

# Aetiology of malocclusion- Introduction

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## Overview

- **Skeletal problems**
  - Antero-posterior
  - Vertical
  - Transverse
- **Crowding**
  - Genetic Influences
  - Environmental influences

## Introduction

- The aetiology of malocclusion is often the result of several interacting factors.
- These are principally **genetic and environmental**, although the precise role of inherited factors is not fully understood.
- **Craniofacial dimensions** and both **size and number** of teeth are largely determined genetically
- **Dental arch dimensions** are influenced more by environmental factors.
- Specific congenital defects with a genetic basis, which involve the maxilla or mandible, are rare, as is malocclusion caused primarily by trauma or pathology.

## Skeletal problems- anteroposterior

- The majority are caused by inherited jaw proportions, which are strongly genetically determined.
- Class II malocclusion-**mandibular deficiency**
  - Moderate: Inherited for almost all cases
  - Severe cases: environmental soft tissue influences as well
- Class III malocclusion,
  - **Mandibular prognathism** has a strong racial and familial tendency
  - Mandibular posturing, possibly caused by tongue or pharyngeal size, may stimulate growth and influence jaw size secondarily.
  - **Maxillary deficiency** is also most likely due to inherited jaw dimensions and a simple environmental factor seems unlikely, but its exact aetiology is almost completely unidentified.

## Skeletal problems-Vertical

- Vertical jaw proportions are also **inherited**
- **Soft tissue postural effects** (e.g. anterior tongue position or mandibular postural changes induced by partial nasal obstruction) may contribute in particular to anterior open bite.
- Other **environmental influences**, such as a high **lower lip line**, may contribute to deep overbite.

## Skeletal problems-Transverse

- Skeletal crossbite often has a **genetic** origin
- A unilateral crossbite with displacement is often caused by a **functional alteration**

## Crowding-Genetic influences

- Crowding is the most common orthodontic problem
- Caused in part by a reduction in jaw and tooth size over the centuries.
- Interpopulation breeding has also been implied as arch width is influenced by jaw size, which is under tight genetic control.

## Crowding-Environmental influences

- Early loss of primary teeth due to caries or trauma
- Digit-sucking habit
- Softer, less abrasive modern diet
  - Less interproximal tooth wear
  - Less demands on jaw function
  - General tendency for smaller jaw size
- Soft tissue pressure of sufficient duration (more than 6 hours per day) in combination with the developmental tooth position may be responsible for a localised crossbite or malalignment.