Extraction in Orthodontics
Extraction of primary teeth

Extraction of dens neonatalis, dens connatalis

Treatment of early loss of primary teeth (orthodontists try to avoid the extractions of primary teeth)

Persisting primary teeth

Hotz serial extractions
Extraction of dens neonatalis
Treatment of early extractions in primary and/or mixed dentition

• We have to treat the consequences of early extractions of primary molars and canines
• Space maintainers have to be used
First primary molar extraction – space maintainers
metal band on the second primary molar + wire
First primary molar extraction – space maintainers

metal crown (on the second primary molar) + wire

-Metal crown is correct treatment of the decayed second primary molar and Keeps the space maintener
Distal Shoe

space maintainers

Second primary molar extraction – metal band or crown (on the first primary molar) + wire + distal shoe
Upper second primary molar extraction – Nance appliance

Space maintainers
Extractions of premolars – lingual arch

Space maintainers

-- Lingual arch should not be placed with primary incisors
Lower second primary molar extraction – lingual arch with omega loop

- Omega Loops in area of premolars allow slight adjustment to fit appliance
Permanent premolars are smaller than the primary molars. Space maintainers prohibit the mesialisation of the permanent first molar and Leeway space can be used for the treatment of the frontal crowding or ectopic canine etc.
Systematic Extractions – by Hotz

when

- There’s no place enough for the permanent teeth
- Crowding, narrowing (zk.10mm)
  and
- There’s no skeletal problem
- Angle I. (sagittal relationship)
Steps of serial extractions

1. 53, 63, 73, 83 extraktion (primary canines)
   Alignment of permanent incisors
2. 54, 64, 74, extraktion (primary first molars)
3. 14, 24, 34, 44 extrakcion (primary first premolars)

Permanent canines erupt in the place of the premolars

- The crowding can be solved without orthodontic appliances
Normal relationship of the incisors

- Physiologic Diastema
Supernumerary teeth always have to be extracted
Reasons of orthodontic extractions

- Extractions by crowding, narrowing, lack of place
- Extractions for the compensation of sagittal anomalies
- Extractions by protruded incisors
Extraction in Orthodontics

Extraction of permanent teeth

- Extraction of upper incisors
- Extraction of canines
- Premolar
- Molar extraction
- Wisdom tooth extractions
- Assymmetric extractions
Extraktions of upper incisors
There’s no orthodontic indication of permanent incisors’ extractions, but ......

- Morphological deviations of the crowns, trauma, fractura (Radix 2/3), dilatation
- Unilateral aplasia of lateral incisors (mainly by peg shape lateral incisor)
Variability of the upper lateral incisors (often assymmetrical)

Peg shape

Extraction?
Dissection of a double tooth and extraction of the half tooth
Extraction of canines

- Orthodontists always try to avoid the extraction of the impacted canines
- Sometimes the position of the canine is so unfavourable that the extraction is avoidless
Extraction of premolars

- The most frequently extracted teeth in orthodontics are the premolars.
- Mostly the first premolars are extracted.
- The second premolar is extracted if the first premolar is healthy and the second one is decayed, filled etc.,
- By II. class anomalies upper first premolars and lower second premolars are extracted (if we can not avoid extraction because of crowding or bimaxillary protrusion)
TREATMENT OF GENERAL ANOMALIES

Crowding

- Mild crowding
- Moderate crowding
- Severe crowding

Extraction
Ectopic lower premolar
Crowding

I. class

4 premolar extractions
Extraction of 4 premolars

I. Class

First premolars are extracted
4 premolars extraction

II. Class, 4 premolars extraction

Upper first molars and lower second molars
II. Class, 4 premolars extraction

Upper first premolars and lower second premolars
II. Class, 4 premolars extraction

Upper first premolars and lower second premolars
CLASS II MALOCCLUSION
EXTRACTION OF FOUR PREMOLARS
DIFFERENTIAL ANCHORAGE

PRE-TREATMENT

SLIGHTLY CONVEX
SOME LIP PROTRUSION
CLASS II MALOCCLUSION
EXTRACTION
DIFFERENTIAL ANCHORAGE

II. Class, 4 premolars extraction
Upper first molars and lower second molars

PERMANENT DENTITION
CLASS II SUBDIVISION RIGHT
MODERATE OVERJET
BIMAXILLARY PROTRUSION !!!
CLASS II MALOCCLUSION
EXTRACTION
DIFFERENTIAL ANCHORAGE

MILD CROWDING
BIMAXILLARY PROTRUSION !!!
CLASS II MALOCCLUSION EXTRACITION
DIFFERENTIAL ANCHORAGE

EXTRACTION OF
UPPER FIRST PREMOLARS +
LOWER SECOND PREMOLARS
CLASS II MALOCCLUSION
EXTRACTION OF UPPER FIRST AND LOWER SECOND PREMOLARS
DIFFERENTIAL ANCHORAGE

POST-TREATMENT
CLASS II MALOCCLUSION
EXTRACTION
DIFFERENTIAL ANCHORAGE

POST-TREATMENT
CLASS II MALOCCLUSION
EXTRACTION
DIFFERENTIAL ANCHORAGE

UPPER ARCH

LOWER ARCH
Arch perimeter analysis (place analysis)

- We have to compare the calculated place (width of the teeth) and the measured place
Steiner analysis – place analysis

Calculated value = Width of 3,4,5 Width of 2,1,1,2 Width of 3,4,5

<table>
<thead>
<tr>
<th></th>
<th>543</th>
<th>21</th>
<th>12</th>
<th>345</th>
</tr>
</thead>
<tbody>
<tr>
<td>Measured value</td>
<td>22</td>
<td>11</td>
<td>9.5</td>
<td>20</td>
</tr>
<tr>
<td>Measured value</td>
<td>24</td>
<td>12</td>
<td>11.5</td>
<td>23</td>
</tr>
<tr>
<td>Difference</td>
<td>-2</td>
<td>-1</td>
<td>-2</td>
<td>-3</td>
</tr>
<tr>
<td>Sum of differences</td>
<td>-3</td>
<td>-5</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
**PONT’S ANALYSIS**

- Pont’s in 1909 presented a system whereby mere measurement of Incisors automatically gives width of the arch in premolar & molar region
Pont-index

Procedure

The greatest width of incisors is measured with calipers recorded on a line, & their sums when recorded in millimeters this is termed as "sum of incisors" (SI)
Calculated premolar value (CPV)
The expected arch width in the premolar region is calculated by formula:
\[
\frac{SI \times 100}{80}
\]

Calculated molar value (MV)
The expected arch width in the molar region is calculated by:
\[
\frac{SI \times 100}{64}
\]
Pont-Index

- If the difference between the optimal premolar, molar distance and the measured premolar, molar distance is less then 5 mm EXPANSION

- If the difference between the optimal premolar, molar distance and the measured premolar, molar distance is more then 8 mm EXTRACTION

- Between 5-8 mm BORDERLINE CASE
Extraction by sagittal anomalies

Compensation of sagittal anomalies

• medium degree Angle II

• low degree Angle III cases
Extraction of upper premolars

Reasons:
1. Sagittal anomaly, overjet, protrusion stb. (compensation of the skeletal anomaly)

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.
Extraction of upper premolars

Reasons:
Sagittal anomaly, overjet, protrusion stb.
(compensation of the skeletal anomaly)
2. Upper crowding, ectopic canine etc.
Face profile !!!

Child aged 10 and 12; extractions and fixed braces

Bird face

Retrognath face
Extraction of lower permanent incisors
Extraction of lower permanent incisors
Extraction of lower permanent incisors
Bimaxillary protrusion with lower crowding, I. class

2 upper premolars and 1 lower incisor are extracted
II. class
Crowded and protruded lower incisors and
Extraction of 2 upper premolar and 1 lower incisor
Mild III. class, lower crowding

Compensation of the skeletal anomaly
Extraction of lower permanent incisors, **advantages**

- It’s easier sometimes to remove 1 incisor than 2 or 4 premolars
- It doesn’t influence the profile
- The occlusion doesn’t change in the molar and premolar area
- Shorter treatment time
- Less tooth movement
Extraction of lower permanent incisors, disadvantages

- Midline shifting
- The occlusion is not always perfect
- Dark triangles interdentally
Which lower incisor...?

- The central incisor is smaller and weaker
- Most labially positioned
- Injured or treated tooth
Indication of asymmetric extraction

- Extraction of lower incisors
- Sometimes asymmetric anomalies are solved with asymmetric extractions

Avoid it!
Balancing extraction
Balancing extraction
Balancing extraction
Balancing extraction
Timing of first molar’s extraction (10 – 12 years)
(reason: gangrena, periostitis, periodontitis etc.)

There’s no orthodontic indication of first molar extraction
Extraction of upper second molar and distalisation of the first molar with headger

- The role of upper second molar extraction in orthodontic treatment *1: A case report
  T. M. Graber D.D.S., M.S.D., Ph.D.* Kenilworth, Ill., USA

Available online 10 June 2004

Treatment of second class anomalies

**Second molar extraction in orthodontic treatment**
American Journal of Orthodontics, Volume 72, Issue 6, December 1977, Pages 599-616
David W. Liddle
Extraktion of wisdom tooth

- Wisdom tooth can cause:
  - Relapse after orthodontic treatment
  - Tercier crowding
  - Pain, pressure
  - Pericoronitis
  - Bad oral hygiene (difficult to clean)
Extraktion of wisdom tooth

Wisdom tooth can cause:
Pericoronitis
Relapse after orthodontic treatment
Tercier crowding
Pain, pressure
Pericoronitis
Bad oral hygiene (difficult to clean)
Extraktion of wisdom tooth

Caries
Extraktion of wisdom tooth

Orthodontic indication

Wisdom tooth can cause:

- Relapse after orthodontic treatment
- Tercier crowding
Are the wisdom teeth responsible for the relapse?

The wisdom teeth are often responsible for the relapse, but without (or after the extraction of) third molars relapse might be also evolved.

- Lifshitz, AB. An evaluation of the mandibular third molar influence on the arch length and postretention crowding [Master thesis]. University of Iowa, 1982
Thank you!
MOYERS MIXED DENTITION ANALYSIS

The purpose of a mixed dentition analysis is to evaluate the amount of space available in the arch for the erupting permanent canines and premolars. In this analysis the size of the unerupted permanent cuspids and premolars are predicted from the knowledge of the sizes of certain permanent teeth that are already erupted in the mouth.
The moyers analysis predicts the combined mesio-distal width of 3, 4, 5 based on the sum of the widths of the four lower permanent incisors.

The mesio-distal width of the four lower incisor are measured and summed up. The amount of space available for the 3, 4 and 5 after incisor alignment is determined by measuring the distance between the distal surface of lateral incisor and the mesial surface of first permanent molar.
### Moyers-Index

- **Total mandibular incisor width**

<table>
<thead>
<tr>
<th>Width</th>
<th>Moyers-Index Width</th>
</tr>
</thead>
<tbody>
<tr>
<td>19.5</td>
<td>20.6, 20.1</td>
</tr>
<tr>
<td>20.0</td>
<td>20.9, 20.4</td>
</tr>
<tr>
<td>20.5</td>
<td>21.2, 20.7</td>
</tr>
<tr>
<td>21.0</td>
<td>21.3, 21.0</td>
</tr>
<tr>
<td>21.5</td>
<td>21.8, 21.3</td>
</tr>
<tr>
<td>22.0</td>
<td>22.0, 21.6</td>
</tr>
<tr>
<td>22.5</td>
<td>22.3, 21.9</td>
</tr>
<tr>
<td>23.0</td>
<td>22.6, 22.2</td>
</tr>
<tr>
<td>23.5</td>
<td>22.9, 22.5</td>
</tr>
<tr>
<td>24.0</td>
<td>23.1, 22.8</td>
</tr>
</tbody>
</table>
Early extraktion

- 26 mesialisation
- 16 mesialisation and
- 55 in secundaer Infraocclusion