PD

PEDIATRIC DENTISTRY

PREFABRICATED CROWNS
PRACTICAL TRAINING

SUBJECT

ZLDL a0922c

PRACTICE

Vacational practice assigned to the 4th year of Dentistry is required.

OBJECTIVE

After termination of the practical training the students will be familiar with theoretical basis and practical skills necessary for treatment of primary dentition by prefabricated crowns.

KNOWLEDGE

Knowledge necessary for the enrolment of the subject is given in corresponding prerequisites.

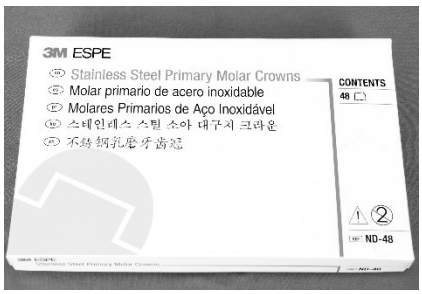
TARGET GROUP

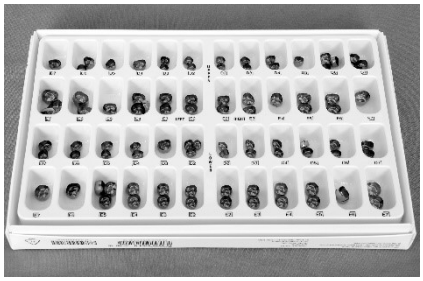
Students of the 5th year, Dentistry

OUTCOMES

Students are familiar with working procedures essential for the treatment of the primary dentition with prefabricated stainless steel crowns and are able to treat the children in the clinical part of the subject: Paediatric dentistry.

PREFABRICATED CROWNS





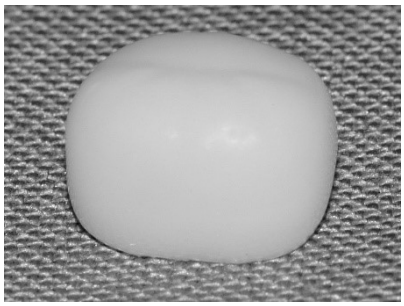
Treatment of teeth in primary and in permanent dentitions using procedures of fixed prosthetics is very difficult and is chosen only in cases of heavily destructed teeth by dental caries or in case of anomalies in the hard dental tissues structure. Many factors make the treatment in children by crowns difficult. Above all the difficult cooperation with a small child, the time-consuming procedure which desires proper tooth grinding, impression of both the treated and antagonal jaws and taking of wax bite record. Enamel layer and dentinal core of primary teeth are very thin, and the dental pulp cavity is extensive. In permanent teeth, the enamel thickness does not differ from that of adults, but the dentin layer is very thin and dental pulp cavity large, especially in teeth with developing (open) apices. Introduction of prefabricated crown technique is therefore great progress in pedodontics treatment possibilities. They are produced from stainless steel or nickel-chromium for distal teeth of primary dentition. The crowns are produced in five to seven sizes for each tooth of primary dentition and for the first molar of the permanent dentition. They are adapted and cemented on the slightly grinded tooth in one visit so that remaining clinical and laboratory procedures are not necessary. Minimal tooth grinding is enabled by very thin layer of the metal used for the crown (0.2 mm). The prefabricated crown is owing to its thickness very flexible so that it can easily be adapted in the gingival area and it can get over small irregularities in the preparation. The crown should reach approximately 1-1,5 mm below the gingival margin (into the sulcus). Retention of the crown is increased by cingulum; the crown should snap over it. The metallic prefabricated crowns are not esthetical that is why they cannot be used for the frontal region. Recently, new types of crowns aesthetically acceptable appeared on the market both for frontal and distal parts of dentitions. The preparation for these crowns, demands, however, greater removal of hard tissues, that is why the teeth devitalisation in the frontal region with following endodontic treatment is often necessary.

TYPES OF PREFABRICATED CROWNS

There are many types of prefabricated crowns on the market at the present time**.** The differences among them are not only in the material used for their fabrication, but also in the way of their fastening on the prepared tooth crown.

CLASSIFICATION ACCORDING THE MATERIAL USED

- All metallic crown (stainless steel, nickel-chromium, aluminium, tin based crown)
- Stainless steel crown with facing (veneer)
- Resinous/composite crown
- Stainless steel crown
- Ceramics



CLASSIFICATION ACCORDING TO THE KIND OF FIXATION TO THE TOOTH

- Cementation using luting cements
  Zinc oxide phosphate, Zinc oxide eugenol, Polykarboxylate, Glassionomer
- Bonded
  resin based
  composite based

INDICATION

RECONSTRUCTION OF THE CLINICAL CROWN

- in primary molars with extensive caries which cannot be restored with the filling therapy
- in permanent molars with extensive caries which cannot be successfully treated with the filling therapy (long lasting provisory treatment)
- in primary teeth with developmental anomalies of the enamel
- in permanent molars with developmental anomalies of the enamel (e.g. molar-incisor hypomineralization – MIH).
- in primary molars after pulpotomy
- in genetically conditioned developmental anomalies of dental hard tissues (amelogenesis imperfekta hereditaria, dentinogenesis imperfekta hereditaria).
- in fractures of tooth crowns
- in caries localized on the mesial surface of the first primary molars (high risk of the dental pulp exposure during cavity preparation – high horns of the dental pulp)
- in children with the high risk of caries.
- in teeth with expressive attrition, abrasion or resorptions.
- in teeth with cervical demineralisations (particularly circular).
- in case of unsuccessful filling therapy (more tooth surfaces involved)
- impossibility to maintain the dry field isolation

PART OT THE FIXED SPACE- MAINTAINERS

CONTRAINDICATION

- primary tooth before shedding (more than ½ of the radix resorbed, expected exfoliation in 6-12 months).
- clinical or X-ray findings of pathological changes in the dental pulp or in the periodontal tissue

WORKING PROCEDURE

FIG. 1

- occlusal reduction by 1,0 – 1,5 mm maintaining the cuspal inclines of the crown
- burs: fissure bur, diamond plated fissure bur, tapered bur, diamond plated tapered bur

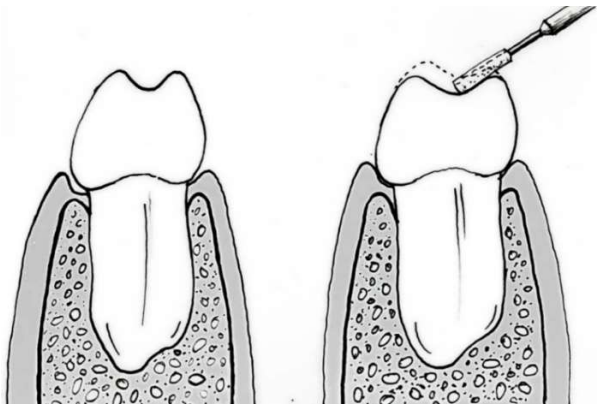


FIG. 2

- approximal reduction
- nearly vertical walls to the long axis of the tooth, slight convergence in an occlusal direction - 10° maximally
- thin diamond tapered bur
- gingival margin – feather-edge finish line, no shoulder, no chamfer

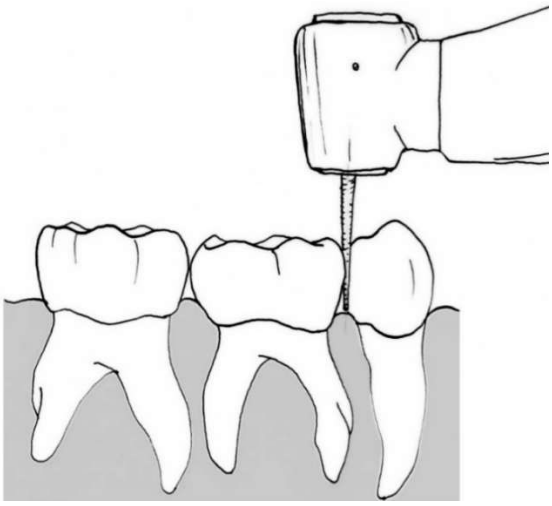
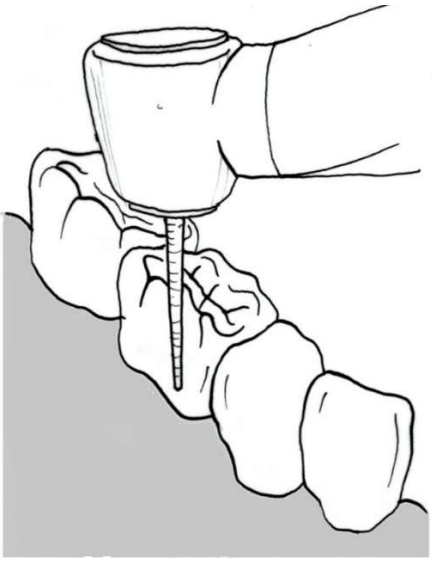


FIG. 3

- in some cases, reduction of buccal and lingual surfaces is either unnecessary or very minimal
- reduction of large buccal bulge (first primary molar)
- thin diamond tapered bur



Notes:

FIG. 4.A

- buccal view of the lower right quadrant

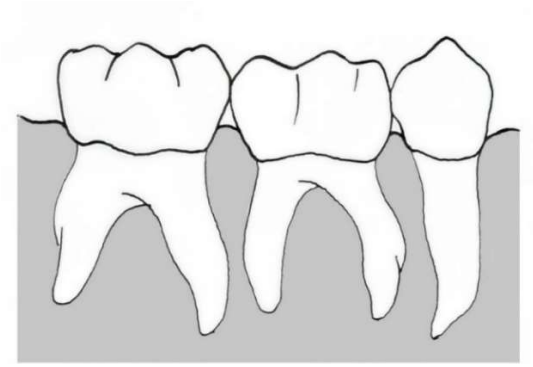


FIG. 4.B

- buccal view – occlusal reduction, no shoulder, no chamfer, feather-edge preparation

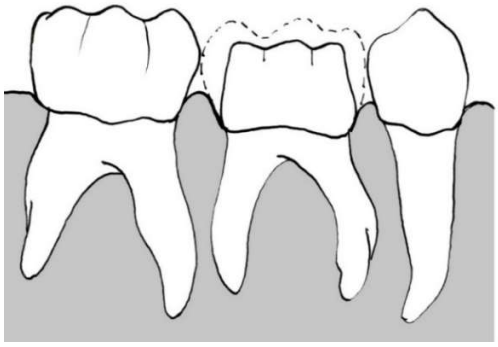


FIG. 5.A-B

- approximal view:
  A) before preparation
  B) after preparation

Buccal and linqual convexity is maintained

A) **B)**

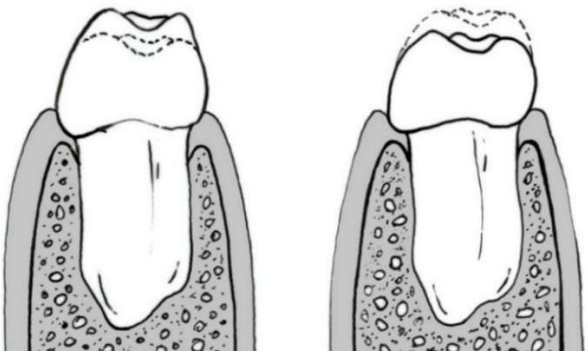


FIG. 6A-B

- the same attitude for young permanent molars

A) **B)**

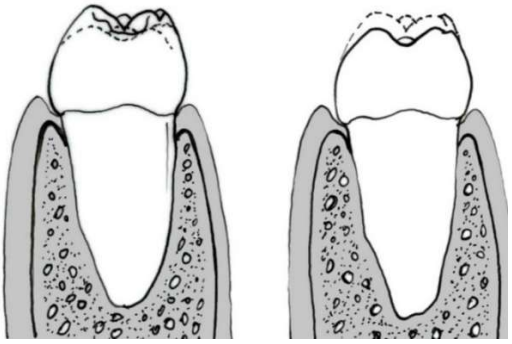


FIG. 7.A

- width of the space available is measured and proper size of crown is selected (Boley gauge)
- before preparation

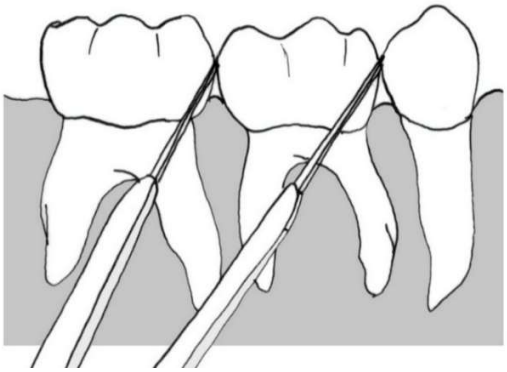


FIG. 7.B

- after preparation (trial and error)

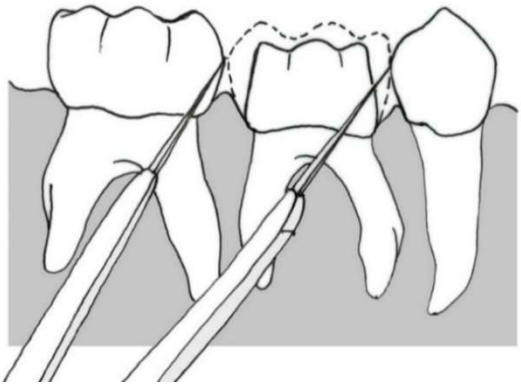


FIG. 8

Reduction of the crown height:

- trimming with scissors crown margin minimally 1mm beneath the free gingival margin

If gingiva blanches – the crown is too long

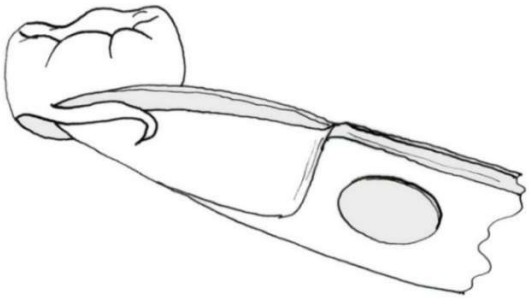


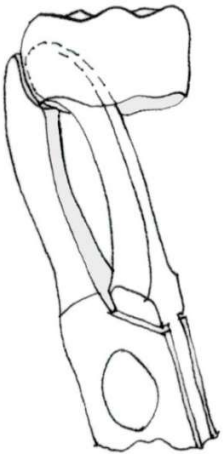
FIG. 9.A-B

Margin contouring :

A) primary molar
B) permanent molar

Gingival edges – crown contouring-pliers, Johnsons pliers, curved beak pliers.

A)



B)

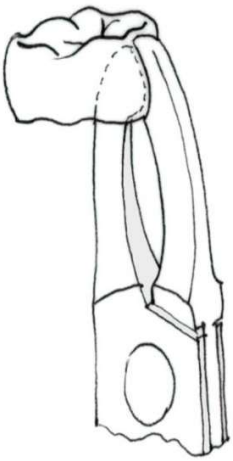
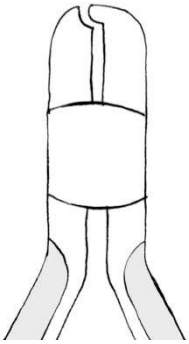


FIG. 10.A-B-C
Crown contouring.

- crown-crimping pliers may also be used for crown contouring
- points of contact – ball and socket pliers
- band stretching pliers

A)



B)

C)

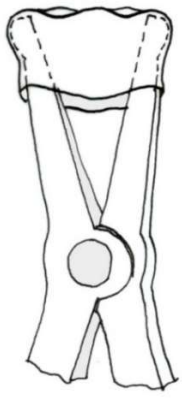
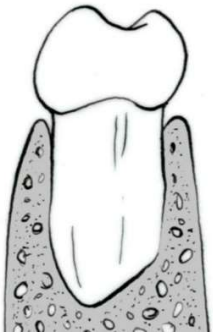


FIG. 11

- crown margins are finished and polished – feather edge

FIG. 12

- falsely adapter crown margin (margin supragingivally), does not reach below the gingival margin



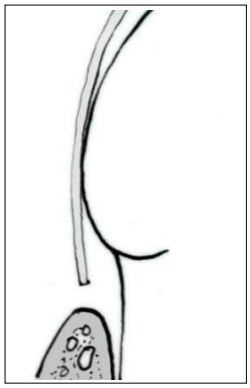
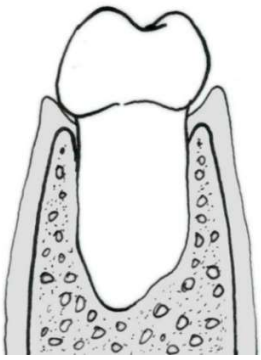


FIG. 13

- correctly adapted crown margin (margin subgingivally)



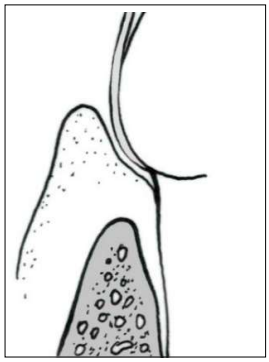


FIG. 14

Crown adaptation:

- crown is placed first lingually, turned over the occlusal surface buccally under slight pressure
- crown is then pressed down

FIG. 15
Mistakes on crown adaptation:

- a ledge formation prevents proper seating the crown
- extensive preparation results in crown tilting
- over extent of the crown - too subgingivally
- crown is short

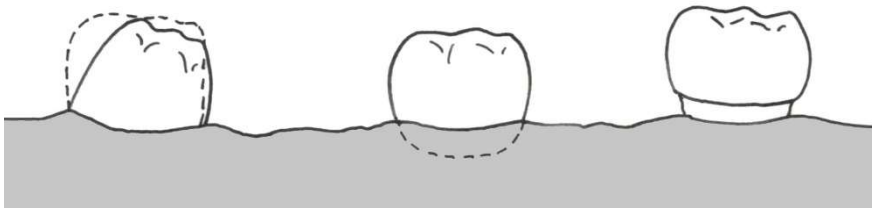


FIG. 16
Set of burs for tooth preparation

FIG. 17
Set of instruments for tooth grinding

Notes: