

## **CROWDING**

Crowding affects approximately 60% of Caucasians. Both jaw size and tooth size are mainly genetically determined and appear to be reducing; however, environmental factors, for example premature deciduous tooth loss, can increase crowding. In evolutionary terms both jaw size and tooth size appear to be reducing. However, crowding is much more prevalent in modern populations than it was in prehistoric times. This may be due to the introduction of a less abrasive diet, so that less interproximal tooth wear occurs during the lifetime of an individual. Also, a change from a rural to an urban life-style can also apparently lead to an increase in crowding after about two generations.

### **CLASSIFICATION OF CROWDING:**

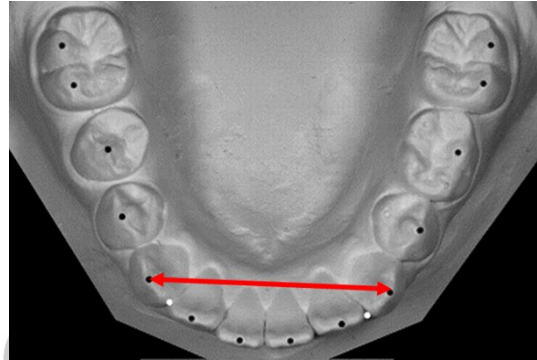
Considering the amount of space deficiency, crowding is divided into:

- Mild crowding (0-4mm)
- Moderate crowding (5-8mm)
- Severe crowding (>8mm)

Considering its etiology, crowding is divided into:

- Primary crowding (hereditary): crowding is determined genetically and is caused by disproportionately sized teeth and jaws. The malalignment of the anterior teeth is characteristic of this type of crowding.
- Secondary crowding: it is an acquired anomaly caused by mesial drift of the posterior teeth after premature loss of deciduous teeth in the lateral segments.
- Tertiary crowding: occurs between the ages of 18 and 20 primarily of the lower anterior teeth. It may be attributed to:
  - ❖ mesial migration of the posterior teeth owing to forces from the erupting third molars. The third molar has a weak association with late lower incisor crowding. Furthermore, this crowding can still occur in patients with congenitally absent third molars. Therefore, prophylactic removal of lower third molars to prevent lower labial segment crowding cannot be justified.
  - ❖ uprightening of the lower incisors as a result of forward growth of the mandible when maxillary growth has slowed.

- ❖ soft tissue pressures being stronger from the lips and cheeks than from the tongue.
- ❖ reduction in lower intercanine width:  
In most individuals intercanine width increases up to around 12 to 13 years of age, and this is followed by a very gradual diminution throughout adult life. The rate of decrease is most noticeable during the mid to late teens.



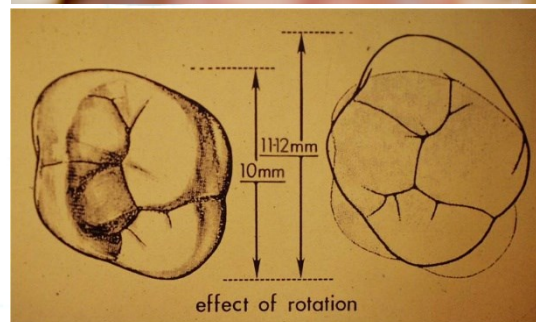
## **METHODS OF SPACE CREATION**

The amount of space that will be created during treatment can also be assessed. The aim is to balance the space required with the space created. Space can be created by one or more of the following:

### **1- Derotation**

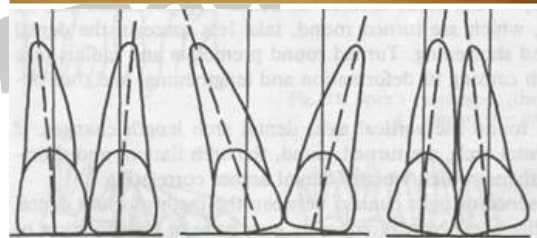
Derotating anterior teeth needs space because rotated incisors take up less space than aligned ones.

While, derotating posterior teeth creates space because rotated molars take up more space than aligned ones.



### **2- Uprighting**

Uprighting tilted teeth creates space because mesially or distally tipped teeth take up more space than upright ones.



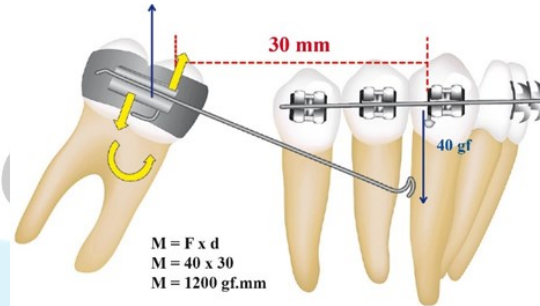
### **3- Distal movement of molars**

Distal movement of molars in the upper arch can be achieved with headgear. Extra-oral traction using headgear will usually produce up to 2–3 mm per side (creating 4–6 mm space in total). It is used:

- when there is a mild space requirement where extractions may produce too much space
- in addition to extractions when there is a very high space requirement.

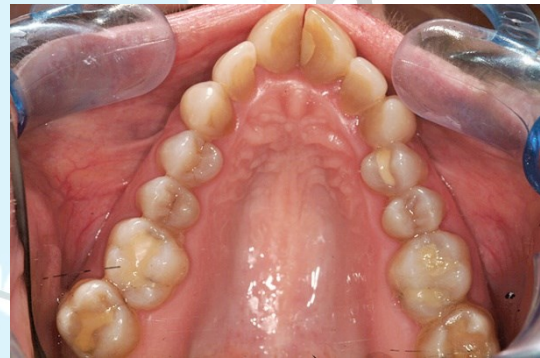
Temporary anchorage devices (TADS) offer an alternative to headgear. Appliances attached to these anchorage devices can be used to distalize upper molars.

Distal movement of the lower first molar is very difficult and in reality the best that can be achieved is uprighting mesially tipped molars.



#### 4- Expansion

Space can be created by expanding the upper arch laterally; approximately 0.5 mm is created for every 1 mm of posterior arch expansion. Expansion should ideally only be undertaken when there is a crossbite. Expansion without a crossbite may increase the risk of instability and the risk of perforation of the buccal plate.



Expansion of the lower arch may be indicated if a lingual crossbite (scissors bite) of the lower premolars and/or molars exists. Any significant expansion in the lower arch, particularly the lower intercanine width, is unstable.

#### 5- Proclination of incisors

Space can be created by proclining incisors, but this will be dictated by the aims of the treatment, so proclining upper incisors in Class III malocclusion and lower incisors in Class II malocclusion can help correct the incisor relationship and relief crowding at the same time. Each millimetre of incisor advancement creates approximately 2mm of space within the dental arch.



#### 6- Enamel stripping

Enamel interproximal reduction or 'stripping' is the removal of a small amount of enamel on the mesial and distal aspect of teeth. In addition to

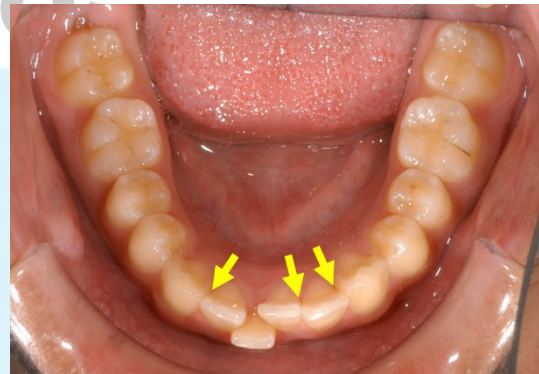


creating space, the process can improve the shape and contact points of teeth, and possibly enhance stability at the end of treatment.

On the anterior teeth approximately 0.5mm can be removed on each tooth (0.25mm mesial and distal) without compromising the health of the teeth. Enamel can be carefully removed with an abrasive strip, then treated topically with fluoride.

A high-speed air-turbine handpiece can be used to remove enamel from the posterior teeth. However, both teeth and periodontium can be damaged unless care is taken. Removal of filling materials is preferred over sound enamel when applicable.

It is important that teeth are reasonably aligned before enamel reduction begins.



### **7- Extractions**

Before planning extractions of any permanent teeth, it is essential to ensure that all remaining teeth are present and developing appropriately.