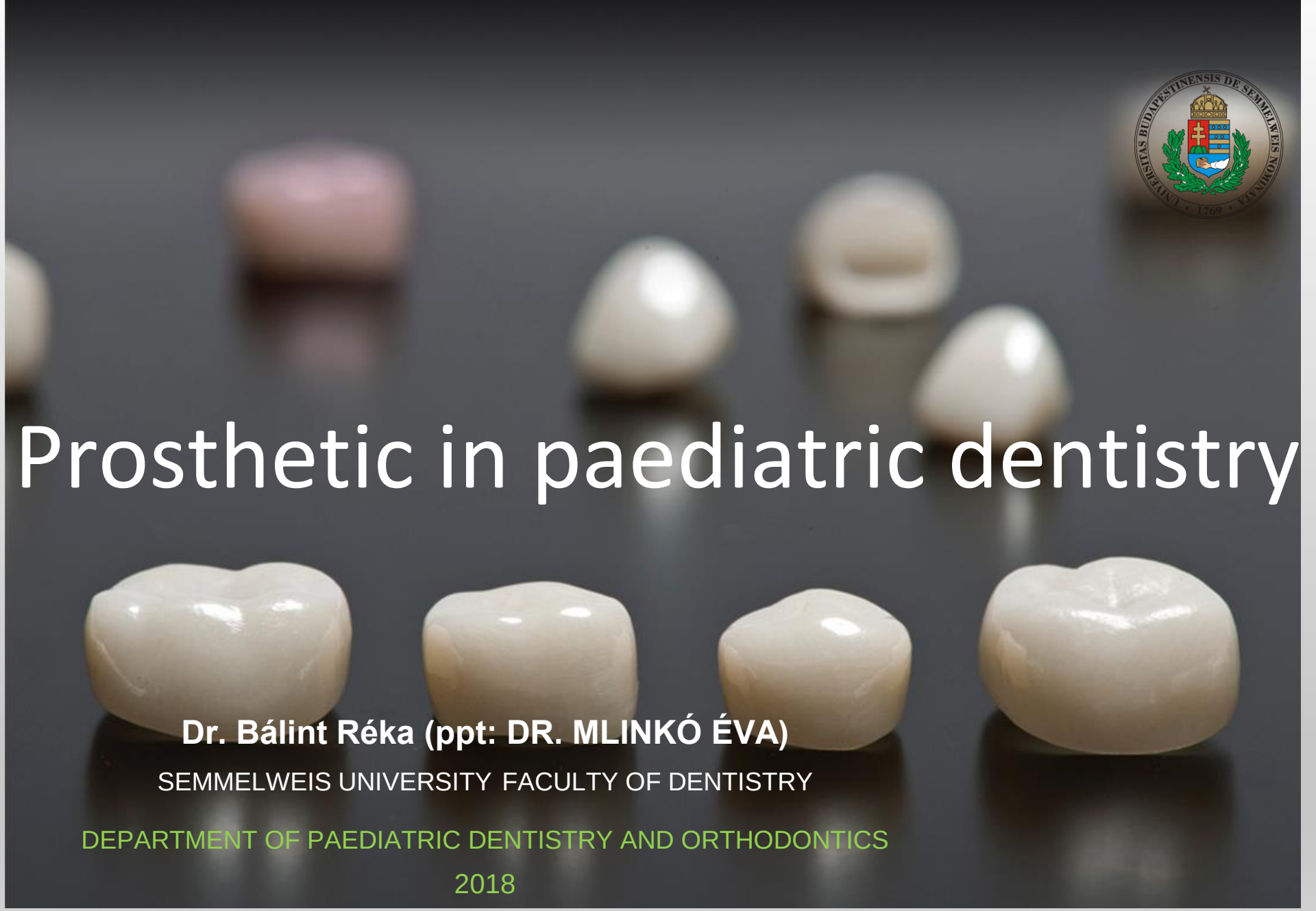

Prosthetic in paediatric dentistry

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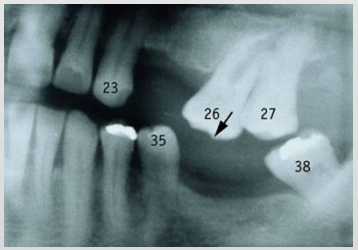
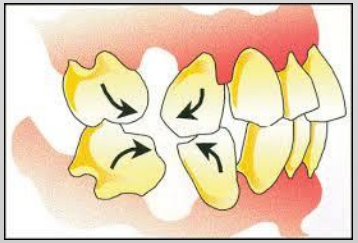
DEPARTMENT OF PAEDIATRIC DENTISTRY AND ORTHODONTICS

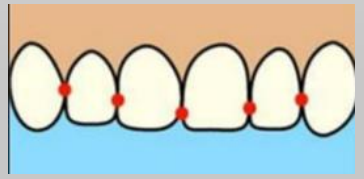
2018

Aim of the prosthodontic treatment in childhood

- To restore the destroyed teeth and supply missing teeth
- Losing one tooth?
  - Elongation of the antagonist tooth
  - Tilting of the adjacent teeth
  - Contact point system gets unbalanced
- Missing primary teeth have consequences in permanent dentition
- The aim in the primary dentition: space maintaining
- The aim in young permanent dentition: deal time
  - To make adequate circumstances for later restauration







Fábián G, Gábris K, Tarján I Gyermekfogászat Fogszabályozás és Állcsontortopédia Semmelweis Kiadó Budapest 2013
www.nature.com/articles/4800787
http://www.medeco.de/en/dentistry-and-oral-medicine/fixed-prosthodontics/bridges/

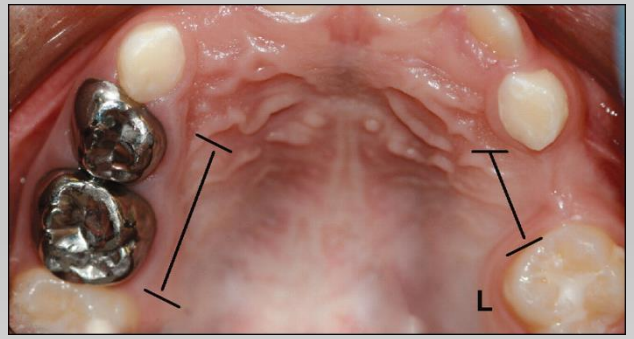
The etiology of tooth loss

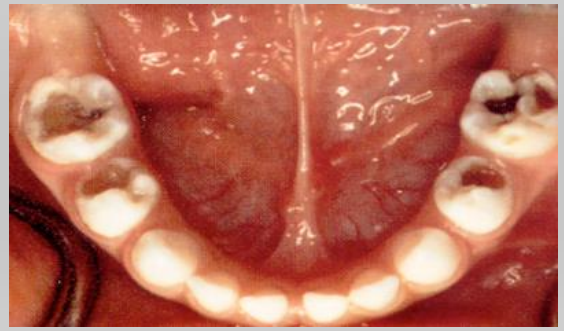
- **Caries**
  - Inadequate mouth hygiene caries extraction
  - early primary tooth extraction crowding in the permanent dentition
- **Accident**
  - more risk in Angle II/1
  - Fractura/ Luxatio partialis complications extraction
  - Avulsio
    - Primary dentition - never reponate
    - Permanent dentition – reponation can be succesful but root resorbtion can occur
- **Development problems**
  - Aplasia
  - Hard tissue deficiencies

Fábián G, Gábris K, Tarján I Gyermekfogászat Fogszabályozás és Állcsontortopédia Semmelweis Kiadó Budapest 2013
http://www.clinicadentalhotz.com/news-baby-bottle-syndrome.php

Carious lesions

- High caries risk
- Primary dentition – caries rapida (ECC)
- Early primary tooth extraction (1 year before permanent eruption)
  - Leeway space
  - Crowding in the permanent dentition





Trauma in the primary dentition

- Complicated fracture
- Intrusion
- Extrusion (more than 3mm)
- Luxatio partialis
- Luxatio totalis (avulsio)

- Loss of the incisors in primary dentition
- esthetic problem
- sometimes speech problems
- canines can maintain the space

- Role in space maintining: primary molar

Trauma in permanent dentition

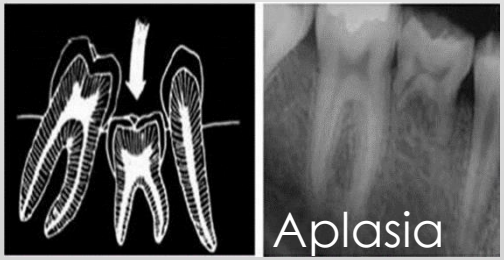
- Fractura
- Luxatio partialis
- Luxatio totalis (avulsio)

- Splinting
- Keep the tooth in place till 18 years of age
- If it is not possible minimally invasive prosthodontic solution
  - (Maryland bridge, acrylat bridge..)

Picture from:http://drdentonhardie.com/maryland-bridge.html

Types of missing germs

- Aplasia
- Anodontia partialis
- Oligodontia
- Anodontia totalis



Genetic deficiency of dental hard tissues

- Generalized in both dentures and on all teeth
- Amelogenesis imperfecta
  - 12 various forms 2 most frequently:
  - hypoplastic form
    - smooth, thin enamel
  - hypomineralisated form
    - not even enamel, normal thickness

- Dentinogenesis imperfecta
  - Facultative symptome for osteogenesis imperfecta
  - Primary dentition : amber brown
  - Permanent dentition:
    - fractures of the enamel,
    - brown dentin remaining

Rare defects: dentindysplasia, rachitis

Environmental defect of tooth formation

- Severe Fluorosis
  - Too much fluoride intake during the dental development period
  - White-brownish discoloration, hypomineralisation

- Molar und Incisor hypomineralisation
  - The etiology is still not known.
  - Occurs in case of harmful effects between 0-2 years of age
    - AB, fever, malabsorption problems..
  - 0-2 years- the time of the development of the first molars and incisors

- Turner tooth
  - trauma
  - inflammation

Advantages of prosthodontic treatments

- Esthetic (Parents)
  - realistic /unrealistic
  - In case of loosing more teeth/ oligodontia, anodontia
    - Facial height reduction
- Speech therapy
  - speech problems prevention/correction
  - Missing of the front teeth - wrong dentoalveolar, labiodental pronunciation (l,t,d,sz,c,r,z)
- To restore the function(chewing, swallowing, uttering)
- Prevention of harmful habits and malfunctions (pathological tooth migration)
- Obturator role (Cleft palate)
- Protection of the teeth
  - Abrasio, caries , position

Disadvantages of the dentures

- Caries
  - Faster and greater amount of plaque accumulation
  - Damage to periodontium
    - Plaque accumulation more bacteria gingivitis, parodontitis
    - mycosis
- Problems with tooth development
  - No space for the new teeth
  - The pressure of the prosthesis accelerates the eruption of the permanent tooth
  - Bone loss in the alveolar ridge
    - Tilting removable prothesis
- Inflammation of the mucosa
  - More pressure, moving prosthesis, trauma, ulcers

Differences and similarities in the prosthetic care in adult and childhood

- **Similarities**
  - Function restauration
    - Chewing, speaking
  - Esthetic
  - Prevention of bad habits and malocclusions (deep bite, crossbite, progen, prognath)

- **Differences**
  - The lower and upper jaw are under development
  - Primary-permanent teeth changing
  - The permanent tooth is under development by mixed dentition
  - More difficult cooperation with patients

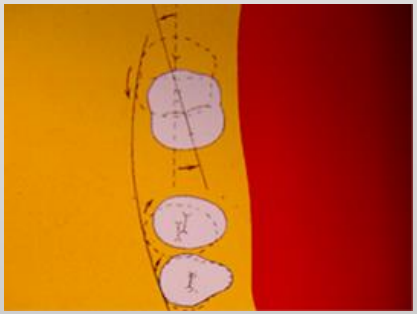
Orthodontic aspects

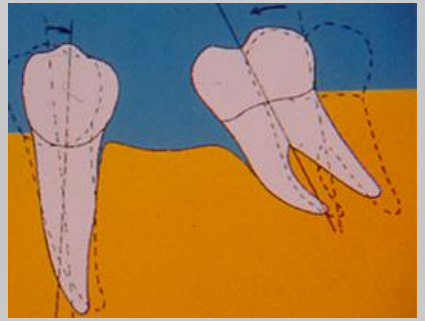
- Orthodontic treatment can make tooth replacement unnecessary
- Orthodontic treatment can create more favorable conditions for dentures

Preprotetic and orthodontic treatment

↓

- Axis correction of the abutment teeth
- Movement of the abutment teeth
- Crossbite treatment
- To use displaced teeth for abutment teeth
- Address the consequences of periodontal disease





Treatment plan

- Thorough anamnesis:
  - Form und structure of the teeth
  - Number of cavities
  - Position of the tooth before eruption
- Which teeth need prosthodontic treatment? (physiological tooth loss)
- Can the teeth hold the clasps?
- Stability (additional anchorage)
- Thorough chronological view (growth of the arch, time of the tooth eruption)

Prosthodontic in primary and mixed dentition

Removable

- Overdenture
- Full denture
- Partial denture
- Removable space maintainers
- Mouth guard
- Sometimes combined with orthodontic appliance

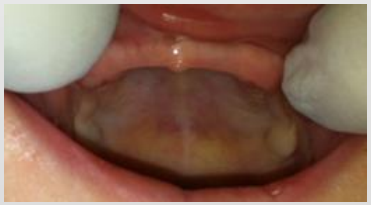
Fixed- mind the jaw and tooth development!

- Crowns
- Bridges
- Inlay, onlay
- Post
- Fix space maintainer
- Implants

Removable prosthodontics: process -full denture

- Impression
  - Explain the process for the child
  - Size of the impression tray: the smallest, which is still good
  - Quick curing impression material
  - Individual tray- functional impression- same as adults
- Wax bite – determine CR and CO
  - Determine Centric Relation position of the mandible – 3mm CO
  - We should carefully push the mentum back / ask the patient to swallow
  - Fix the wax bites together
- Probe- acryl teeth already in the wax- can be modified by the lab
  - Check occlusion and function
- Prothesis
  - check occlusion and function
  - teach how to use
- Control (1 day, 1 week, 1 month … etc.)

Case report-Anodontia totalis







Case report-Anodontia totalis






Removable prothesis for children

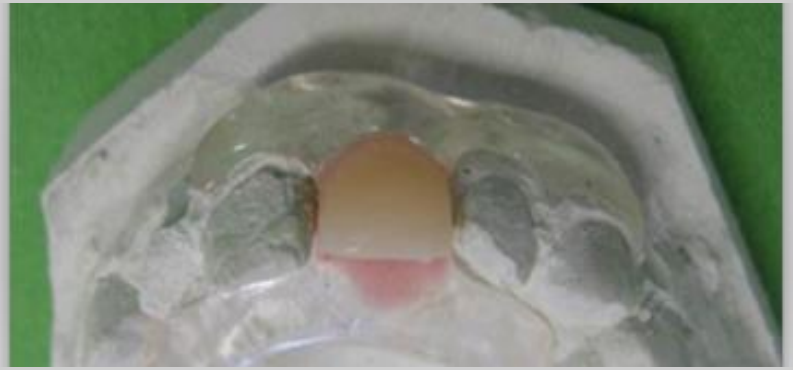
Indication:

- Multiplex aplasia
- Jaw is under development
- Teeth eruption and movement is under physiologic change
- Space maintaining-
  - Nance appliance
  - Hawley retention plate with acryl teeth

Removable prosthesis after trauma in adulthood

21 tooth avulsio

Till the age of 18 acrylat crown with partial denture



Mouth guards

- **Stock mouthguard**
  - Sold ready to be usedwithout any additional customization
  - Material: polyvinil clorid, polyuretane, vinil acetate copolimer
  - Limited number of sizes- should cover back teeth as well!
  - Slack fit- compensation- clenching teeth together
  - Speak and breathe is difficult
  - Cheap but minimal protection

Mouth guards

- **Mouth formed mouth guard**
  - Customized by the user at home
  - Higher level of protection
  - Firm plastic outer shell (polyvinil clorid) +Relatively spongy internal layer (acryl gel/ silycone)
  - Other type: „boil and bite” EVA- thermoplastic material
  - Disadvantage- home made form can be thinner some part lower protection
- **Custom made mouth guard**
  - Made in dental laboratory
  - Highest level of protection but most expensive
  - Minimal convenience when worn

Fixed prosthodontics
Crowns

Treatment of pulpally involved teeth/ more surface carious lesions

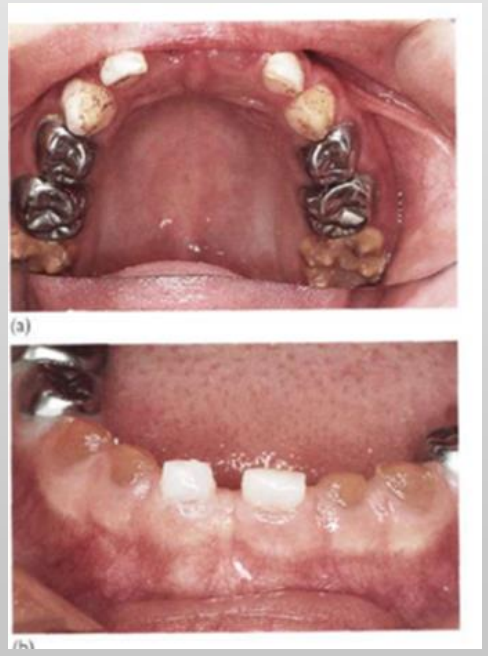
Provide protection to the remaining tooth structure+ for further caries

- Stainless steel crown
- Esthetic crown (ceramic/ zircone)
- Polycarbonate crown

Duggal MS, Curzom ME: Stainless Steel Crowns for primary molars in: Restorative techniques in pediatric dentistry 2nd ed

Stainless steel crowns

- **Indications:**
  - primary molars requiring large multisurface restorations
  - teeth with rampant caries
  - teeth after pulp therapy
  - teeth with developmental defects

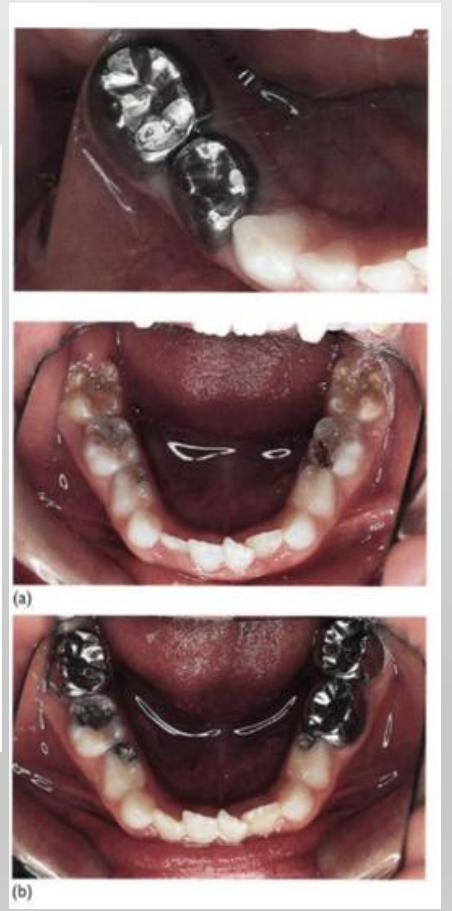


Duggal MS, Curzom ME: Stainless Steel Crowns for primary molars in: Restorative techniques in pediatric dentistry 2nd ed

Stainless steel crowns

Indications:

- fractured primary molars
- as an abutment for space maintainers
- in children with bruxism
- Hypoplastic young permanent molars



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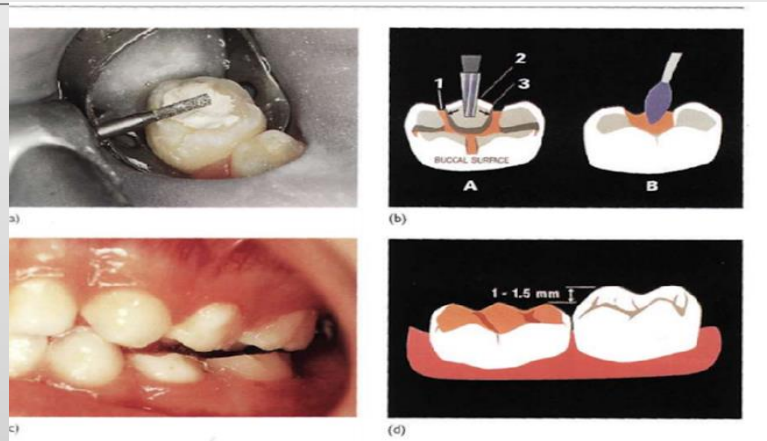
Fitting stainless steel crowns

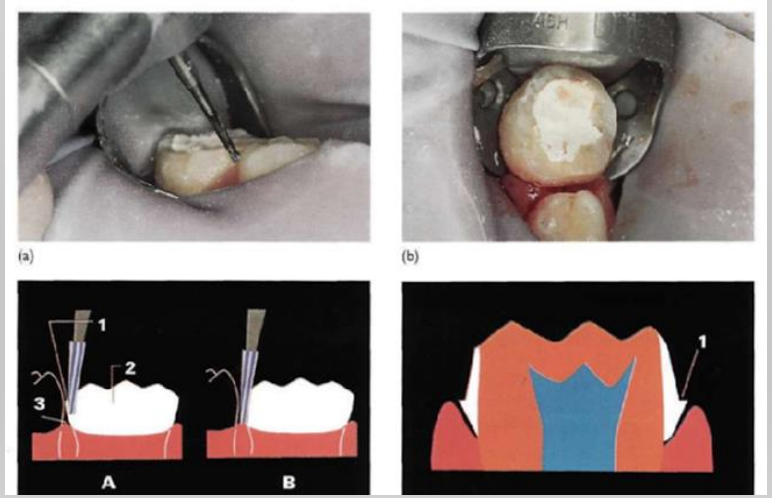
Local analgesia-not necessary after pulp therapy, (rubber dam)

Reduction of occlusal height

Reduction of proximal surfaces

- 1 tooth structure visible, proximal
- 2 buccal
- 3 gingival crest
- 4 round off sharp edges





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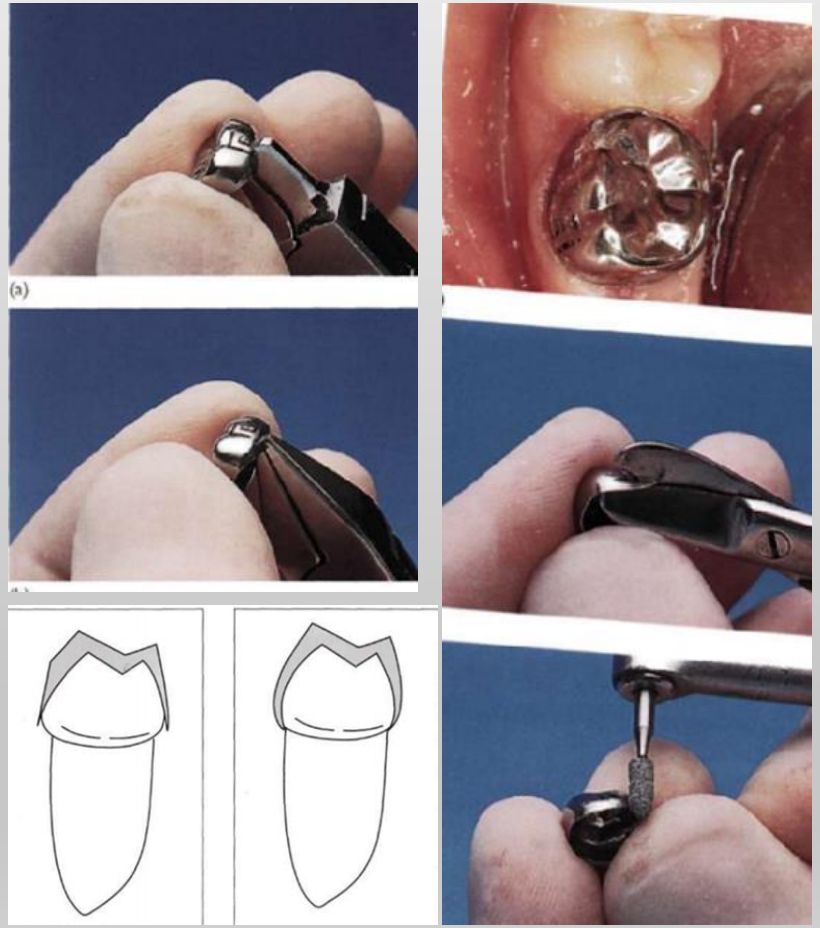
Fitting stainless steel crowns

Select a crown- measure the mesio-distal width of the tooth prior to preparation- use this to select the appropriate size

First seat the crown lingually and after rotate buccally

Fitting stainless steel crown

Adjust the crown with special pliers



Avoiding permanent molar impaction, on the second primary molar distal slice should be made

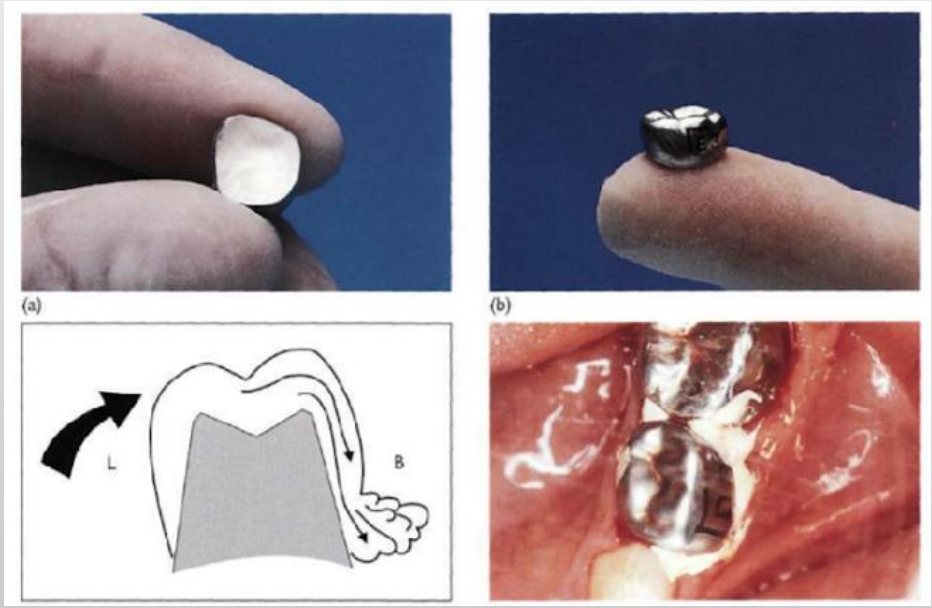
Fitting stainless steel crown

Cement the crown on the tooth with polycarboxylate cement

Almost fill the crown with cement!

Seated on the lingual side and rotate to the buccal

Remove excess cement- with floss subgingivally



Duggal MS, Curzom ME: Stainless Steel Crowns for primary molars in: Restorative techniques in pediatric dentistry 2nd ed

Strip crowns

Indications:

- Extensive or multisurface caries in primary incisors
- Congenitally malformed primary incisors
- Discoloured front teeth
- Trauma, fracture
- Congenitally discoloured incisors (for eg. Porphyria)
- Amelogenesis/ dentinogenesis imperfecta

Duggal MS, Cruzon ME: Strip crowns for primary incisors in: Restorative techniques in pediatric dentistry 2nd ed.

Strip crowns

Relative isolation

Size of celluloid crown is chosen

Remove caries

Preparation for strip crown

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Strip crowns

Celluloid crown trimmed with scissor

Vent holes are made foe excess composite

+CaOH for the deepest part of the cavities

Duggal MS, Cruzon ME: Strip crowns for primary incisors in: Restorative techniques in pediatric dentistry 2nd ed.

Strip crowns

Etch, bond the surfaces

Fill the crown with composite

Remove excess

Polimerise

Remove crown

Polish

(In case of lack of cooperation- glasionomer cement

Removing the strip crown is not necessary)

Duggal MS, Cruzon ME: Strip crowns for primary incisors in: Restorative techniques in pediatric dentistry 2nd ed.

Esthetic crowns

Esthetic crown

- Thicker- acrylat/ ceramic cover
- 2mm preparation –pulp chamber is close!

Polycarbonat crown

- prefabricated
- minimal preparation
- Less resistivity- contraindication: bruxism

Zelluloid crown - trauma

When apex (8-11 age) is open we must wait with the adhesive filling till the development of the tooth ended.

Zelluloid crown can protect the tooth

Prefabricated crowns- only choose the right size and adjust

Fill up with glasionomer

Bridges

Not indicated when jaws are growing

Just after 16-18 years of age

After adulthood the indications and the process of making fixed prosthodontic treatment is the same

By primary dentition we can make acryl bridges for the front region with loops not to stop growing

+ any prosthodontic solutions beside crowns should be observed and change after 1 year because of the developmental changes

Acrylbridge

- With the loop can the upper jaw develop- regular check up, dentist open the loop
- Impression without or slight preparation

Crowns

- At least until 16 years (after the development of occlusion finished) only acrylate crown with minimally invasive preparation

- About 16-18 years old we can make metal ceramics / ceramics / zirconium crowns

- For molars due to the defect of the enamel / dentin formation:
  - Metal> acrylate crown
  - (Acrylate can be broken more easily)

Crowns

Dentinogenesis imperfecta

After eruption, making crown for the permanent teeth is suggested to protect them

Bridge

Dentinogenesis imperfecta

Patient has all permanent teeth

Acrylat Bridge/ crowns for all permanent teeth

After occlusion development ended we can change them for more esthetic pocelains/ zircon

Space maintainer

- Early primary tooth extraction- high caries activity
- „slimmer” space maintainer- less plaque-accumulation
- The development of dentition and the growth of the alveolar process must not be hindered.
- Fix appliance mostly for one missing tooth replacement
- removable for more missing tooth replacement
- Role:
  - keep the sagittal distance
  - Support for the antagonist teeth
  - Minor orthodontic corrections (removable orthodontic plates)

Fix space maintainer







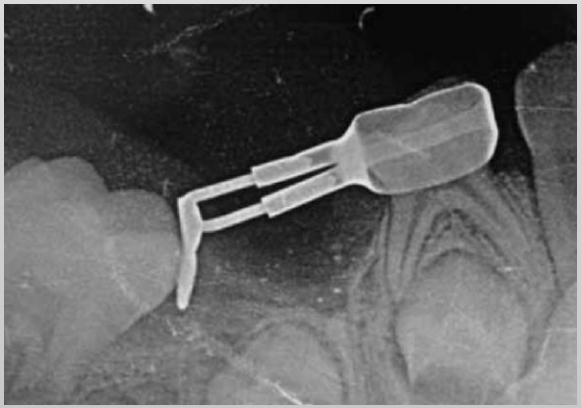

Bilateral tooth loss mesial shift of the molars prevent it with **Nance appliance** in upper jaw and **lingual arch** im lower jaw (lingual arch can work just with stable front teeth)

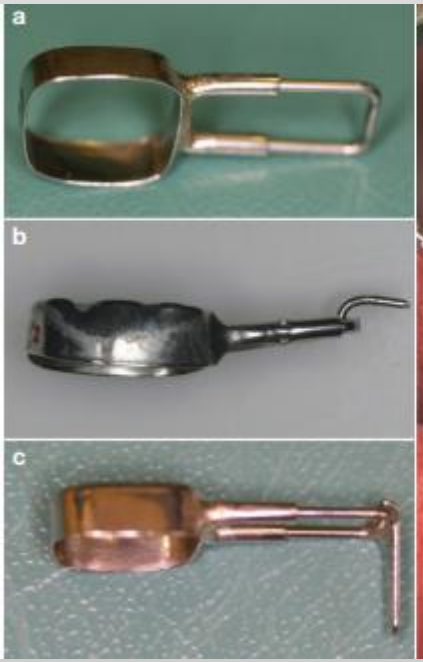
Fix space maintainer

Special space maintainer – with„Distal shoe”

- aim: to guide the permanent molar in the right place without mesial eruption and impaction of the permanent 5

Early extraction of the second primary molar





Removable space maintainer

Indication:

- after the primary tooth loss, the permanent tooth eruption time is more than one year
- removable space maintainer need more cooperation

Conclusions

Prosthodontics have different aspects by children and adulthood

We need to take into consideration the child age, cooperation and development of the teeth and bones

The aim is to rehabilitate function and esthetics

Before permanent teeth eruption keep the space

Before we can make permanent solution save/ prepare circumstances for that


Thank you
for your Attention!