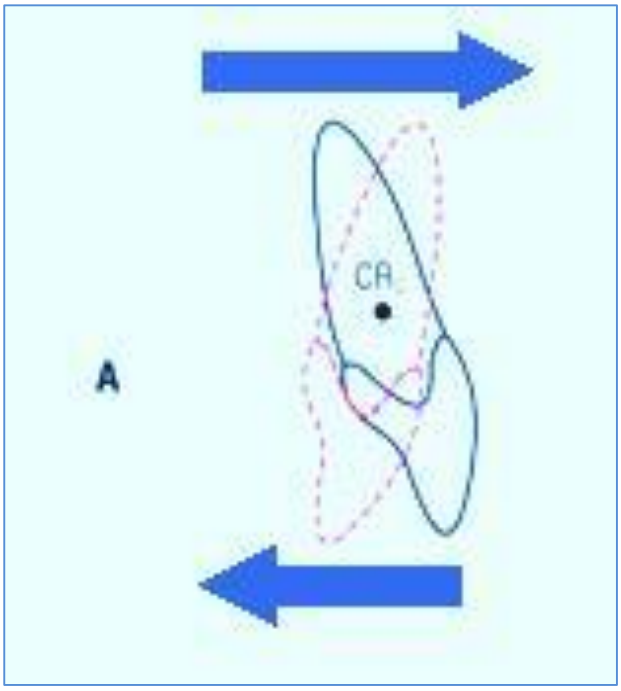
Orthodontics

Types of orthodontic tooth movement

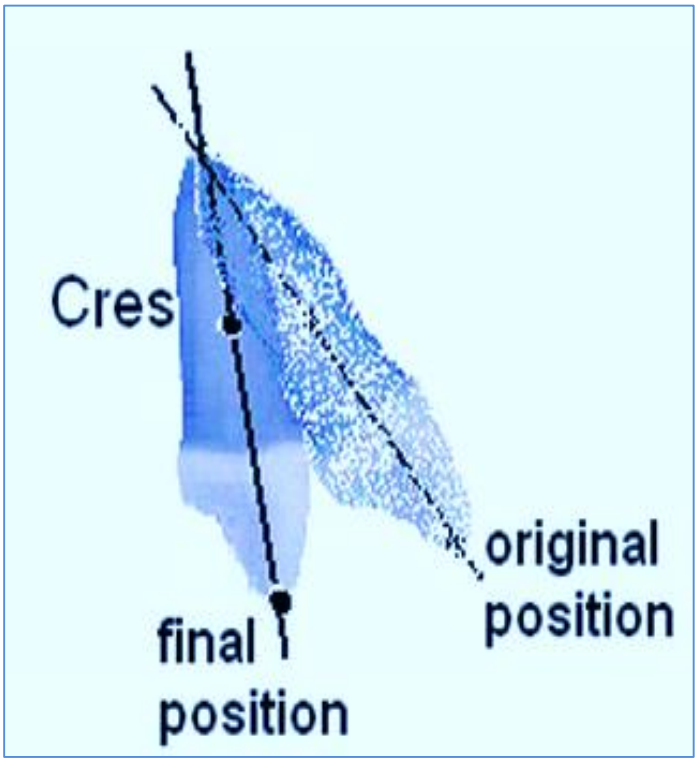
Types of orthodontic tooth movement:

1. Tipping movement could be:

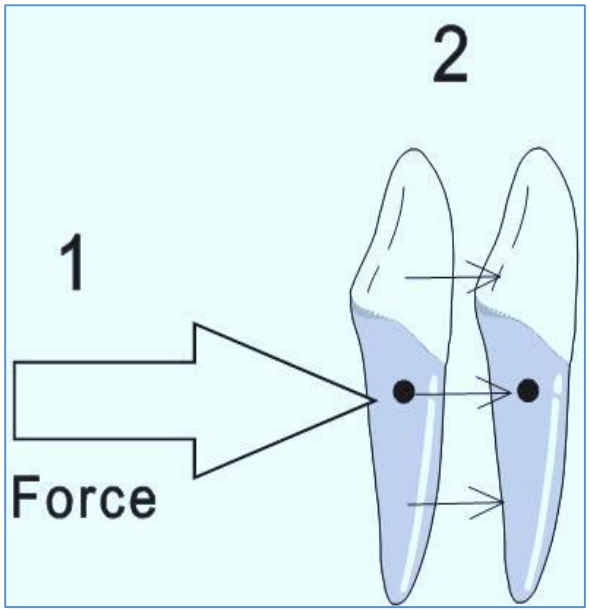
A. Uncontrolled tipping: typically shown in the tooth tilts around a fulcrum situated about one-third the distance coronal to the root apex. Pressure sites are created at the root apex and cervix, It result in movement of the root apex and the crown in opposite directions [the crown moves in the same direction of the force while the root apex in the opposite direction]. This movement is often undesirable except when we want to change the inclination of a tooth "within a certain limit"; e.g. retroclination of already proclined mesially inclined canines, etc.



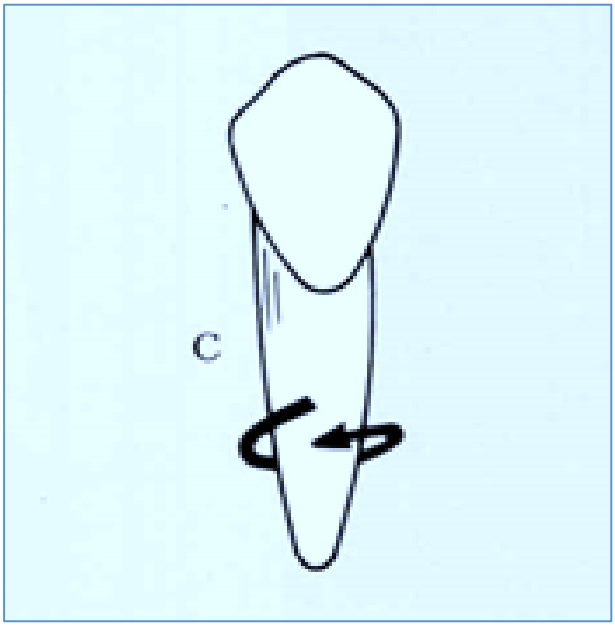
B. Controlled tipping: Here the pressure at the root apex is minimal while concentrated at the cervical area. It is often desirable since the fulcrum lies approximately at the root apex leading to major crown movement with very minor root apex movement, so it is indicated when abnormal inclination of a tooth is due to the crown more than the root.



2. Translation or Bodily Movement: Here the applied force is spread over the whole of the root surface in the direction of movement; it implies equal movement of the crown and root in the same direction without a change in the inclination of 'the tooth; e.g. retraction of normally inclined incisors or canine distalization.



3. Rotation: Pure rotation is achieved by the application of what is called "couple force system"; i.e. applying 2 equal but opposite force that results in circular movement of the tooth around is long axis. Here the fulcrum [center of rotation] will be situated at the center of resistance of the tooth. Rotational movements have great tendency to relapse after or the treatment due to the "re-coil" action of the PDL fibers.



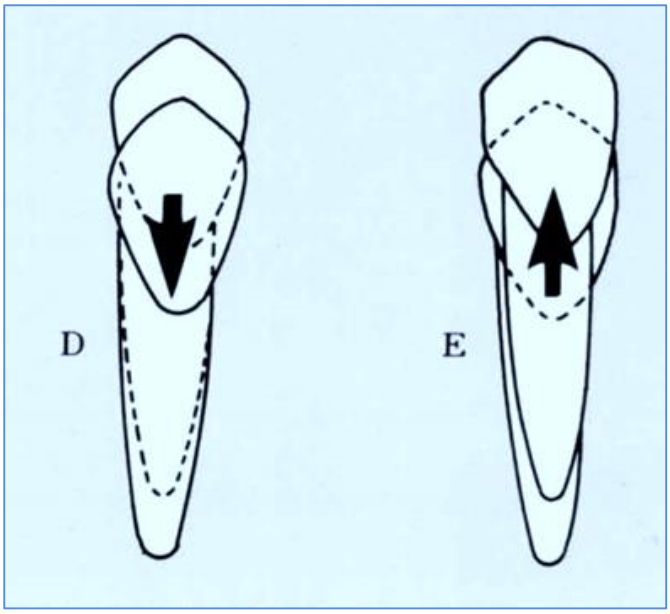
The followings can be done to minimize this relapse:

- Prolonged retention.
- Over correction [over rotation].'"
- Precision detachment.

4. Vertical movement. Could be:

A. Extrusion: A translational type of tooth movement parallel to the long axis of the tooth in the direction of the occlusal plane (resembles tooth eruption); e.g. closures of anterior open bite by extrusion of upper and/or lower anterior teeth.

B. Intrusion: The same definition of extrusion but in an apical direction; e.g. intrusion of upper and/or lower teeth to reduce a deep bite.



5. Root torque and uprighting: It means major movement of the root with minimal crown movement [i.e. opposite to

controlled tipping]. Torqueing means palatal or lingual root movement, while reverse torqueing means buccal-'or labial root movement. Mesial or distal root movement is called root uprighting.

An example for torque movement is the correction of maxillary centrals root inclination in class II div. II malocclusion.

Notes:

- All of the above mentioned tooth movements can be achieved by the fixed appliance, while removable

appliance can only do uncontrolled tipping and rotation of less than 90~.

- All of the above mentioned tooth movements belong generally to 3 basic types; bodily, pure rotation and a combination of translation and rotation.