DENTAL FACTORS AFFECTING DEVELOPMENT OF OCCLUSION

The third major factor affecting the development of the occlusion of the teeth is the relationship between the size of the dentition and the size of the jaws which have to accommodate the teeth. Ideally, there should be adequate space for the teeth to erupt into the mouth without crowding or overlap; slight spacing is usually accepted as satisfactory.

In the primary dentition, actual overlapping of the teeth is unusual, and a disproportion between jaw size and tooth size is usually manifested as a lack of spacing rather than as actual crowding.

CROWDING

About 60% of the population had actual or potential crowding of the permanent dentition.

Possible causes are:

- There is evidence for the independent genetic control of tooth size and jaw size, and this may in part explain the high prevalence of crowding of the teeth.
- There is an evolutionary trend towards a diminution in size of the jaws without a corresponding diminution in tooth dimensions.
- The present-day populations represent a mixture of peoples from various ethnic backgrounds, and such interbreeding of people with different physical characteristics leads to skeletal and dental disharmonies.
- Modern diet is soft and may provide less stimulus to jaw growth than the more primitive diets. *Questionable*. Dental arch crowding is not, however, only a feature of modern populations. Indeed, skulls from the 6th century AD exhibited crowding and irregularity.

Anglo Saxon jaws from the 6th century AD, showing crowding and irregularity of the teeth.

Orthodontic consideration

Disproportion in size between the jaws and the teeth is a feature of many dentitions, but the main problems affecting occlusal development in this respect appear when the dentition is too large for the jaws; a dentition too small for the jaws is only rarely a problem in orthodontic practice.

Skeletal relationship and muscular factors can produce a dental arch which is larger or smaller than the arch of the basal bone, thus reducing or increasing the effects of excessive dentition size.

The effects of excessive dentition size

1. Overlapping and displacement of teeth.
2. Impaction of teeth.
3. Space closure after extractions.

1. Overlapping and displacement of teeth

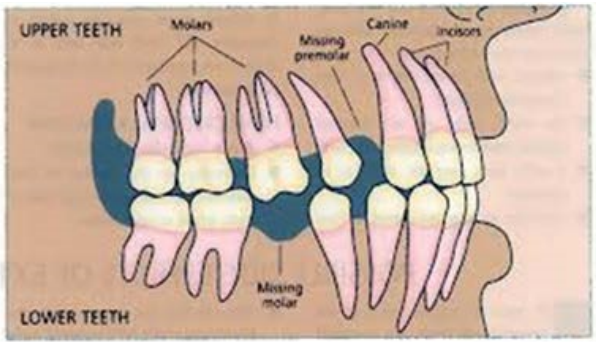
Teeth erupting into the arch tend to become displaced by teeth already in the arch. This particularly affects the last teeth to erupt in any group, i.e. the lateral incisors, second premolars, canines and third molars.

2. Impaction of teeth

Impaction of teeth occurs when eruption is completely blocked by other teeth due to crowding or may be other factors. Again, it tends to affect the last teeth to erupt in each segment.

3. Space closure after extractions

Spontaneous space closure could occur after extraction of teeth. In the primary dentition space closure occurred less in the incisor region than in the molar region, and more in the upper arch than in the lower. The most important factor in governing the amount and rate of space closure was the degree of crowding of the dental arch.



It is fairly generally accepted that space closure is dependent mainly on the relationship between dental arch size and dentition size. If the dentition is small in relation to the dental arch little or no space closure will occur as a result of loss of teeth. It is also generally accepted that space closure after extractions in a crowded or potentially crowded dental arch occurs from both sides of the extraction space, the mesial movement usually exceeds the distal movement, perhaps by a factor of two to one.

The effects of early loss of primary teeth

The presence of the primary dentition is essential for normal growth of the jaws, for normal function and eventually for normal position and occlusion of the permanent teeth; and therefore, the premature loss of a primary tooth is to be avoided if at all possible.

The effects of the premature loss of primary teeth are:

1. Function and oral health.
2. Over-eruption of opposing teeth.
3. Psychological effects on child and parent.
4. Position of permanent teeth.

1. Effects on function and oral health

Early loss of primary teeth may affect masticatory function. Additionally, there may be slight effects on speech following loss of anterior primary teeth.

It has also been claimed that the loss of certain primary teeth, particularly the first molars, reduces the incidence of dental caries in the remaining teeth.

1. Over-eruption of opposing teeth

Excessive eruption of the opposing tooth, or excessive vertical dentoalveolar development, frequently occurs. This can be seen following loss of primary teeth, but on the whole this effect is transient.

1. Psychological effects on child and parent

The loss of anterior primary teeth alters the appearance of the child, which in some cases may produce undesirable psychological effects.
(*Sequences*)

4. Effects on the position of permanent teeth

(a) When there is ample space in the dental arch no crowding of the permanent teeth is likely occur.

(b) When there is just enough space for the successional teeth to erupt without crowding the loss of even a small amount of space by movement of teeth into an extraction space will result in crowding of the permanent teeth.

(c) When there is slight crowding potential in the dental arch for the successional teeth an increase in the crowding potential is encountered. (Extraction of permanent teeth)

(d) When there is severe crowding potential in the dental arch for the successional teeth a consequent aggravation of the crowding potential is likely occurred.

The effects of asymmetric loss of primary teeth

The resultant distal movement of teeth anterior to the extraction space can lead to an asymmetry of the dental arch, with deviation of the centre midline, which can be difficult to treat. (Symmetrical extraction)