

# ORTHODONTICS

## Etiology of orthodontic anomalies

MUDr. Alena Bryšová, Ph.D.



# ORTHODONTICS

Stomatological specialisation dealing with prevention, diagnostics and therapy of irregular tooth position, relationship of tooth arches and jawbones



# Etiology of orthodontic anomalies

- Ideal set of teeth can be seen in aprox. 25% of population
- 40% need treatment



# Etiology of orthodontic anomalies

- Ideal occlusion



# Etiology of orthodontic anomalies

- Malocclusion is a manifestation of genetic and environmental interaction on the development of orofacial region



# Etiology of orthodontic anomalies

- The etiological factors:

1. genetic influences
2. prenatal factors
3. postnatal, environmental influences



# Etiology of orthodontic anomalies

- 1. genetic influences:

Heredity is supposed to be of the polygenic type. A feature is determined by a certain number of minor genes. The influence of the parents genes may be combined. If the same or a similar feature is found in the parents, disposition to heredity is assumed.



# Etiology of orthodontic anomalies

- Hereditary are mainly:
  - Shape and size of tooth
  - Teeth number
  - Shape and size of jawbones
  - Time of teeth eruption
  - Time and type growing jawbones





# Etiology of orthodontic anomalies

- Mainly hereditary anomalies:
  - True mandibular progenia
  - Skeletal open bite
  - Skeletal deep bite
  - Primary crowding
  - Skeletal class II and III
  - Hypodontia, hyperodontia
  - Deep bite with retrusion of incisors
  - Retention or impaction of teeth
  - clefts



# Etiology of orthodontic anomalies

Mainly hereditary anomalies- mandibular prognatism  
in the Hapsburg family



# Etiology of orthodontic anomalies

Mainly hereditary anomalies – skeletal class III



# Etiology of orthodontic anomalies



# Etiology of orthodontic anomalies

Mainly hereditary anomalies – skeletal deep bite



# Etiology of orthodontic anomalies

- Mainly hereditary anomalies- skeletal open bite



# Etiology of orthodontic anomalies

Mainly hereditary anomalies – primary crowding



# Etiology of orthodontic anomalies

- Mainly hereditary anomalies- hypodontia





# Etiology of orthodontic anomalies

Mainly hereditary anomalies- hyperodontia



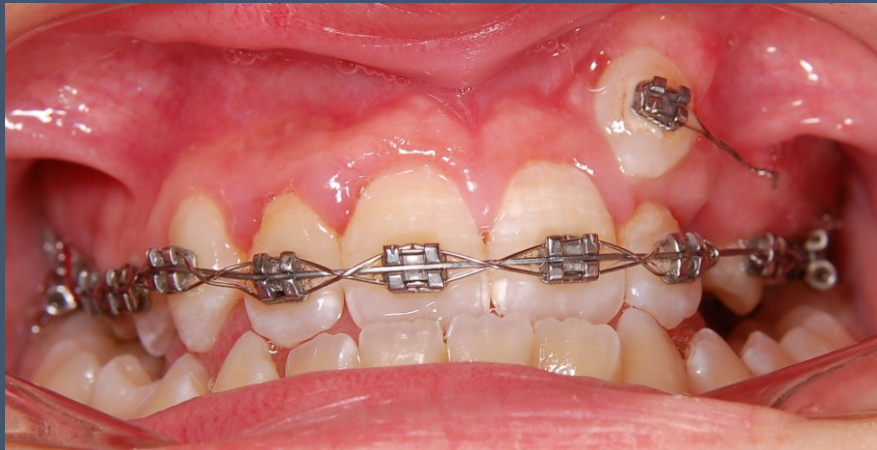
# Etiology of orthodontic anomalies

hyperodontia



# Etiology of orthodontic anomalies

ektopic canine



# Etiology of orthodontic anomalies

- 2. Prenatal factors

- A.- teratogens

- influence of physical, chemical and infectionals effects during gravidity- if acting in critical time



# Etiology of orthodontic anomalies

- A.- teratogens affecting dentofacial development

## Teratogens

## Effect

Aspirin, Valium

cleft lip and palate

Cigarette smoke[hypoxia]

cleft lip and palate

Cytomegalovirus

microcephaly, hydrocephaly

Ethyl alcohol

central mid-face deficiency

6-Mercaptopurin

cleft palate

Rubella virus

microftalmia, cataracts

Thalidomide

hemifacial microsomia

Toxoplasma

microcephaly, Hydrocephaly

X-radiation

microcephaly

Vitamin D excess

premature suture closure



# Etiology of orthodontic anomalies

- Anomalie -Developmental defects - amelogenesis



# Etiology of orthodontic anomalies

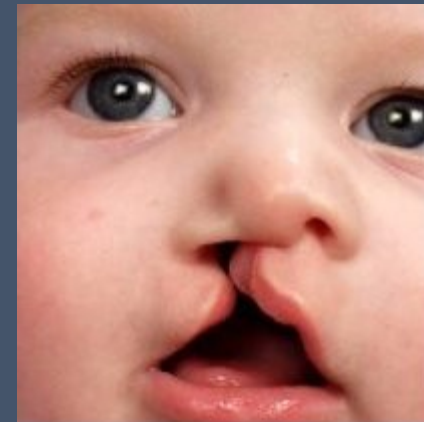
- 2. Prenatal factors

- B - Syndromes of the first and second branchial arches include symmetric and asymmetric congenital malformations of the eyes, ears, mid-face region, jaws and teeth combined with extreme defects on the soft tissue, mastication muscles - mandibular dysostosis, hemifacial microsomia, clefts
  - Synostosis syndromes – result from premature closure of the sutures between the cranial and facial bones in the later foetal developmental period



# Etiology of orthodontic anomalies

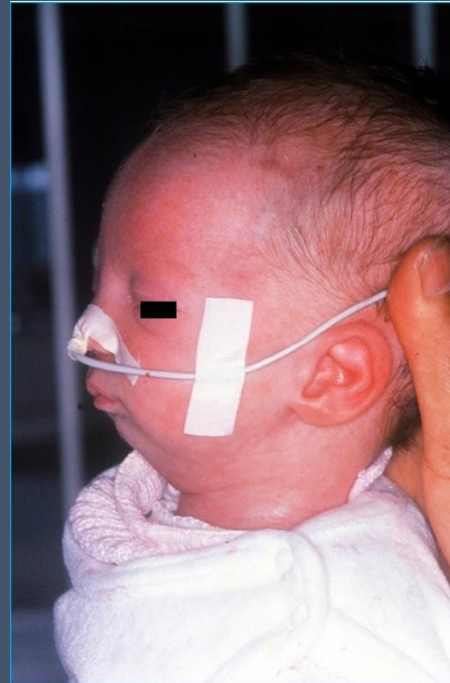
- Clefts lip and palt





# Etiology of orthodontic anomalies

Syndromes – Pierre Robin syndrome



# Etiology of orthodontic anomalies

- 3. Postnatal influences

- Type of initial nourishment – breast-feeding[suckling] or bottle-feeding
- Bad habits – sucking of finger, thumb,, biting of lips, cheeks. They may unfavourably influence position of teeth and the shape of alveolar ridges.
- Breathing through the mouth cause by chronic inflammation of the nasal mucosa associated with allergies or chronic infection tonsils and adenoids



# Etiology of orthodontic anomalies

- 3. Postnatal influences

- masticatory function – anthropological studies indicate that changes in dental occlusion and an increase in malocclusion occur along with transition from a primitive to a modern diet and lifestyle. Malocclusion can be labelled as a „disease of civilisation“
- Premature loss of deciduous teeth as same as permanent teeth, due to dental caries, injury, or their agenesis may lead to formation of anomalous shifts and inclinations of the other teeth, lack of place for the teeth and the crowding in the dentition



# Etiology of orthodontic anomalies

- 3. Postnatal influences

- Trauma – undiagnosed fractures of the mandibular condyles can cause disorders of the growth of the mandibular ramus =asymmetry
- Hormonal disorders – growth hormone deficiency, thyroid hormone deficiency – can contribute to the origin of acquired anomalies



# Etiology of orthodontic anomalies

Postnatal influences – bad habits-sucking of fingers



# Etiology of orthodontic anomalies

- Postnatal influences – trauma – fracture of the mandibular condyle



# Thank You for Your attention

Questions – email – [alena.brysova@fnusa.cz](mailto:alena.brysova@fnusa.cz)

Consultation – Orthodontic department - St. Anne's Hospital, building D2b – Thursday 1-2 p.m.

