Operative techniques in Dentistry: Paedodontics and Orthodontics

- The purpose of orthodontics
- Grouping of the appliances
- Elements of fixed appliances
- The types and parts of the removable appliances
The purpose of orthodontic treatments

To solve esthetic complaints
To treat the functional anomalies (chewing, speech, TMI, etc.)
Prevention (caries, parodontitis, TMJ dysfunction)
Angle Classification

- Class I Molar (65%)
- Class II Molar (30%)
- Class III Molar (5%)
Sagittal anomalies - Angle classification
(based on: anteroposterior relationship of the jaws)

Angle I. neutralocclusion
Angle II. distocclusion
Angle III. mesiocclusion
I. class

Angle I. osztály

Class I Molar

Distal

Mesial
Angle I.

Crowding, narrowing, lack of place

Diasthema medianum

Open bite

Impacted wisdom teeth
Angle II. - Distocclusion

The mandible is backward or/and the maxilla is forward.
Functional jaw orthopaedics, bimaxillary, functional appliances
Functional jaw orthopaedics, bimaxillary, functional appliances

- Restructuring of TMJ
- Restructuring of dentoalveolar area
- New muscle balance
Construction bite - set of anteroposterior and vertical relationship between the upper and lower jaw.
Bimaxillary appliances - Functional jaw orthopaedics

AKTIVATOR
Set of vertical relationship
Grinding of appliance
Fixed appliances for the treatment of II. class anomalies

- Herbst-appliance
- Jusper Jumper
- Forsus spring stb.
CLASS II MALOCCLUSION

FUNCTIONAL APPLIANCES

PERMANENT DENTITION
CLASS II DIVISION 1

HERBST APPLIANCE (FIXED)
MANDIBLE HELD IN
PROTRUSION +
OPEN VERTICALLY
CLASS II MALOCCLUSION
FUNCTIONAL APPLIANCES

FIXED HERBST APPLIANCE
II. Class rubbers
Angle III – progenie - mesiocclusion
Orthodontic treatment in primary dentition

• Progenia
• 1. appliance: chin cap

• 2. Inclined plane
• (against frontal crossbite)
Headger and fixed appliance

If the maxilla is responsible for the anomaly and in mild distalocclusion:
Distalisation of upper molars
Prohibition of growing of upper jaw
Extraction of upper premolars (compromised treatment)
Extraction by sagittal anomalies

Compensation of sagittal anomalies

• medium degree Angle II

• low degree Angle III cases
Extraction of upper premolars

Compensation of the skeletal anomalies

Reasons:
1. Sagittal anomaly, overjet, protrusion stb.

Anchorage: Microvis implant
Extraction of upper premolars

Reasons:
Sagittal anomaly, overjet, protrusion stb. (compensation of the skeletal anomaly)
2. Upper crowding, ectopic canine etc.
Extraction of upper premolars

Reasons:
Sagittal anomaly, overjet, protrusion stb. (compensation of the skeletal anomaly)
2. Upper crowding, ectopic canine etc.
3. Anchorage: transpalatinal bar
Extraction of upper premolars

Compensation of the skeletal anomaly

Reasons:
1. Sagittal anomaly, overjet, protrusion etc.
Face profile !!!

Child aged 10 and 12; extractions and fixed braces

Bird face

Retrognath face
CLASS II MALOCCLUSION
EXTRACTION
Intermaxillary anchorage

EXTRACTION OF
UPPER FIRST PREMOLARS +
LOWER SECOND PREMOLARS
Surgical solutions
Műtéti előkészítés
Angle III – progenie - mesiocclusion
Orthodontic treatment in primary dentition

- Progenia
  - 1. appliance: chin cap
  - 2. Inclined plane
    - (against frontal crossbite)
Real progeny - surgery

Aligned dentures

the sizes of the arches are fit to each other

Dr Nemes Bálint esete
Protocoll in III. class cases

• Hyrax

and

• Reverse headger
Protocoll in class III. cases

If the maxilla is responsible for the anomaly (micrognathia, retrognathia f.e. after the surgical closure of cleft palate)

PROTRACTION of the maxilla
HYRAK + FACE MASK (DENTAL + SKELETAL)
Premolar extractions

III.class

Assimmetric anomaly
Extraction of lower permanent incisors

Bimaxillary protrusion with lower crowding, I. class

2 upper premolars and 1 lower incisor are extracted
Angle III – progenie - mesiocclusion
Elements of fixed appliances
Direkt bonding system
(multibond, multibracket appliance)
Components of the Appliance

- Rigid connectors, called molar tubes and brackets
- Archwires, and other elastic sources of force
- Auxiliaries (Everything else needed to get the job done.)

Dot is always on the disto-gingival wing of the bracket
Metalbrackets

- Stainless steel brackets
- Titanbrackets
- Gold brackets
Ceramic brackets
Ceramic brackets

- Disadvantages:
  - expensive
  - fragile
  - difficult to remove the brackets
  - more difficult to apply ligatures

Advantages:
- esthetic
Ligatures

Elastic ligatures (rubbers)  Metal ligatures
Elastic chain (for space closer)
Placing Orthodontic Bands

- Three major steps in banding:
  - separation of adjacent teeth
  - sizing and fitting the band to the tooth
  - cementation and cleanup
Placing Orthodontic Bands

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Placing Orthodontic Bands

- Three major steps in banding:
  - separation of adjacent teeth
  - sizing and fitting the band to the tooth
  - cementation and cleanup
Direct bonding tubes
Headgear
Anchorage
Distalisation of molars
Treatment of vertical anomalies
Fixed expanders – Quad-helix
Fixed expanders – Transpalatal bar
Fixed expanders - Hyrax
Hyrax

Indication:
- serious narrowing of the upper arch
- bilateral or unilateral cross bite
- treatment of cleft palate (scar-tissue enlargement)
- hyrax has a skeletal affect (childhood, puberty, 8-14 ages)
- Expansion in serious II. and III. class cases

Hyrax is used in mixed and permanent dentition, while children are growing.
After the end of the development hyrax can’t be used (alone)

Affect:
- ripping („breaking”) of the sutura palatina mediana
Case I

narrowing, lack of place
Case I

Gap between the central incisors shows the correct result (shows the skeletal affect)
Hyrax – permanent dentition

Structure in permanent dentition:
- Metal bands on teeth 14, 16, 24, 26, 6 or 12 mm expanding screw
Hyrax – mixed dentition

Structure in mixed dentition:
- Acrylic splint on the lateral teeth (canines, primary molars)

6 or 12 mm expanding screw
Fixed expanders - Hyrax

Dystractor

Hibrid-hyrax
SARME = Surgically assisted rapid maxillary expansion, dystractios osteogenesis
Transversal problems
Active acrylic plates (in mixed dentition)
REMOVABLE APPLIANCES: ACTIVE AND PASSIVE PLATES

mainly in mixed dentition
The grouping of the plates

- Upper passive plate
- Upper typical active plate with a screw and inclined plane
- Upper atypical active plate with a screw and occlusal biteraiser
- Lower typical active plate with a screw
- Lower Y-plate
- Lower atypical active plate with a screw
Grouping the plates

**Passive**

Upper passive (retention) plate

**Active**

Upper typical active plate with a screw and inclined plane
The elements of the plates
Upper passiv (retention) plates

- Acryl basic plate
- Labial bow
- Clasps
- Active elements
The elements of the plates
Lower passiv (retention) plate

Acryl basic plate
Labial bow
Clasps
Active elements
The elements of the plates

- Acryl basic plate
- Labial bow
- Clasps
- Active elements
The elements of the plates

Acryl basic plate
Labial bow
Clasps
Active elements

Adams clasp

Adams clasp
The elements of the plates

- Acryl basic plate
- Labial bow
- Clasps
- Active elements

Arrow clasp
The elements of the plates

- Acryl basic plate
- Labial bow
- Clasps
- Active elements-springs

Free-ended or finger springs

closing
opening
The elements of the plates

Acryl basic plate
Labial bow
Clasps
Active elements

• console-like springs
Active plates
The screws
Activ plates

- Upper typical (symmetrical) activ plate
- Lower typical (symmetrical) activ plate
Activ plates

Upper atypical active plate

Lower atypical active plate with
Active plates
Y-plate

Upper Y-plate

Lower Y-plate
Active plates

Upper atypical active plate with a screw and occlusal biteraiser
(lateral crossbite)
The elements of the plates
Bite raising plane

thick acrylate behind the upper incisors
intrusion of lower incisors
Surgical solution in adulthood

(after 18y.)

LeFort I.

Dystractor)
Vertical anomalies

Deepbite
(skeletal or dentoalveolar ?)

Open bite
dentoalveolar ?)
Bite raising plane
(on the upper appliance)
Fig. 11. Corrected incisor relationship, bilateral open bites.
Bimaxillary, functional appliances

Frankel- appliance
Anti Spee (curve) wires
Open bite

- Consequences of thumb sucking
  - Open bite
  - Protrusion of upper incisors
  - Retrusion of lower incisors
  - Distalocclusion
Habit breakers
Keserű anyagok ujjszopás ellen
INTERCEPTIVE ORTHODONTICS

*Local factors: THUMB SUCKING*

- At what age should treatment be started?
  - Da Silva et al (1991) “from the 5th year of age”
  - Proffit (1993) “before the eruption of permanent incisors”
  - Houston (1993) “by 7-8 years of age”
  - Larsson (1987) “before pubertal growth spurt”
Appliances against bad habits
DEGLUTITIO INFANTILIS

Tongue thrust swallow
5- Intermaxillary rubbers, miniimplant
Bite closure
• Hereditary skeletal open bite: surgery !!!
Thank you for your attention!
Primary teeth extractions
Basic Space Maintainers

- **NANCE** (Transpalatal Arch with Acrylic Button Stop on Palate)
- **LOWER LINGUAL HOLDING ARCH** (LLHA)
- **BAND/CROWN** and **LOOP**
- **DISTAL SHOE**
NANCE (Transpalatal Arch with Acrylic Button Stop on Palate)
BAND/CROWN and LOOP
BAND/CROWN and LOOP
BAND/CROWN and LOOP
- Omega Loops in area of premolars allow slight adjustment to fit appliance.
LOWER LINGUAL HOLDING ARCH (LLHA)

- Mandibular incisors often erupt lingually and are pushed forward by the tongue or lingual arch
Transzpalatal bar
Distal Shoe

• Before the eruption of the first molar
Distal Shoe
Removable space maintener

Passive

Active
Early loss of the primary canines (never extract primary canines, because you will lose the place of the permanent canine)
Hotz serial extractions

- primary canines
- primary first molars
- permanent first premolars
Possibilities by missing teeth

- Reimplantation (after accidents)
- Bridge
- Implantation
- Space closure with fixed orthodontic appliance
- Preprosthetic orthodontic treatment + prosthetic solution
Correction of the abutment tooth
Indication of preprosthetic orthodontic treatment

• Correction of the tooth axis
• Space opening for bridge or implantatum
• Treatment of crossbite
• Alignment of impacted teeth
• Treatment of the consequences of parodontopathia
Pillérfogak tengelykorrekciónja

Correction of the axis of the abutment tooth.
Correction of the axis of the abutment tooth
Indication of preprosthetic orthodontic treatment

- Correction of the tooth axis
- **Space opening for bridge or implantatum**
- Treatment of crossbite
- Alignment of impacted teeth
- Treatment of the consequences of parodontopathia
Preprosthetic orthodontic treatment, opening the space

Space opening with fixed appliance

Case 3
Case 3
Preprosthetic orthodontic treatment, opening the space
Case 3

Preprosthetic orthodontic treatment, opening the space
Case 4

Preprosthetic orthodontic treatment, opening the space
Preprosthetic orthodontic treatment, opening the space

Case 4
Preprosthetic orthodontic treatment, opening the space

Case 4
Case 5, loss of 21

Preprosthetic orthodontic treatment, opening the space + implantatum
Preprosthetic orthodontic treatment, opening the space + implantatum of 21
Preprosthetic orthodontic treatment, opening the space + implantatum

Case 5, loss of 21
Preprosthetic orthodontic treatment, opening the space + implantatum

Case 5, loss of 21
Preprosthetic orthodontic treatment, opening the space + implantatum

Case 5, loss of 21
Case 5, loss of 21
Preprosthetic orthodontic treatment, opening the space + implant.
Preprosthetic orthodontic treatment, opening the space + implantation

Case 5, loss of 21
Preprosthetic orthodontic treatment, opening the space

Case 6
Preprosthetic orthodontic treatment, opening the space

Case 6
Preprosthetic orthodontic treatment, opening the space

Case 6
Indication of preprosthetic orthodontic treatment

- Correction of the tooth axis
- Space opening for bridge or implantatum
- Treatment of crossbite
- Alignment of impacted teeth
- Treatment of the consequences of parodontopathia
Metszőfogak keresztharapásának kezelése

Preprosthetic orthodontic treatment, crossbite
Preprosthetic orthodontic treatment, crossbite
Indication of preprosthetic orthodontic treatment

- Correction of the tooth axis
- Space opening for bridge or implantatum
- Treatment of crossbite
- **Alignment of impacted teeth**
- Treatment of the consequences of parodontopathia
Alignment of impacted teeth Case 7
Alignment of impacted teeth

Case 7
Alignment of impacted teeth + bridge
Case 7
Alignment of impacted teeth 28
Case 8
Alignment of impacted teeth 28

Case 8
Alignment of impacted teeth 28
Alignment of impacted teeth 28

Case 8
Alignment of impacted teeth 28

Case 8
Alignment of impacted teeth 28 + bridge Case 8
Alignment of impacted teeth 28

Case 8
Indication of preprosthetic orthodontic treatment

- Correction of the tooth axis
- Space opening for bridge or implantatum
- Treatment of crossbite
- Alignment of impacted teeth
- Treatment of the consequences of parodontopathia
Treatment of parodontopathia
Treatment of parodontopathy
Grouping of the orthodontic appliances

Removable appliances

Fixed appliances
Grouping the appliances

Intraoral appliances

Extraoral appliances

Extra-, intraoral appliances
Chin cap – against progenie, (extraoral)
Headgear
(intra-extraoral)
Anchorage
Distalisation of molars
Treatment of vertical anomalies
Reverse Headger Facemask (intra-extraoral)
Indirect bonding
Indirekt bonding
Removing Fixed Appliances

- Bands are lifted off the tooth with band removing pliers
- Metal brackets are easily removed by gently squeezing them with How pliers
- Ceramic brackets must be removed with great care to avoid enamel fracture.
- Residual cement and adhesive is removed with a scaler or metal finishing bur. or rubbers
Quad-helix
Hyrax
Fixed appliances for the treatment of II. class anomalies

- Herbst-appliance
- Jusper Jumper
- Forsus spring stb.
Orthodontic Implants
Anchorage
Orthodontic Implants
Anchorage
Four premolars extraction

Permanent Dentition

Class II Subdivision Right

Moderate Overjet
Four premolars extraction

UPPER ARCH

LOWER ARCH
Four premolars extraction

POST-TREATMENT
Two upper premolars extraction

The canine has to be always in correct position!!
One lower incisor extraction
Extraction of wisdom tooth

Orthodontic indication
Oral screen
Inclined plane
Retention

• There is only one way to completely avoid relapse. At the end of treatment, remove the braces, polish the teeth, make study models and take photographs. And then take the patient out the back door of the office and shoot him. (Dr. Tom Graber DMD, South African Dental Congress. August 1992.)
Retention

- Treatment with fixed appliance: 1-3
- The length of retention should be twice longer than the activ treatment

1 év > 2 év
Retainers

gyári retainer

vékony acélív

sodort ív
Retainers
Retainers - Essix retainer
Retainers - Positioner
Retainers - Barrer-retainer
• Treatment with fixed appliance: 1-3 (4-5) years

• The length of retention is twice longer than the activ treatment

1 év > 2 év