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Dental caries:
Clinical, diagnosis, complications, prevention

(TUTORIAL)

Poltava

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Рекомендовано Центральним методичним кабінетом з вищої медичної освіти МОЗ України як навчальний посібник для студентів стоматологічних факультетів вищих медичних закладів освіти III – IV рівнів акредитації (протокол №4 від 27.12.2012 р.).

Навчальний посібник для англомовних студентів побудований у відповідності до типового навчального плану. Автори надають сучасну класифікацію карієсу зубів та його ускладнень, клінічні прояви, особливості діагностики кожної нозологічної одиниці, включаючи скарги та анамнез хвороби. У посібнику також наведені протоколи лікування карієсу, пульпіту, періодонтиту згідно МКХ-10, де відображені методики та лікарські засоби, які необхідно використовувати у кожному випадку, є перелік прописів препаратів для терапевтичної стоматології. Окремо представлені сучасні принципи профілактики карієсу та його ускладнень.

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INTRODUCTION

The main aim of education at higher medical establishment is forming of high professional skills for future dentists. The major task of this establishment's teachers is training of high skilled specialists for work at practical public health area.

One of the main factors of vocational fitness of future dentists is the level of practical skills possession and ability to apply those skills in standard and nonstandard clinical situations during professional activity.

Significant development in medicine, high achievements in diagnostics and dental diseases prevention make dentist work better and more qualitative. Quite big amount of special medical tutorial literature deals with aetiology, pathogeny, clinical presentations and treatment of dental pathology.

In spite of high prevention level caries is the most wide spread disease. Its early treatment prevents pulpitis and periodontitis development.

The study of odontopathology clinic picture, caries clinical course peculiarities, caries complications and its treatment are the most important and voluminous parts in preventive dentistry research.

In this tutorial we provide the classifications and detailed description of clinical presentations of different forms of caries, pulpitis and periodontitis. There are also standards (records) of these diseases' treatment that are presented here according to the International Classification of Diseases (ICD-10).

CARIES

Caries (according to WHO) is a pathologic process of unknown aetiology which is characterized by demineralization of tooth hard tissues that is followed by such defect as cavity forming.

Caries Classification.

Clinical:

1. Initial, acute, chronic.
2. Superficial, acute, chronic.
3. Median, acute, chronic.
4. Deep, acute, chronic.

According to caries localization:

1. Fissure (class I according to Black).
2. Contact, approximal (class II, III, IV according to Black).
3. Precervical (class V according to Black).
4. Atypical (class VI according to Black).
5. Circular.

Anatomic:

1. Enamel caries.
2. Dentine caries.
3. Cemental caries.
4. Arrested caries.
5. Odontoclasia.

6. Different caries.
7. Unspecified caries.

According to complications existence:

1. Simple caries (uncomplicated).
2. Complicated caries.

According to clinical course:

1. Acute caries.
2. Chronic caries.
3. Multiple (blossoming) caries.
4. Secondary caries.
5. Recurrent caries.
6. Pulpless teeth caries.

Caries classification according to IDC – 10

K02 Teeth caries

K02.0 Enamel caries

K02.1 Dentine caries

K02.2 Cemental caries.

K02.3 Arrested teeth caries.

K02.4 Odontoclasia

K02.8 Different teeth caries

K02.9 Unspecified teeth caries

K03 Another diseases of teeth hard tissues

Excepted:

Bruxism (F45.8)

Teeth caries (K02.-)

Tooth-grinding BDU (f45.8)

K03.0 High teeth elimination.

K03.1 Teeth snagging

K03.2 Teeth erosion

K03.3 Pathologic teeth resorption.

K03.4 Hypercementosis

K03.5 Teeth ankylosis

K03.6 Dental deposits

K03.7 Color change of teeth hard tissues after dentition.

Excepted: dental deposits (K03.6).

K03.8 Another specified teeth hard tissues diseases.

K03.9 Unspecified teeth hard tissues disease.

CARIES CLINICAL PICTURE

Initial acute caries

Complaints: there is a drawing of mouth feeling and tooth hypersensitization when sour food taking. There is also a cosmetic defect as a white stain on vestibular (contact, grinding) tooth surface.

Medical history (according to patient's words): the tooth hasn't been treated yet. Hyperesthesia and drawing of mouth began 2-4 weeks ago. Cosmetic defect appeared to be visible a month ago.

Objective patient examination: There is white chalky stain with well-defined borders on vestibular (contact, grinding) tooth surface. The stain becomes matt and loses glitter when drying. *Probing* is painless, the stain is rough, the probe doesn't hook, it is sliding on stain surface. *Palpation* and *percussion* are painless. *Thermodiagnosis* is painless too. *EOD* – 2-6 microampere. The stain becomes blue when *vital staining* with 1% methylene blue. The stain becomes dull, it doesn't «shine» when luminescent diagnosing.

Chronic initial caries

Complaints: there is a cosmetic defect as a pigmented stain of brown color on vestibular (contact, grinding) tooth surface. Sometimes there is unpleasant feeling in a tooth when sour and sweet food taking.

Medical history (according to patient's words): the tooth hasn't been treated yet. The stain appeared approximately 4-6 months ago. It is used to be white colored but now became brown.

Objective patient examination: There is a pigmented stain of brown color with well-defined borders on vestibular (contact, grinding) tooth surface in cervical area. The stain becomes matt and loses glitter when drying. *Probing* is painless, the stain is rough, the probe doesn't hook, it is sliding on tooth surface. *Palpation* and *percussion* are painless. *Thermodiagnosis* is painless too. *EOD* – 2-6 microampere.

Acute superficial caries

Complaints: there is brief pain feeling which is caused by chemical (sweet, sour), thermal irritants. This pain disappears as the irritants are gone. Sometimes pain is caused by mechanical irritants (when teeth brushing – provided that the defect is in cervical area). There are also complaints of food between teeth and discomfort which is caused by it, interdental papilla timidity (provided that the defect of tooth hard tissues is on contact surface). There is a cosmetic defect on tooth surface.

Medical history (according to patient's words): the tooth hasn't been treated yet. Pain caused by irritants appeared approximately 1-1,5 months ago.

Objective patient examination: There is white chalky stain with well-defined borders on vestibular (contact, grinding) tooth surface. The stain becomes matt and loses glitter when drying. There is light defect within the enamel borders on white stain. *Probing* is sensible, the stain is rough, the probe hooks, it is not sliding on stain surface. The enamel is fragile and friable. *Palpation* and *percussion* are painless. *Thermodiagnosis* is positive, pain disappears quickly as the irritants are gone. *EOD* – 2-6 microampere. The stain becomes blue when *vital*

staining with 1% methylene blue. The stain becomes dull, it doesn't «shine» when luminescent diagnosing.

Chronic superficial caries

Complaints: there is a cosmetic defect as a pigmented stain of brown color on vestibular (contact, grinding) tooth surface. Sometimes there is short term pain in a tooth because of thermal irritants.

Medical history (according to patient's words): the tooth hasn't been treated yet. The stain appeared approximately 3-5 months ago. It is used to be of light brown color but it has changed step by step now it became darker.

Objective patient examination: There is a pigmented stain of brown color with well-defined borders on vestibular (contact, grinding) tooth surface in cervical area. There is a defect with flat edges within the enamel borders on the stain. *Probing* is painless, the stain is rough, enamel is dense, the probe is hooking. *Palpation* and *percussion* are painless. *Thermodiagnosis* is sometimes sensible from cold irritants but unpleasant feeling passes soon as the irritant is gone. *EOD* – 2-6 microampere.

Acute median caries

Complaints: there is brief sharp pain feeling which is caused by chemical, thermal irritants. This pain disappears as the irritants are gone. Sometimes pain is caused by mechanical irritants (when teeth brushing). There are also complaints of tooth hard tissues defect, cosmetic defect.

Medical history (according to patient's words): the tooth hasn't been treated yet. Pain caused by chemical and thermal irritants (sour and sweet food) appeared approximately 2 months ago. The tooth defect appeared to be visible around 3 weeks ago.

Objective patient examination: There is tooth hard tissues defect as carious cavity with narrow inlet and overhanging chalky white edges of fragile enamel. The probe is hooking while *probing*, it sticks. The carious cavity is within the mantle dentin area. The dentin of pulp floor and walls is soft, grey colored, it can be easily removed as layers. Pulp floor *probing* is painless. The pulp walls *probing* is painful within the enamel dentin border. *Palpation and percussion* are painless. *Thremodiagnosis* is painful (especially when taking cold), the pain goes away quickly as the irritant is gone. EOD is 2-6 microampere.

X-Ray diagnostics (is used in case of «hidden» carious cavity): there is tooth hard tissues defect with narrow inlet within the mantle dentin area and without connection with dental cavity.

Chronic median caries

Complaints: there is a carious cavity in a tooth. Sometimes some food stays in the tooth. There is also a cosmetic defect in the tooth.

Medical history (according to patient's words): the tooth hasn't been treated yet. Short term pain caused by chemical and thermal irritants appeared approximately 9 months ago. The pain has disappeared with the lapse of time. The carious cavity appeared to be visible around 6 months ago.

Objective patient examination: There is tooth hard tissues defect as carious cavity with wide inlet within mantle dentin area. The pulp floor dentin and pulp walls dentin is pigmented. It is dense and sclerosed while *probing*. The pulp floor and walls probing is painless. *Palpation and percussion* are painless. *Thremodiagnosis* is painless. EOD is up to 10 microampere.

X-Ray diagnostics: there is tooth hard tissues defect with wide inlet within the mantle dentin area. There is no conection with pulp chamber. There are no changes in periodont tissues.

Acute deep caries

Complaints: there is brief acute pain feeling in a tooth which is caused by chemical, thermal, mechanic irritants. This pain disappears as the irritants are gone. Sometimes there is some food in the carious cavity. There are also complaints of cosmetic defect.

Medical history (according to patient's words): Pain caused by sweet and cold irritants appeared approximately 2 months ago. The tooth defect appeared to be visible around 1 month ago.

Objective patient examination: There is tooth hard tissues defect as carious cavity with narrow inlet and overhanging chalky white edges of fragile enamel. The probe is hooking while *probing*, it sticks. The carious cavity is within the parapulpal dentin area. The dentin of pulp floor and walls is soft, grey colored, it can be easily removed as layers. Pulp floor *probing* is painful. The pulp walls *probing* is sensible within the enamel dentin border. *Palpation and percussion* are painless.

Thremodiagnosis is painful, the pain goes away quickly as the irritant is gone. EOD is up to 15 microampere.

X-Ray diagnostics: there is tooth hard tissues defect with narrow inlet within the parapulpal dentin area. There is no connection with pulp chamber. There are no changes in periodont tissues.

Chronic deep caries

Complaints: there is a carious cavity in a tooth. There is also unpleasant feeling in the tooth when cold or sour food taking. Sometimes some food stays in the tooth. There is also a cosmetic defect in the tooth.

Medical history (according to patient's words): The pain caused by irritators appeared approximately 11-12 months ago. The pain has disappeared with the lapse of time. The carious cavity appeared to be visible around 5 months ago.

Objective patient examination: There is hard tooth tissues defect as carious cavity within the parapulpal dentin area with wide inlet and without overhanging edges of enamel. The dentin of pulp floor and walls is pigmented. It is dense and sclerosed when probing. Pulp floor and walls *probing* is painless (sometimes it can be sensible on pulp floor in projection of dental pulp corn). *Palpation and percussion* are painless. *Thremodiagnosis* is painful, sometimes it is sensible from very cold irritants. The pain goes away quickly as the irritant is gone. EOD is up to 12-15 microampere. Sometimes it can be up to 10 microampere.

X-Ray diagnostics: there is tooth hard tissues defect with wide inlet within the parapulpal dentin area. There is no connection with pulp chamber. There are no changes in periodont tissues.

Multiple caries

Complaints: there is pain feeling in the teeth which is caused by chemical, thermal, mechanic irritants. The pain is acute and short-termed. This pain disappears as the irritants are gone (sometimes it does not). There are also many carious cavities in teeth of upper and lower jaw. The fillings often come out. The big amount of soft scab forms quickly. There is also saliva viscosity and bad breath.

Medical history (according to patient's words): The process has been progressing for one year. There is also endocrine system disease (pancreatic diabetes). It is possible the patient has also diseases of immune system, gastrointestinal tract and other organs and tracts.

Objective patient examination: There is quite big quantity of carious cavities (6-8 and more) in the teeth of upper and lower jaws. There is also some fillings mobility, secondary caries. The carious cavities are typical for caries of different stages of progress (acute and chronic initial, superficial, median, deep caries). The cavities in separate teeth came in one. They are situated in precervical areas. There is also circular caries and immune zones caries (chewing cusps, sculprum, tooth equator). There is a big amount of soft dental deposit on crowns of teeth. The *probing* is painful, *palpation* and *percussion* are painless (provided that there is no complicated caries). *Thermodiagnosis* is painful from irritants. The pain disappears as the irritants are gone (provided that

there is no complicated caries). The gingiva is edematic, hyperemic. It is bleeding when probe touching. The saliva is dense and viscous. There is bad breath. EOD is 6-18 microampere (depending on carious process stage).

Secondary caries

Complaints: there is tooth defect around filling, filling defect. The tooth responses for chemical and thermal irritants. The pain disappears as the irritants are gone.

Medical history (according to patient's words): The tooth has been treated already. The filling was set around 10-12 months ago. The pain appeared 7 months ago. The tooth defect became visible 1-2 months ago.

Objective patient examination: There is composite filling (amalgam or cement) with defected edge gapping. There is a gap between the tooth and the filling (the probe is hooking). The filling has changed its color (or movable). The *probing* is sensible, dentin is soft. *Palpation* and *percussion* are painless. *Thermodiagnosis* is sensible. The pain disappears as the irritants are gone. EOD is 10-12 microampere.

X-Ray diagnostics: there is a filling in the tooth. There is half-moon like or even stripe like enlightenment area between filling and tooth wall. The pulp chamber has no connection with carious cavity. There are no changes in periodont tissues.

If **secondary caries** is progressing in **pulpless tooth**:

Complaints: there is some food between filling and tooth, the filling is movable and it is not intact. The filling has changed its color. The tooth has changed its color.

Medical history (according to patient's words): The tooth was treated as for complicated caries 12-15 months ago. Defect appeared to be visible 6 months ago.

Objective patient examination: The tooth has changed its color. There is a composite filling which is 2/3 of the tooth. There is a gap between filling and tooth, the probe is hooking. *Probing, palpation, percussion and thermodiagnosis* are painless. EOD is higher than 100 microampere.

X-Ray diagnostics: The root canals are filled up to root apex. There are no changes in periodont tissues. There is a big filling in crown part of the tooth. There is half-moon like or even stripe like enlightenment area between filling and tooth wall.

CARIES TREATMENT

TREATMENT RECORD

Code IDC K.02.0 – 02.9

Acute initial caries of permanent teeth.

Clinical form: initial caries of permanent tooth, acute clinical course.

Treatment:

Local treatment:

- Remineralization therapy with fluorine, calcium, remineralization solutions, fluorid varnishes preparations use etc;
- Hermetization (noninvasive, invasive) of fissures of masticatory teeth (with the help of cements, hermetics of chemical and light polymerization);
- Electrophoresis of fluorid preparations: 1-2% solution of sodium fluoride etc (5-6 sessions);
- Electrophoresis of calcium preparations: 10% solution of calcium gluconate, calcium chloride, 2,5% solution of calcium glycerophosphate (5-6 sessions);
- Electrophoresis of remineralization preparations like «Remodent» etc.

General treatment:

- Normalization of a diet with limited intake of easy to digest carbohydrates (no more than 30g of sugar per day);

- Combined preparations of calcium, fluorine, microelements, vitamins if it is necessary (for example for pregnant women) – course of 30 days, 2 courses per year.

TREATMENT RECORD

Code IDC K.02.0 – 02.9

Chronic initial caries of permanent teeth.

Clinical form: initial caries of permanent tooth, chronic clinical course.

Treatment:

Local treatment:

- If carious stains are on frontal teeth and it is a cosmetic defect it is possible to snag it from enamel surface with following remineralization preparations treatment of these areas;
 - It makes sense to use whitening preparations (carbamide peroxide containing for decreasing of stain pigmentation level so there is less enamel to remove) before snagging;
 - Remineralizing therapy and electrophoresis are used if it is necessary after polishing when noncompensated caries clinical course. (See Local Treatment of acute initial caries);
 - If it is necessary to remove quite big amount of enamel with the aim of full stain removing then caused defect is corrected by composite material or compomers;
 - Dark brown or black carious stains are the manifestations of caries that has stopped (stationary caries) and as a rule do not require special

remineralization treatment except cases of its preparation removing as cosmetic defects.

TREATMENT RECORD

Code IDC K.02.0 – 02.9

Superficial caries of permanent teeth.

Clinical form: superficial caries of permanent teeth, acute clinical course.

Treatment:

Local treatment:

- local anesthesia if it is necessary;
- carious defect preparation;
- carious defect filling;
- if carious defect is on vestibular surface of frontal teeth and premolars it is filled by composites, compomers, glass ionomers cements;
- covering of other chalky colored masticatory surface molars fissures areas with sealant;
- remineralization therapy if there is quite big quantity of carious stains and enamel defects (see Local Treatment of Acute Initial Caries);
- sealing (noninvasive, invasive) of masticatory teeth fissures (by cements, sealings of chemical and light polymerization).

TREATMENT RECORD

Code IDC K.02.0 – 02.9

Superficial caries of permanent teeth.

Clinical form: superficial caries of permanent teeth, chronic clinical course.

Treatment: see Treatment Record of Acute Initial Caries

TREATMENT RECORD

Code IDC K.02.0 – 02.9

Median caries of permanent teeth.

Clinical form: median caries of permanent teeth, acute clinical course.

Treatment:

Local treatment:

- local anesthesia if it is necessary;
- preparation of carious cavity;
- it is necessary to conduct antiseptic treatment of carious cavity with the help of warm (36-37C) 0,02% furaciline, microcide solution, 0,5% ethony solution, 0,01% chlorhexidine bigluconate solution and other non-irritative antimicrobial remedies;
- if carious cavity is on vestibular surface of frontal teeth and premolars it is filled by composites, compomers, glass ionomers cements;
- if carious cavity is on masticatory surface of molars: preparation and filling of carious cavity with amalgam, composite, compomer or glass ionomers cements;

- preparation and filling of all fissures of molar masticatory surface if it is necessary;
- it is necessary to use insulating spacer of phosphate cement or glass ionomers cement when filling with the help of chemical polymerization composites and amalgam;
- covering of other changed colored masticatory surface molars fissures areas with sealant;
- sealing (noninvasive, invasive) of masticatory teeth fissures (by cements, sealings of chemical and light polymerization).

TREATMENT RECORD

Code IDC K.02.0 – 02.9

Median caries of permanent teeth.

Clinical form: median caries of permanent teeth, chronic clinical course.

Treatment: see Treatment Record of Median Acute Caries

TREATMENT RECORD

Code IDC K.02.0 – 02.9

Deep caries of permanent teeth.

Clinical form: deep caries of permanent teeth, acute clinical course.

Treatment:

Local treatment:

- local anesthesia if it is necessary;
- preparation of carious cavity;

- it is necessary to conduct antiseptic treatment of carious cavity with the help of warm (36-37C) 0,02% furaciline, microcide solution, 0,5% ethony solution, 0,01% chlorhexidine bigluconate solution and other non-irritative antimicrobial remedies;
- deep caries treatment is done within 2 steps. Medical liner is put on the carious cavity floor within the first step. The cavity is closed with temporary stopping for 7-14 days (maximum of 6-12 months);
- if deep acute caries treatment is delayed (for several months) the carious cavity is closed with temporary stopping of glass ionomer cement. If there is no complaints after this term (6 months, one year) the carious cavity is filled with composite materials;
- constant carious cavity filling is done within the second step;
- it is necessary to use insulating spacer of phosphate cement or glass ionomers cement when filling with the help of chemical polymerization composites and amalgam;
- covering of other changed colored masticatory surface molars fissures areas with sealant;
- sealing (noninvasive, invasive) of masticatory teeth fissures (by cements, sealings of chemical and light polymerization).

TREATMENT RECORD

Code IDC K.02.0 – 02.9

Deep caries of permanent teeth.

Clinical form: deep caries of permanent teeth, chronic clinical course.

Treatment:

Topical treatment:

- local anesthesia if it is necessary;
- preparation of carious cavity;
- it is necessary to conduct antiseptic treatment of carious cavity with the help of warm (36-37C) 0,02% furaciline, microcide solution, 0,5% ethony solution, 0,01% chlorhexidine bigluconate solution and other non-irritative antimicrobial remedies;
- carious cavity filling:

if carious cavity is on vestibular surface of frontal teeth and premolars it is filled by composites, compomers, glass ionomers cements;

it is necessary to use insulating spacer of phosphate cement or glass ionomers cement when filling with the help of chemical polymerization composites and amalgam;

sealing (noninvasive, invasive) of masticatory teeth fissures (by cements, sealings of chemical and light polymerization).

CA-CONTAINING PREPARATIONS

USED WHEN DEEP CARIES TREATMENT

Life (Keer) – is a material of chemical hardening on the basis of calcium hydroxide. It is used for inndirect and direct dental pulp covering. It is also resistant to 50% orthophosphoric acid solution.

Dycal (Dentsply) - – is a material of chemical hardening on the basis of calcium hydroxide. It is used as medical liner for all filling

materials. It also can be used for direct and indirect dental pulp covering.

Septocalcine Ultra (Septodont) – it is used as medical liner on the basis of calcium hydroxide of chemical hardening.

Urbikal (Keer) – is a self-hardening material which is used for indirect dental pulp covering when deep caries treatment. It has high concentration of calcium hydroxide – 11,5.

Calcimol LC (Voco) – is a light-hardening material for medical liners. It is used for composite materials of light polymerization.

Reocap (Vivadent) – is a calcium containing cement. It is used as insulating liners for fillings of all kinds. It is used as medical liner for indirect dental pulp covering.

Calcevit (VladMiva) – a lining ca-containing material. It is used as medical liner when deep caries treatment and reversible forms of pulpitis. It is used for direct and indirect dental pulp covering.

Calcecil LC (VladMiva) - is a light-hardening ca-containing material on the basis of calcium hydroxide.

Calcicur (Voco) – is a paste on the basis of 45% calcium hydroxide. It is used for direct dental pulp covering. It is also can be used for temporary root canals obturation.

PULPITIS

Pulpitis is dental pulp inflammation that arises from irritants penetrating to pulp and which cause irreversible changes in pulp.

Pulpitis classification

According to Gophung Y.M. (1924):

1. Acute pulpitis:
 - partial;
 - general;
 - suppurative pulpitis.
2. Chronic pulpitis:
 - simple;
 - hypertrophic;
 - gangrenous.

According to Platonov Y.Y. (1968)

1. Acute pulpitis:
 - focal;
 - diffuse.
2. Chronic pulpitis:
 - fibrous;
 - gangrenous;
 - hypertrophic.
3. Chronic pulpitic exacerbation.

Working pulpitis classification of Preventive Dentistry Propedeutics
Department of UMDA (Poltava):

I. Acute pulpitis:

- Traumatic:
(when carious cavity preparation with or without dental pulp uncovering);
(fracture of crown of the tooth or root of the tooth);

- Dental pulp hyperemia;
- Partial pulpitis;
- General pulpitis;
- Suppurative pulpitis.

II. Chronic pulpitis:

- Simple pulpitis;
- Hypertrophic pulpitis;
- Gangrenous pulpitis;
- Concrementous pulpitis;
- Root pulpitis.

III. Exacerbation of chronic pulpitis.

IV. Pulpitis complicated with periodontitis.

V. Necrosis and gangrene of dental pulp.

VI. Atrophy of dental pulp.

Classification of pulpitis IDC -10 according to WHO (1998)

K04 Pulp and periapical tissues diseases.

K04.0 Pulpitis

K04.1 Pulp necrosis

K04.2 Pulp degeneration

K04.3 Irregular forming of pulp hard tissues

K04.4 Acute apical periodontitis of pulpal origin

CLINICAL PICTURE OF PULPITIS

Hyperaemia of dental pulp

Complaints: acute spontaneous fulminant pain in a tooth of upper (lower) jaw from the right (left) side. Pain is present for 1-2 minutes and appears 1 or 2 times per day. The painless period lasts from 6 to 24 hours. There is also tooth pain caused by chemical (sweet food) or thermal (cold water) irritants. This pain lasts 1-2 minutes after the irritants are gone.

Medical history (according to patient's words): The tooth hasn't been treated yet. The patient can point the tooth which is in pain. There is a complaint for short term pain in this tooth caused by thermal or chemical irritants in the past. The pain disappeared as the irritants were gone. The spontaneous pain appeared around 24 hours ago.

Objective patient examination: There is a carious cavity in the tooth. The cavity has narrow inlet within the bounds of parapulpal dentin. The enamel edges are fragile of chalky white color, sapped. Cavity floor and walls dentin is grey or light yellow. It can be easily removed by layers. *Probing* of carious cavity walls is painless, probing of carious cavity floor is sensitive and painful in projection of dental pulp corn. *Palpation* is painless in projection of causal tooth root apex, *percussion* is painless too. *Thermodiagnosis* is painful, cold irritant causes pain which lasts 1-2 minutes. EOD is 10-15 microampere.

X-Ray Diagnosing: there is deep carious cavity within the bounds of parapulpal dentin. The cavity has no connection with dental cavity. There are no changes in periodont tissues.

Acute partial pulpitis

Complaints: acute spontaneous colicky pain in a tooth. Pain is present for 2-7 minutes, often it is 10-30 minutes. The painless period lasts from 4-5 to 6-8 hours. There is also spontaneous colicky tooth pain at night time and also pain caused by irritants of different kinds (cold, sweet food). This pain lasts 30 minutes after the irritants are gone.

Medical history (according to patient's words): The tooth hasn't been treated yet. The patient can point the tooth which is in pain. There is a complaint for pain in this tooth caused by thermal or chemical irritants in the past. The pain disappeared as the irritants were gone. The spontaneous pain of fulminant character has appeared later. Now the pain lasts 2 days.

Objective patient examination: There is deep carious cavity in the tooth. The cavity has narrow inlet within the bounds of parapulpal dentin. The enamel edges are fragile of chalky white color, sapped. Cavity floor and walls dentin is grey or light yellow. It is soft and can be easily removed by layers. Sometimes dentin can be dense, pigmented on carious cavity walls but soft on carious cavity floor. *Probing* of carious cavity walls is painless, probing of carious cavity floor is sensitive in projection of dental pulp corn, the pain lasts for some time. *Palpation* is painless in projection of causal tooth root apex, *percussion* is painless too. *Thermodiagnosis* is sharply painful from thermal irritants, the pain lasts for long time after the irritants are gone. EOD is 20-25 microampere, it also can be 8-10 microampere (if tooth EOD measurement is implemented on masticatory dental tubercle over pulp corn which is not involved in inflammatory process).

Acute general (diffuse) pulpitis

Complaints: acute spontaneous colicky pain in a tooth in upper (lower) jaw. Pain kicks to ear, back of the head, submaxillary area if the causal tooth is in lower jaw, and to temple, ear, infraorbital area if the causal tooth is in upper jaw. Pain is present for hours. The painless period lasts 30-40 minutes and it becomes shorter. The pain becomes stronger in the night time, when in bed and from all types of irritants. The pain lasts for long time after the irritants are gone.

Medical history: The tooth hasn't been treated yet. The acute spontaneous short term pain appeared 3 days ago (it lasted 30-40 minutes). The pain became stronger and almost constant within the last 24 hours.

Objective patient examination: There is deep carious cavity in the tooth. The cavity has narrow inlet within the bounds of parapulpal dentin. Cavity floor and walls dentin is grey. It is soft and can be easily removed by layers. *Probing* of carious cavity walls is painless, probing of carious cavity floor is sharply painful, the pain lasts for some time after the probing is finished. *Palpation* is painless on transitional fold in projection of causal tooth root apex, *percussion* (comparative) is sensitive. *Thermodiagnosis* is painful, the pain lasts for long time, irradiation of pain on branches of trigeminal nerve. EOD is 20-35 microampere.

X-Ray Diagnosing: There are no changes in periodont tissues.

Acute suppurative pulpitis

Complaints: acute, continuous, spontaneous, pulsing, tearing pain with short light periods. Sometimes pain does not disappear but calms a little and the pain intensity falls down. Pain becomes stronger at night time, it kicks to ear, back of the head, submaxillary area, and to temple, ear, infraorbital area. Throes become stronger when taking warm water and food and relief comes after cold water taking. That kind of patients often come with a bottle of cold water as keeping of some cold water in a mouth helps to reduce pain. The pain becomes stronger from chemical and mechanical irritants, it lasts for long time after the irritants are gone.

Medical history: The tooth hasn't been treated yet. The spontaneous pain appeared 3 days ago. Pain intensity was increasing step by step. The pain became stronger and almost constant within the last 24 hours.

Objective patient examination: There is deep carious cavity in the tooth. The cavity has narrow inlet within the bounds of parapulpal dentin. Cavity floor and walls dentin is grey. It is soft and can be easily removed by layers. *Probing* of carious cavity walls is painless, probing of carious cavity floor is sharply painful (sometimes it is possible to perforate carious cavity floor with the probe. In this case there is some serous exudates or purulent effluent appear from pulpar chamber. The patient feels relief). Further probing is painless but it can be sensitive in the depth of pulpar chamber near tooth root canal orifice. *Palpation* of tunica mucosa of mouth is painless on transitional fold in projection of causal tooth root apex, *vertical percussion* is sensitive (at the expense of perifocal inflammatory reaction of periodont tissues). *Thermodiagnosis*

is painful for warm water, the pain becomes stronger, it is gone from cold water for 3-5 minutes. EOD is 40-60 microampere.

X-Ray Diagnosing: There are no changes in periodont tissues. The periodontal fissure integrity is not disturbed.

**Acute traumatic pulpitis
(domestic, sport accident)**

Complaints: acute, sharp pain in a tooth that appeared right after injury. There is a split of crown of a tooth. The pain is not acute but it is spontaneous and appears from all kinds of irritants (sweet, salty food, mechanical irritants – tooth touching).

Medical history: According to the patient's words the injury was received 1-2 hours ago as a result of falling down (hockey stick or puck kick).

Objective patient examination: The integrity of crown of a tooth is disturbed. The crown split is at the level of tooth equator (dental cervix, split along vertical tooth axis, split of crown of a tooth corner is 2/3-1/2). There is bare dental pulp in the area of crown split. The dental pulp may bleed. *Probing* is sharply painful. *Palpation* is painless on transitional fold in projection of causal tooth root apex from the side of vestibule of mouth. *Percussion* is painful. *Thermodiagnosis* is sharply painful, there is strong pain attack when some water comes to bare dental pulp. EOD is 15-17 microampere. If the injury is with dental pulp rupture EOD is 100 microampere.

X-Ray Diagnosing: There are no changes in periodont tissues. Root apex integrity disturbance is possible – the fracture line is visible (displaced or not), root circuit and root canal integrity disturbance.

Acute traumatic pulpitis

(accidental pulp opening when preparation)

Complaints: acute, sharp pain in a tooth, pain from thermal and mechanical irritants.

Medical history: the injury was received during preparation of carious cavity at the stage of acute (chronic) deep caries treatment.

Objective patient examination: There is prepared carious cavity within the bounds of parapulpal dentin. There is bleeding area of open corn (cheek, lingual) of dental pulp on the carious cavity floor. *Probing* is sharply painful in the area of open corn and it may cause bleeding. *Palpation* and percussion are painless. *Thermodiagnosis* is painful, there is strong pain attack. EOD is 15-17 microampere.

X-Ray Diagnosing: There are no changes in periodont tissues. The periodontal fissure integrity is not disturbed. There is carious cavity which is connected with pulp chamber in the area of medial (distal) corn of dental pulp.

Chronic simple (fibrous) pulpitis

which takes place when the pulp chamber is open

Complaints: boring pain which appears from mechanical (rough food chewing), thermal (cold water) and chemical irritants. The pain attack comes after cold water taking and slowly increases, it lasts for 15-20 minutes. Sometimes pain appears when «suctioning» from the tooth and it goes away quickly. There is constant heavy feeling in the tooth.

Medical history: The patient noticed acute spontaneous tooth pain around 7 months ago. The tooth hasn't been treated yet. Then acute spontaneous pain disappeared and the pain became causal and long

lasting.

Objective patient examination: the examination discovered that the crown of the tooth has changed its color (dull, grey). There is deep carious cavity with wide inlet, the cavity floor is within the bounds of parapulpal dentin. Carious cavity walls dentin is dense and pigmented, it is soft on the floor. When *probing* there is a connection between carious cavity and pulp chamber discovered. The probing is sharply painful in the place of connection, dental pulp is bleeding. *Palpation* of tunica mucosa of mouth from the side of oral cavity vestibule in the projection of causal tooth root apex is painless. *Percussion* of causal tooth is sensitive compared to contiguous teeth but painless. *Thermodiagnosis* is painful from cold water, the pain appears slowly, it becomes stronger step by step, and goes away slowly after the irritant is gone. EOD is 30-35 microampere.

X-Ray Diagnosing: there is slight dilatation of periodontal fissure, its circuit is damaged. There is a connection between carious cavity and pulp chamber in the area of dental pulp corn.

Chronic simple (fibrous) pulpitis with closed pulp chamber

Complaints: boring, pulling tooth pain caused by mechanical irritants (when coarse food chewing), and boring pain when cold water taking. The pain lasts for long time after the irritants are gone. There is pain which caused by temperature change (when coming into warm room from cold air). There is also dull pain when cold air breathing in. This pain lasts for long time. There is a carious cavity in a tooth, food gets stuck in carious cavity, heavy feeling in a tooth.

Medical history: the tooth hasn't been treated yet. The patient

noticed acute spontaneous pain approximately 7 months ago. The pain intensity decreased step by step and the pain was caused only by irritants (mechanical and thermal ones) and environment temperature change.

Objective patient examination: there is deep carious cavity in a tooth with wide inlet in the area of parapulpal dentin. Carious cavity walls dentin is pigmented, it is dense when probing. Carious cavity floor dentin is slightly soft. *Probing* of carious cavity floor is sensitive (sometimes painful). *Palpation* is painless. *Percussion* (comparative) is painless. *Thermodiagnosis* is painful for cold water. There is pain attack which doesn't go away quickly. EOD is 30-35 microampere.

X-Ray Diagnosing: there is slight dilatation of periodontal fissure in the area of root apex, carious cavity which does not connect with pulp chamber.

Chronic gangrenous pulpitis.

Complaints: boring tooth pain caused by hot food taking, it lasts for long time. There is carious cavity in a tooth, food gets stuck in the carious cavity. There is also bad breath. There is constant spreading feeling in a tooth, feeling of heaviness and discomfort.

Medical history: The tooth hasn't been treated yet (based on patient's words). The carious cavity appeared around 1 year ago. Then the patient felt strong spontaneous pain which stopped later.

Objective patient examination: The tooth is grey. There is deep carious cavity within the bounds of parapulpal dentin. Cavity floor and walls dentin is pigmented. *Probing*: carious cavity walls and floor dentin is soft. Carious cavity has a connection with dental cavity. Pulp chamber is wide open and full with decayed coronal pulp of grey color with

unpleasant odor. *Probing* (superficial) is painless, of tooth root canal orifice (deep probing) is sharply painful. The pain goes away quickly, root part of the pulp is slightly bleeding. *Palpation* in projection of causal tooth root apex is painless. Percussion is painless too. *Thermodiagnosis* is painful for warm irritant, the pain becomes stronger step by step. EOD is 40-60 microampere, sometimes 80-90 microampere.

X-Ray Diagnosing: There is periodontal fissure widening and slight bone resorption with fuzzy contour in periapical tissues. The carious cavity is widely connected with dental cavity.

Chronic hypertrophic pulpitis

Complaints: slight bleeding and boring pain when rough food chewing. Boring pain caused by thermal irritants which lasts for long time even after the irritants are gone. There is ruined tooth and «wild meat» enlargement in the carious cavity. There is also slight pain when sucking off the tooth.

Medical history: (based on patient's words) there was sharp spontaneous pain in the tooth around 9-10 months ago. The tooth hasn't been treated yet. The pain attacks were gone. The pain used to arise only from different types of irritants and it lasted for long time even after the irritants were gone.

Objective patient examination: The crown of a tooth is ruined for 1/2. The carious cavity is connected with dental cavity and full with enlarged dental pulp of red and pink color (the size of millet, wheat or pea granule is possible). *Probing:* dentin is dense, the probe goes around the enlargement. There are no interdental papilla enlargement. The pulp

enlargement probing is painful, the pain disappears quickly. The pulp is bleeding. *Palpation* in projection of causal tooth root apex is painless. Percussion is painless too. *Thermodiagnosis* is painful, this pain is not sharp and it disappears as the irritants are gone. EOD is 30-40 microampere (this data should be taken from masticatory tuber remained).

X-Ray Diagnosing: There are no changes in periapical tissues. The carious cavity is connected with dental cavity. There is slight periodontal fissure widening near the root apex.

Chronic concrementous pulpitis

Complaints: sharp and spontaneous pain which becomes stronger step by step. It is attack-like and spreading pain. Sometimes it can be night time long-lasting pain, it can be caused by thermal irritants.

Sometimes the patient can notice spontaneous tooth pain which is caused by abrupt movement down (going down the steps or in elevator), bending forward, turning around and jumping.

Medical history: (based on patient's words) The tooth hasn't been treated yet. The first pain attack appeared approximately one year ago.

Objective patient examination: The occlusal surfaces are effaced. *Probing:* slightly sensitive in causal tooth, the unpleasant feeling goes away quickly. The palpation is painless. Percussion is slightly sensitive compared to near standing teeth and it can provoke spontaneous pain. *Thermodiagnosis* is sensitive, this pain disappears as the irritants are gone. EOD is 30-40 microampere, sometimes it can be 2-6 microampere.

X-Ray Diagnosing: There are no changes in periodontal tissues.

There are denticles of different size (free-located and parietal) in dental cavity. Sometimes there is pulp chamber obliteration and narrow of root canals.

Chronic root pulpitis

Complaints: sharp and spontaneous pain which becomes stronger from thermal irritants (especially hot water – 37C and up). It is attack-like and spreading pain.

Medical history: (based on patient's words) The tooth was treated for acute pulpitis 2 months ago. The first pain attack appeared approximately 3 days ago and becomes worth.

Objective patient examination: there is a composite filling on masticatory surface of the tooth. Filling integrity is not disturbed (or it is disturbed and the filling is movable). After the filling removing: there is deep carious cavity in the tooth which is connected with dental cavity. There are tooth root canal orifices on the pulp chamber floor. Superficial probing of tooth root canal orifices is painless. After root canals revision – deep probing of root canal is sharply painful. Palpation of mucous tunic in projection of root apex is painless. Percussion is sensitive or painful. Thermodiagnosis is painful if the temperature is more than 37C, pain disappears if the irritant is colder. EOD is 60-90 microampere.

X-Ray diagnosing: there is a filling in the tooth. The root canals are unfilled for ½ and 2/3 of its length. There is widening in periapical fissure in the area of unfilled root canal apex from the side of periodont tissues.

Exacerbation of chronic simple (fibrous) pulpitis

Complaints: boring, spontaneous, spreading, attack-like pain

which becomes stronger from chemical and temperature irritants. There is boring pain from cold water taking that usually appears in the evening or at night time. Painless periods are short. The patient complains for carious cavity in a tooth and some food remaining in it.

Medical history: the tooth hasn't been treated yet. There was sharp spontaneous pain around 7-8 months ago. These pain attacks are not for the first time. The pain had lasted for 2 days before the patient went to see the dentist. The pain becomes stronger.

Objective patient examination: there is deep carious cavity in a tooth within the bounds of parapulpal dentin which does not connect with pulp chamber. Carious cavity floor and walls dentin is pigmented, it is slightly soft in projection of dental pulp corn. Palpation in projection of dental pulp corn on transitional fold is painless. Percussion is slightly painful. Thermodiagnosis is sensitive, there is long pain attack from cold water, the pain doesn't disappear after the irritant is gone. EOD is 35-45 microampere, but it also can be 60-80 microampere.

X-Ray Diagnosing: there is widening of periodontal fissure at root apex in periapical tissues. Sometimes it is possible to notice the carious cavity connection with dental cavity.

Exacerbation of chronic gangrenous pulpitis

Complaints: spontaneous boring long term attack-like pain with short painless periods. It can become easier but then it becomes stronger wavelike. Sometimes pain appears when biting. There is a cavity in the tooth and some food in it. The tooth hurts from hot food, the pain becomes weaker when taking some cold food but it doesn't disappear when the irritants are gone. There is also a bad breath.

Medical history: The tooth hasn't been treated yet. There is pain from hot food, spreading feeling in the tooth, unpleasant odor when suctioning from the tooth for 6-7 months. The pain becomes stronger not for the first time. The pain is present for 2-3 days.

Objective patient examination: The tooth is grey. There is deep carious cavity which has a connection with dental cavity. Cavity floor and walls dentin is dense when probing, the tooth pulp is grey. The superficial *Probing* is painless. There is putrefactive odor from the tooth. Deep probing in tooth root canal orifices is painful. There is hyperaemia of mucous tunic (positive symptom of vasoparesis) from the side of vestibule of mouth in projection of root apex. Percussion is painful (compared vertical). *Thermodiagnosis* is painful for cold water. EOD is 60-90 microampere.

X-Ray Diagnosing: There are changes of periodont tissues as widening of periapical fissure. Sometimes it may be bone tissue resorption at root apex with undefined bounds. The carious cavity is within the bounds of parapulpal dentin and is connected with dental cavity.

Pulpitis complicated by periodontitis (as perifocal inflammation)

Complaints: sharp spontaneous throbbing spreading night time pain which becomes stronger from different irritants. The pain is increasing, it becomes stronger when biting. The pain is almost constant with short painless periods.

Medical history: The tooth hasn't been treated yet. Sharp spontaneous pain appeared a day ago. This pain became stronger step by

step. There was also painful biting.

Objective patient examination: The face is symmetrical. Palpation: regional lymph nodes are enlarged, painful, movable, not united with other surrounding tissues. Palpation of mucous tunic from the side of vestibule of mouth on transitional fold in projection of root apex is painful, mucous tunic is edematic and hyperemic. The transitional fold is smoothed, there is positive symptom of vasoparesis. There is deep carious cavity in a causal tooth. The cavity is within the bounds of parapulpal dentin and it has no connection with pulp chamber. Floor and walls dentin is soft. There is sharp pain all over the floor when carious cavity floor probing. When pulp chamber is perforated there is serous bloody purulent exudate, the pulp is sharply painful and it is bleeding when probing. Percussion is sharply painful. *Thermodiagnosis* is painful, pain becomes stronger from cold and warm irritants, it lasts for long time after the irritants are gone. EOD is 80-100 microampere.

X-Ray Diagnosing: There is widening of periodont fissure at root apex from the side of periapical tissues. There is carious cavity within the bounds of parapulpal dentin, the cavity has no connection with dental cavity.

Pulpitis complicated with periodontitis (as periodontitis exacerbation)

Complaints: soft-tissue swelling, spontaneous night time throbbing spreading pain, sharp pain when biting. There is general condition deterioration, weakness, head ache, indisposition, body temperature is 37C.

Medical history: The tooth hasn't been treated yet. There have been often pain attacks for 6-8 months but the patient hasn't asked for medical help.

Objective patient examination: The face is asymmetrical as there is soft tissue swelling. Regional lymph nodes are enlarged from the side of causal tooth, painful when palpation, movable, not united with other surrounding tissues. The transitional fold is smoothed, edematic and hyperemic from the vestibule of mouth side, it is painful when palapation, there is positive symptom of vasoparesis. There is deep carious cavity in a causal tooth. The cavity is within the bounds of parapulpar dentin and it has no connection with pulp chamber. Probing: floor dentin is slightly soft and walls dentin is dense. There is sharp pain all over the floor when carious cavity floor probing. When carious cavity floor is perforated there is serous bloody exudate, the pulp is sharply painful and it is bleeding when probing. EOD is 60-100 microampere. *Thermodiagnosis* is painful, pain becomes stronger from cold and warm irritants, it lasts for long time after the irritants are gone.

X-Ray Diagnosing: There is widening and deformation of periodont fissure from the side of periodont tissues. There is deep carious cavity within the bounds of parapulpar dentin, the cavity has no connection with dental cavity.

PULPITIS TREATMENT

TREATMENT RECORD

Reference number IDC K.04.00 – Initial pulpitis (hyperaemia)

Clinical form – acute pulpitis, pulp hyperaemia

Treatment:

Local:

Bioassay (conservative) method of pulpitis treatment:

I patient's visit

- Antiseptic treatment of oral cavity;
- Anesthetic treatment (infiltrate, field);
- Preparation of carious cavity;
- Carious cavity antiseptic treatment with warm (of 36C-37C) 0,02% furaciline solution, microcid solution, 0,5% etony solution, 0,01% chlorhexidine bigluconate solution and other non-irritating antimicrobial agents;
- The dental treatment paste is put on the floor of carious cavity (if there is open pulp corn it is possible to set cotton pellet moistened with some drugs instead of dental treatment paste);
- The calcium hydroxide pastes are mostly used. It is also possible to use other therapeutic agents: antibiotics and its combinations, combination of sulfonamides and antibiotics, corticosteroids, calcium containing agents, ferment agents, agents of nitrofurans row, glycosaminoglycans etc.;
- Filling of the carious cavity with temporary filling material.

II patient's visit

- If there is even slight pain feeling, high reaction on thermal irritators, percussion and increasing of pulp electroexcitability or if there is one of these symptoms the treatment session is repeated;

- The conservative treatment has to be changed for surgical method (amputation or extirpation) if the results of treatment are not satisfying in 5-7 days, or there is increasing inflammation process;

- If there is no pain reaction the further treatment is proceeded;

- Antiseptic treatment of oral cavity;

- In case if dental treatment paste is used with corticosteroids it should be carefully replaced by calcium hydroxide containing agents with direct or indirect pulp covering;

- Insulating liner (do not use zinc phosphate cement!);

- Carious cavity filling. If it is necessary – restoration of crown of tooth with cements, compomers, composite materials, silver amalgam etc depending on topographic and anatomic peculiarities of the tooth. It is possible to make prolonged filling when the cavity is closed with temporary filling with GIC.

TREATMENT RECORD

Reference number IDC K.04.01 - Acute pulpitis

Clinical form – acute limited pulpitis

Treatment:

Local: choice of pulpitis treatment method depends on several factors.

Bioassay (conservative) method of pulpitis treatment:

Is used if disease lasts less than 1 day;

if carious cavity is on masticatory contact surface (above tooth equator),

if the patient is almost healthy young person,

if there is compensated or subcompensated caries.

The acute limited pulpitis treatment is conducted according to treatment record of tooth pulp hyperaemia by bioassay method.

Pulp amputation (vital or devital).

It is used if the patient is young and the bioassay method is not effective; also if there is carious cavity of II class according to Black in masticatory tooth.

Pulp extirpation (vital or devital)

It is used if the vital amputation method is not effective, if there is carious cavity of II-V classes according to Black, when treatment of frontal (one-root) teeth.

Devital methods of treatment are used when there are local anesthesia contraindications.

Pulp amputation.

a) Vital amputation:

- Antiseptic treatment of oral cavity;
- Anesthetic treatment (infiltrate, field);
- Carious cavity preparation taking into account topographic and anatomic peculiarities of the tooth;

- Dental cavity opening;
- Coronal pulp removal (pulpotomy);
- Medical treatment of pulp stump with warm (of 36C-37C) 0,02% furaciline solution, microcid solution, 0,5% etony solution, 0,01% chlorhexidine bigluconate solution and other non-irritating antimicrobial agents;
- Stop the pulp stump bleeding;
- Put the dental treatment paste on pulp stump. It is recommended to use anti-inflammatory and odontotropic pastes and agents based on calcium hydroxide;
- Insulating liner (do not use zinc phosphate cement!);
- Carious cavity filling. If it is necessary – restoration of crown of tooth with cements, compomers, composite materials, silver amalgam etc depending on topographic and anatomic peculiarities of the tooth. It is possible to make prolonged filling when the cavity is closed with temporary filling with GIC.

b) Devital amputation:

I patient's visit

- Antiseptic treatment of oral cavity;
- Carious cavity preparation (opening and partial necrotomy of carious cavity) taking into account topographic and anatomic peculiarities of the tooth;
- Pulp corn opening;
- Devitalizing paste input (arsenious containing, paraformaldehyde etc.);

- Carious cavity closing with occlusive dressing.

II patient's visit

- Antiseptic treatment of oral cavity;
- Occlusive dressing removing and full carious cavity opening;
- Dental cavity opening;
- Coronal pulp removal (pulpotomy). The tooth canal orifice opening and pulp resection from tooth canal orifice with the help of spear-shaped bur or Gates-Glidden bur are possible;
- Medical treatment of pulp stump with furaciline solution, 1% chlorhexidine solution and other;
- Stop the pulp stump bleeding;
- Put the dental treatment paste on pulp stump. It is recommended to use mummifying pastes;
- Insulating liner;
- Carious cavity filling.

Extirpation of pulp

a) Vital extirpation:

- Antiseptic treatment of oral cavity;
- Anesthetic treatment (infiltrate, field);
- Carious cavity preparation taking into account topographic and anatomic peculiarities of the tooth;
- Dental cavity opening;
- Coronal pulp removal (pulpotomy);
- Medical treatment of pulp stump;
- Stop the pulp stump bleeding;

- The tooth canal orifices opening;
- Root pulp extirpation (pulpectomy);
- Stop root canal bleeding;
- Tools and medical treatment of root canal(-s) of the whole length with using of endodontic tools of appropriate size;
- For medical treatment of root canals it is recommended to use non-irritating periodontium and fast-acting medical agents: antiseptic solutions: halogens and oxidizers (1% sodium hydrochloride, 1% chlorhexidine solution, 1% iodinol solution, 3% hydrogen peroxide solution etc.); quaternary ammonium compounds (0,5%-1% etoniy solution, 1% chloride benzalcone solution, 0,15% decamethoxine solution); phenol compounds (5% phenol solution, 1% camphor-paramonochlorophenol solution and its composite preparations), nitrofurans, antimicrobial agents etc.;
- Root canal(-s) filling with material for root filling within the bounds of root apex opening;
- Carious cavity filling.

b) Devital extirpation:

I patient's visit

- Antiseptic treatment of oral cavity;
- Carious cavity preparation (opening and partial necrotomy of carious cavity) taking into account topographic and anatomic peculiarities of the tooth;
- Pulp corn opening;
- Devitalizing paste input (arsenious, paraformaldehyde etc.);
- Carious cavity closing with occlusive dressing.

II patient's visit

- Antiseptic treatment of oral cavity;
- Carious cavity preparation taking into account topographic and anatomic peculiarities of the tooth;
- Dental cavity opening;
- Coronal pulp removal (pulpotomy);
- Medical treatment of pulp stump;
- Stop the pulp stump bleeding;
- The tooth canal orifices opening;
- Root pulp extirpation (pulpectomy);
- Stop root canal bleeding;
- Tools and medical treatment of root canal(-s) of the whole length with using of endodontic tools of appropriate size;
- For medical treatment of root canals it is recommended to use non-irritating periodontium and fast-acting medical agents: antiseptic solutions: halogens and oxidizers (1% sodium hydrochloride, 1% chlorhexidine solution, 1% iodinol solution, 3% hydrogen peroxide solution etc.); quaternary ammonium compounds (0,5%-1% etoniy solution, 1% chloride benzalcone solution, 0,15% decamethoxine solution); phenol compounds (5% phenol solution, 1% camphor-paramonochlorophenol solution and its composite preparations), nitrofurans, antimicrobial agents etc.;
- Root canal(-s) filling with material for root filling within the bounds of root apex opening;
- Carious cavity filling. . If it is necessary – restoration of crown of tooth with cements, compomers, composite materials, silver amalgam

etc depending on topographic and anatomic peculiarities of the tooth. It is possible to make prolonged filling when the cavity is closed with temporary filling.

TREATMENT RECORD

Reference number IDC K.04.01 - Acute pulpitis

Clinical form – acute diffuse pulpitis

Treatment: is conducted by method of vital and devital extirpation (see treatment record for acute limited pulpitis).

TREATMENT RECORD

Reference number IDC K.04.02 – Suppurative pulpal abscess

Clinical form – acute suppurative pulpitis

Treatment:

Local:

Pulp extirpation.

a) Vital extirpation:

This is realized according to treatment record for acute limited pulpitis.

b) Devital extirpation:

I patient's visit

- Antiseptic treatment of oral cavity;
- Carious cavity preparation (opening and partial necrotomy of carious cavity) taking into account topographic and anatomic peculiarities of the tooth;

- Making conditions for purulent effluent outflow (dental cavity opening);
- Devitalizing paste input (arsenious, paraformaldehyde etc.);
- Carious cavity closing with occlusive dressing.

II patient's visit

This is conducted according to treatment record for acute limited pulpitis (using method of devital extirpation – II visit).

TREATMENT RECORD

Reference number IDC K.04.01 - Acute pulpitis

Clinical form – acute traumatic pulpitis

Treatment:

Local: choice of pulpitis treatment method depends on several factors.

Bioassay (conservative) method of pulpitis treatment:

Is used if there is accidentally bared pulp section. But this method usage depends whether the carious cavity is on masticatory contact surface (above tooth equator) or not, if the patient is almost healthy young person, if there is compensated or subcompensated caries. The method cannot be used when treating the frontal one-root teeth where we use pulp extirpation method (if the pulp is accidentally bared).

Pulp amputation (vital).

This is choice method when there is accidental pulp injury at molars and premolars. But this method usage depends whether the carious cavity is on masticatory contact surface (above tooth equator) or not, if the patient is almost healthy young person, if there is

compensated or subcompensated caries. In case of frontal one-root teeth treatment if there is accidental injured pulp we use pulp extirpation method. The amputation is also used if the patient is young and the bioassay method is useless when accidentally bared pulp treatment. It is recommended to use pulp extirpation on masticatory teeth if there is a carious cavity of II class according to Black in case of accidentally injured pulp below the equator level.

Pulp extirpation (vital or devital).

This is the choice method for bared pulp treatment when the crown of a tooth is broken. It is used if the vital amputation method is not effective, if there is carious cavity of II-V classes according to Black, when acute traumatic pulpitis treatment of frontal (one-root) teeth.

Devital extirpation is used when there are local anesthesia contraindications.

The treatment records of methods can be seen above.

TREATMENT RECORD

Reference number IDC K.04.03 - Chronic pulpitis

Clinical form – chronic fibrous pulpitis

Treatment:

Local:

Pulp extirpation.

- a) Vital extirpation;
- b) Devital extirpation.

The treatment records of methods can be seen above.

TREATMENT RECORD

Reference number IDC K.04.05 - Chronic hyperplastic pulpitis

(pulpal polyp)

Clinical form – chronic hypertrophic pulpitis

Treatment:

Local:

Pulp extirpation.

- a) Vital extirpation;
- b) Devital extirpation.

The treatment records of methods can be seen above.

TREATMENT RECORD

Reference number IDC K.04.03 - Chronic pulpitis

Clinical form – chronic gangrenous pulpitis

Treatment:

Local:

Pulp extirpation.

- a) Vital extirpation;
- b) Devital extirpation.

The treatment records of methods can be seen above.

TREATMENT RECORD

Reference number IDC K.04.05 - Chronic pulpitis

Clinical form – pulpitis complicated with periodontitis

Treatment:

Local:

Pulp extirpation.

a) Vital extirpation;

I patient's visit

- Antiseptic treatment of oral cavity;
- Anesthetic treatment (infiltrate, field);
- Carious cavity preparation taking into account topographic and anatomic peculiarities of the tooth;
- Dental cavity opening;
- Coronal pulp removal (pulpotomy);
- Medical treatment of pulp stump;
- Stop the pulp stump bleeding;
- The tooth canal orifices opening;
- Root pulp extirpation (pulpectomy);
- Stop root canal bleeding;
- Tools and medical treatment of root canal(-s) of the whole length with using of endodontic tools of appropriate size;
- For medical treatment of root canals it is recommended to use non-irritating periodontium and fast-acting medical agents: antiseptic solutions: halogens and oxidizers (1% sodium hydrochloride, 1% chlorhexidine solution, 1% iodinol solution, 3% hydrogen peroxide

solution etc.); quaternary ammonium compounds (0,5%-1% etoniy solution, 1% chloride benzalcone solution, 0,15% decamethoxine solution); phenol compounds (5% phenol solution, 1% camphor-paramonochlorophenol solution and its composite preparations), nitrofurans, antimicrobial agents etc.;

- A turunda wet in appropriate medical agent is left in a canal;
- Carious cavity closing with half-hermetic or occlusive dressing (depending if there is or there is not slight quantity of serous exudates in a canal).

II patient's visit

- Antiseptic treatment of oral cavity (antiseptics mouth wash);
- If there is no pain – occlusive dressing removal;
- Root canal washing out and drying;
- Root canal(-s) filling with material for root filling within the bounds of root apex opening;
- Carious cavity filling.

MEDICAMENTAL AGENTS FOR TOOTH PULP ANESTHESIA

Lidokain based:

Xylestesin-a (3M/ESPE) – 2% solution (1,8 ml carpules), epinephrine containing in 1:80000 concentration.

Lignospan Special (Septodont) – 2% solution (1,8 ml carpules), epinephrine containing in 1:80000 concentration.

Lignospan (Septodont) – 2% solution (1,8 ml carpules), epinephrine containing in 1:100000 concentration.

Xylonor 2% noradrenaline (Septodont) – norepinephrine containing in 1:50000 concentration, (1,8 ml carpules).

Xylonor 2% sans vasoconstricteur (Septodont) – without vasoconstrictive agent, (1,8 ml carpules).

Mepivakain based:

Mepivastesin (3M/ESPE) – 3% solution without vasoconstrictive agent (1,8 ml carpules).

Scandonest 3% plain (Septodont) – without vasoconstrictive agent (1,8 ml carpules).

Scandonest 2% Special (Septodont) – epinephrine containing in 1:100000 concentration. (1,8 ml carpules).

Scandonest 2% noradrenalin (Septodont) – norepinephrine containing in 1:100000 concentration. (1,8 ml carpules).

Artikain based:

Ubistesin (3M/ESPE) – 4% solution, epinephrine containing in 1:200000 concentration. (1,7 ml carpules).

Ubistesin forte (3M/ESPE) – 4% solution, epinephrine containing in 1:100000 concentration. (1,7 ml carpules).

Septanest N (Septodont) – 4% solution, epinephrine containing in 1:200000 concentration. (1,7 ml carpules).

Septanest SP (Septodont) – 4% solution, epinephrine containing in 1:100000 concentration. (1,7 ml carpules).

Ultracain D-S (Hoechst) – 4% solution, epinephrine containing in 1:200000 concentration. (1,7 ml or 2 ml carpules).

Ultracain D-S forte (Hoechst) – 4% solution, epinephrine containing in 1:100000 concentration. (1,7 ml or 2 ml carpules).

Alphacain N (Dentsply) – 4% solution, epinephrine containing in 1:200000 concentration. (1,8 ml carpules).

Alphacain SP (Dentsply) – 4% solution, epinephrine containing in 1:100000 concentration. (1,8 ml carpules)

PREPARATIONS FOR TOOTH PULP DEVITALIZATION

Caustinerv (arsenical, rapid, fort) – arsenic based for tooth pulp devitalization. It has different terms of application depending of components concentration (3-10 days).

Depulpin (Voco) – does not contain arsenic, used for painless devitalization and mummification of tooth pulp and its remains.

Devit-A (VladMiva) – anesthetization paste. It is used for application anesthetization before dental cavity opening. It also has antiseptic effect.

Devit-P (VladMiva) – devitalization paste on the basis of paraformaldehyde, it is used for temporary (baby) teeth. It is applicated for 3-5 days.

Devit-C (VladMiva) – potent devitalization paste on the basis of paraformaldehyde, it is used for permanent teeth. It is applicated for 5-7 days.

Devital-forte (Tselil) – paraformaldehyde paste for tooth pulp devitalization.

PERIODONTITIS

Periodontitis is periodont tissues inflammation with involving of the surrounding tissues in this inflammation.

Periodontits classification

It is the classification of I.G.Lukomsky (1995) that is used in preventive dentistry clinic.

I. Acute periodontitis:

1. Serous;
2. Suppurative.

II. Chronic periodontitis:

1. Fibrous;
2. Granulomatous;
3. Granulating.

III. Chronic periodontitis exacerbation.

Periodontitis classification IDC-10 offered by WHO in 1998

K04 Pulp and periapical tissues diseases

K04.0 Pulpitis

K04.1 Pulp necrosis

K04.2 Pulp degeneration

K04.3 Wrong hard tissues forming in a pulp

K04.4 Acute apical periodontitis of pulpal origin

K04.5 Chronic apical periodontitis

K04.6 Periapical abscess with cavity

K04.7 Periapical abscess without cavity

K04.8 Root cyst

Excluded: side periodontal cyst (K09.0).

K04.9 Other and unspecified diseases of pulp and periapical tissues.

CLINICAL PICTURE OF PERIODONTITIS

Drug-induced periodontitis

Complaints: long-term boring tooth pain. The pain is localized, becomes slightly stronger when biting.

Medical history: The spontaneous night time pain appeared 5 days ago. The patient went to the doctor and received occlusive dressing with arsenious containing paste. The patient didn't show up for further treatment. The pain from biting appeared 1-2 days ago.

Objective patient examination: Patient's general condition is not disturbed. The face is symmetrical. Regional lymph nodes are not enlarged, painless when palpation (*sometimes they can be enlarged and painful*). Gum mucous tunic in the area of transitional fold in projection of tooth root apex is slightly pink, it is painless when palpation (it can be hyperemic and painful when palpation). There is an occlusive dressing or remains of filling material for temporary fillings and occlusive dressings in a tooth. After the occlusive dressing is removed there is deep carious cavity which is connected to dental cavity. *Probing* of carious cavity floor and dental cavity is painless. Vertical *percussion* is slightly painful. The tooth is slightly movable. *Thermodiagnosis* is painless. EOD is upper than 100 microampere.

X-Ray Diagnosing: There are no changes in periapical tissues. There is deep carious cavity which is connected with dental cavity.

Traumatic periodontitis (domestic accident, dislocation, hurt)

Complaints: long-term boring tooth pain. The pain becomes stronger when biting and touching the tooth. The patient can exactly show the causal tooth.

Medical history: (based on patient's words) trauma has been received during some sport exercises.

Objective patient examination: The face is symmetrical (sometimes there can be soft-tissue swelling, bruises). Regional lymph nodes are enlarged, slightly painful when palpation (*sometimes they can be without changes*). The mucous tunic in projection of tooth root apex is slightly pink, it is painless when palpation (it can be slightly hyperemic and painful when palpation). The tooth has changed its color (intact or with traumatic hard tissues injury). The tooth is slightly movable. *Probing* is painless. Percussion is painful. *Thermodiagnosis* is painless. EOD is 100 microampere (if there is neurovascular fascicle rupture).

X-Ray Diagnosing: There are no changes in periapical tissues.

Acute suppurative periodontitis

Complaints: sharp constant throbbing tearing tooth pain. There is a feeling of grown tooth, tooth moving. The pain kicks into ear, temple, submaxillary area. The pain becomes stronger when tooth touching. The face swelling is in accordance with side of causal tooth localization. There is a head ache for 1-3 days, body temperature increasing up to 37-38C, sleep disturbance, bad odor.

Medical history: The tooth hasn't been treated yet. The carious cavity appeared in a tooth long time ago. There used to be spontaneous pain but it has gone. The pain appeared 3-5 days ago. The patient did not visit the dentist.

Objective patient examination: The face is asymmetrical as there is colateral edema (the face can be symmetrical). The patient keeps his mouth open. Regional lymph nodes are enlarged, painless when palpation. There is bad odor. When vestibule on mouth examination: transitional fold in projection of tooth root apex is hyperemic, edematous, painful when palpation. The tooth is movable, there is a deep carious cavity in it (there also can be a filling), the carious cavity has no connection with dental cavity. *Probing* of carious cavity floor is painless. Percussion is sharply painful (vertical and horizontal). *Thermodiagnosis* is painless. EOD is upper than 100 microampere.

X-Ray Diagnosing: There are no changes in periapical tissues but it can be some loss of picture clearness of cancellous tissue.

Chronic fibrous periodontitis

Complaints: Crown of a tooth has changed its color. There is filling falling out. There is also a carious cavity. There is slight pain when rough food chewing and strong tooth pushing.

Medical history: The tooth has been treated already. There used to be some spontaneous pain. Sometimes there was pain when hot food taking. The patient took some pain killers but didn't go to see a doctor.

Objective patient examination: The face is symmetrical. Regional lymph nodes are not enlarged, painless when palpation. Gum mucous

tunic in the area of transitional fold in projection of tooth root apex is slightly pink, there are no changes in it. There is deep carious cavity (or filling) which is connected to dental cavity. *Probing* is painless (sometimes there can be some filling material remains in root canal orifices). Percussion is painless. Gum palpation in projection of tooth root apex is painless. *Thermodiagnosis* is painless. EOD is upper than 100 microampere.

X-Ray Diagnosing: There is uneven widening of periodontal fissure, its integrity is not disturbed. The compact alveole plate is preserved, sometimes it may be sclerosed. Tooth root apex is deformed, thickened because of hypercementosis. Sometimes filled root canals may be seen.

Chronic granulating periodontitis

Complaints: There is boring tooth pain, heavy spreading uncomfortable feeling in a tooth. The pain becomes stronger when biting and pushing on the tooth. There some complaints for gum reddening. There is also a fistula on mucous tunic of mouth in the area of causal tooth.

Medical history: (based on patient's words) The tooth hasn't been treated yet. The carious cavity appeared long time ago (more than 1 year ago).

Objective patient examination: The face is symmetrical. Regional lymph nodes are enlarged, painful when palpation. Transitional fold is edematous and hyperemic from the side of vestibule of mouth in projection of tooth root apex. Gum palpation causes unpleasant feelings,

pain. There is a fistula (which exudes purulent effluent or granulating enlargement) on the gum in the area of projection of tooth root apex or closer to alveolar ridge. There is deep carious cavity in the tooth which is connected to dental cavity. *Probing* is painless. Percussion is sensitive or slightly painful. Positive symptom of Lukomsky, Crone, Marmasse. *Thermodiagnosis* is painless. EOD is 100 microampere.

X-Ray Diagnosing: There is deep carious cavity which is connected with dental cavity. There is bone tissue resorption center with uneven flame tip like edges near the root apex. When the resorption is considerable there is root shortening because of tooth root cement resorption.

Chronic granulomatous periodontitis

Complaints: There is boring tooth pain. The pain becomes stronger when rough food chewing and biting. There is a thickening in projection of tooth root apex when pushing on a gum and there is also unpleasant boring feeling.

Medical history: (based on patient's words) The tooth has been treated already as spontaneous attack-like pain had appeared. There has been heavy feeling, aching pain and discomfort for this year.

Objective patient examination: The face is symmetrical. Regional lymph nodes are not enlarged, painless when palpation. When vestibule of mouth examination: the transitional fold and gum have no changes, the color is slightly pink. There is deep carious cavity in the tooth which is connected to dental cavity (there can be a filling or some filling material remains in a tooth or in tooth root orifices). *Probing* is painless.

Percussion is sensitive or painless. Gum palpation is painless. Positive symptom of Lukomsky, Shmreker, Marmasse. *Thermodiagnosis* is painless. EOD is upper than 100 microampere.

X-Ray Diagnosing: There is deep carious cavity which is connected with dental cavity. There is bone tissue destruction center up to 5mm diameter with even, fine, dense circuit near the tooth root apex. The integrity of cortical plate of alveoli is disturbed.

Chronic granulating periodontitis exacerbation

Complaints: There is constant boring tooth pain. Sometimes the pain kicks into the ear, temple, infraorbital region(depending on the causal tooth location). There is sharp pain when biting and even touching the tooth with the tongue, grown tooth feeling, surrounding soft tissues swelling, face asymmetry. There is also general condition deterioration, indisposition.

Medical history: (based on patient's words) The tooth has been treated already. The patient has such symptoms which go away by themselves for the last 12 months. The patient didn't go to see the doctor and didn't do self-treatment.

Objective patient examination: The face is asymmetrical because of colateral swelling of soft tissues in the area of upper (lower) jaw. Regional lymph nodes are enlarged, painful when palpation. When vestibule of mouth examination: the transitional fold in projection of tooth root apex is hyperemic and edematic. There is a sinus tract with purulent discharge. There is pain when palpation of tunica mucosa at transitional fold. There is deep carious cavity in the tooth which is

connected to dental cavity (there can be a filling or some filling material remains in a tooth). *Probing* of carious cavity and dental cavity is painless. Percussion is sharply painful. The tooth is slightly movable. Positive symptoms of Lukomsky, Marmasse. *Thermodiagnosis* is painless. EOD is upper than 100 microampere.

X-Ray Diagnosing: There is deep carious cavity which is connected with dental cavity. There is bone tissue destruction center with uneven flame tip like edges near the root apex. When the resorption is considerable there is root shortening because of tooth root cement resorption. The radiologic picture has fuzzy edges.

Exacerbation of chronic granulomatous periodontitis

Complaints: There is constant boring or sharp spontaneous tooth pain. Sometimes the pain kicks into the eye, temple, ear. There is sharp pain when biting and even touching the tooth with the tongue, grown tooth feeling, surrounding soft tissues swelling. There is also general condition deterioration, indisposition, head-ache, bad sleeping, body temperature increasing.

Medical history: (based on patient's words) The tooth has been treated already. The patient has such symptoms which go away by themselves for the last 12 months. The patient didn't go to see the doctor and didn't do self-treatment. He can also notice the lentil sized thickening at the tooth root apex which appeared around 7 months ago.

Objective patient examination: The face is asymmetrical because of colateral swelling of soft tissues. Regional lymph nodes are enlarged, painful when palpation. When vestibule of mouth examination: the

transitional fold and gum in projection of tooth root apex are hyperemic and edematic. Palpation is painful. There is induration of alveolar process mucous tunic at transitional fold. There is also a defect of a bone wall in the area of projection of tooth root apex. There is deep carious cavity in the tooth which is connected to dental cavity (there can be a filling or some filling material remains in a tooth or in tooth root orifices). *Probing* of carious cavity and dental cavity is painless. Percussion is sharply painful. Positive symptoms of Lukomsky, Shmreker, Marmasse. *Thermodiagnosis* is painless. EOD is upper than 100 microampere.

X-Ray Diagnosing: There is deep carious cavity which is connected with dental cavity. There is bone tissue destruction center up to 5mm diameter with even, fine, dense circuit near the tooth root apex. Granuloma is surrounded with osteoporosis area. The cortical plate of alveole is destroyed at this place. The radiologic picture has fuzzy edges.

PERIODONTITIS TREATMENT

TREATMENT RECORD

Reference number IDC K.04.4 – Acute apical periodontitis of a permanent tooth

Clinical form – acute serous periodontitis

Treatment:

The conservative treatment method is applied when there is no:

- Situation when causal tooth didn't cause acute septic condition, persistent infection and whole organism intoxication;
- Full crown destruction;
- Perforation of dental cavity floor.

Local:

I patient's visit

- Antiseptic treatment of oral cavity (mouth wash);
- Anesthetic treatment: local anesthetization, when there is sharp pain – field anesthetization;
- Carious cavity preparation taking into account topographic and anatomic peculiarities of the tooth;
- Dental cavity opening (using high-speed air-turbine handpiece);
- Phased evacuation of putrid degeneration from root canals under the antiseptic bath;
- Tools treatment of root canal(-s) of the whole length with using of endodontic tools of appropriate size;
- Opening of apical foramen for exudates outflow;
- Medical root canals treatment with antiseptic agents;

- There is a turunda wet in a chosen medical agent left in a canal;
- Carious cavity closing with half-hermetic or occlusive dressing (depending if there is or there is not slight quantity of serous exudates in a canal).

II patient's visit

- Antiseptic treatment of oral cavity (antiseptics mouth wash);
- Removal of occlusive (half-hermetic) dressing;
- Tools treatment of root canal(-s) of the whole length with using of endodontic files of appropriate size;
- For medical treatment of root canals it is recommended to use antiseptic, anti-inflammatory, non-irritating periodontium and fast-acting medical agents: antiseptic solutions: halogens and oxidizers (1% chlorhexidine solution, 1% iodinol solution, 3% hydrogen peroxide solution etc.); quaternary ammonium compounds (0,5%-1% etoniy solution, 1% chloride benzalcone solution, 0,15% decamethoxine solution); phenol compounds (5% phenol solution, 1% camphor-paramonochlorophenol solution and its composite preparations), nitrofurans, antimicrobial agents, sorbents, anti-inflammatory agents etc.;
- Root canal(-s) filling with material for root filling within the bounds of root apex opening;
- Carious cavity filling.

General treatment:

- Depending on patient's general condition the analgesics, antimicrobial and hyposensitization agents can be applied.

TREATMENT RECORD

Reference number IDC K.04.4 – Acute apical periodontitis of a permanent tooth

Clinical form – acute purulent periodontitis

Treatment:

Local:

I patient's visit

- Antiseptic treatment of oral cavity (mouth wash);
- Anesthetic treatment: local anesthetization, when there is sharp pain – field anesthetization;
- Carious cavity preparation taking into account topographic and anatomic peculiarities of the tooth;
- Dental cavity opening (using high-speed air-turbine handpiece);
- Phased evacuation of putrid degeneration from root canals under the antiseptic bath;
- Tools treatment of root canal(-s) of the whole length with using of endodontic tools of appropriate size;
- Opening of apical foramen for exudates outflow;
- Medical root canals treatment with antiseptic agents;
- Carious cavity closing with soft dressing (cotton pellet);
- Advising of often mouth washing with antiseptic solutions.

II patient's visit

- Antiseptic treatment of oral cavity (antiseptics mouth wash);
- Tools treatment of root canal(-s) of the whole length with using of endodontic tools of appropriate size;

- For medical treatment of root canals it is recommended to use antiseptic, anti-inflammatory agents (see above);
- There is a turunda wet in a chosen medical agent left in a canal;
- Carious cavity closing with half-hermetic or occlusive dressing (depending if there is or there is not slight quantity of serous exudates in a canal).

III patient's visit

- Antiseptic treatment of oral cavity (antiseptics mouth wash);
- half-hermetic or occlusive dressing removal;
- Root canal(-s) filling with material for root filling within the bounds of root apex opening (if there is no exudate);
- Carious cavity filling.

General treatment:

- Depending on patient's general condition the analgesics, antimicrobial and hyposensitization agents can be applied.

TREATMENT RECORD

Reference number IDC K.04.5 – Chronic apical periodontitis of a permanent tooth

Clinical form – chronic fibrous periodontitis, chronic granulating periodontitis, chronic granulomatous periodontitis.

Treatment:

Local:

I patient's visit

- Antiseptic treatment of oral cavity (mouth wash);

- Carious cavity preparation taking into account topographic and anatomic peculiarities of the tooth;
- Dental cavity and root canals orifice opening;
- Removing of putrid degeneration from root canals under the antiseptic bath;
- Tools treatment of root canal(-s) of the whole length with using of endodontic tools of appropriate size;
- Opening of apical foramen (for chronic granulating and chronic granulomatous periodontitis);
- Medical root canals treatment with antiseptic and anti-inflammatory agents;
- There is a turunda wet in a chosen medical agent (3% sodium hydrochloride solution, 5% dimexide solution, enzymes with antibiotics) left in a canal;
- Carious cavity closing with half-hermetic or occlusive dressing.

II patient's visit

- Antiseptic treatment of oral cavity (antiseptics mouth wash);
- Removal of occlusive (half-hermetic) dressing;
- Antiseptic treatment of root canals;
- Checking the quality of apical foramen opening (for chronic granulating and chronic granulomatous periodontitis);
- Root canal(-s) filling with material for root filling within the bounds of root apex opening;
- Carious cavity filling.

TREATMENT RECORD

**Reference number IDC K.04.5 – Chronic apical periodontitis
of a permanent tooth**

Clinical form – acute chronic periodontitis

Treatment:

Local:

I patient's visit

- Antiseptic treatment of oral cavity (mouth wash);
- Anesthetic treatment: local anesthetization, when there is sharp pain – field anesthetization;
- Carious cavity preparation taking into account topographic and anatomic peculiarities of the tooth;
- Dental cavity opening (using high-speed air-turbine handpiece) and root canals orifice opening;
- Removing of putrid degeneration from root canals under the antiseptic bath;
- Tools treatment of root canal(-s) of the whole length with using of endodontic tools of appropriate size;
- Medical root canals treatment with antiseptic agents;
- Carious cavity closing with soft dressing (cotton pellet);
- Advising of often mouth washing with antiseptic solutions;
- If there is some indication make a relieving incision along transitional fold.

II patient's visit

- Antiseptic treatment of oral cavity (antiseptics mouth wash);
- Tools treatment of root canal(-s) of the whole length with using of endodontic tools of appropriate size;
- Checking the quality of apical foramen opening;
- For medical treatment of root canals it is recommended to use antiseptic, anti-inflammatory agents;
- There is a turunda wet in a chosen medical agent left in a canal (see above);
- Carious cavity closing with half-hermetic or occlusive dressing (depending if there is or there is not slight quantity of serous exudates in a canal).

III patient's visit

- Antiseptic treatment of oral cavity (antiseptics mouth wash);
- half-hermetic or occlusive dressing removal;
- Medical root canals treatment with antiseptic agents;
- Root canal(-s) filling with material for root filling within the bounds of root apex opening;
- Carious cavity filling.

General treatment:

- Depending on patient's general condition the analgesics, antimicrobial and hyposensitization agents can be applied.

MEDICAMENTAL AGENTS USED FOR IRRIGATION AND ANTISEPTIC PROCESSING OF ROOT CANALS

Gipochloride Na (VladMiva) – 3%, 5,2% water solutions. It has bactericidal and antiseptic action. It is used in purulent environment dissolving necrotizing tissues. With the aim of bactericidal action it is recommended to use the preparation slightly warmed and increase time of action in a root canal for up to 30 minutes.

Parkan (Septodont) – stabilized solution with 3% content of purified low-sodium.

Chloramin (2% solution) – chlorine containing. It has bactericidal and and deodorizing action.

Chlorhexidine bigluconate (Ukraine) – 0,3%-0,5% solution. It has bactericidal, fungicidal and antiseptic action.

Proposol CPX (Dentsplay) – chlohexidine containing. It is used for antiseptic treatment of root canals with using of the syringe.

Krezophene (Septodont) – It is used for antiseptic treatment of root canals. The preparation contains dexomethazone. It has anti-inflammation, antiallergic and bactericidal action. It penetrates well into deltoid branching of the root canal, dental tubules.

Ekterizid (ISU) – It has antimicrobial and anti-inflammation action.

Hydrogen peroxide (3% solution) – It has bactericidal and stypic action.

Iodinol – It has bactericidal and fungicidal action. 1% solution is used for irrigation of root canals. The preparation is the color indicator of root canal purity.

PREPARATIONS FOR ANTISEPTIC DRESSINGS

Cresophen (Septodont) – non-irritating bactericidal preparation, dexamethazone containing. It is used for antiseptic processing of root canals after partial extirpation of the pulp.

Forfenan (Septodont) – It has bactericidal action. The preparation contains dexamethazone and is used for root canals processing before its filling and for processing of bad-conducting root canals.

Grinazole (Septodont) – metronidazole containing. It has bactericidal and anti-inflammatory action.

Crezodent-paste (VladMiva) – paste for temporary obturation of root canals after partial extirpation of the pulp. It has strong antiseptic action because of camphor and chlorphenole content.

Crezodent (Voronezh) – paste for temporary canals filling. It has fungicidal and bactericidal action.

Septomixine forte (Septodont) – there are antimicrobial, antifungal and corticosteroid medicines that are in preparation content. It is used when there is chronic granulomatous periodontitis and chronic periodontitis exacerbation as a material for temporary canals filling.

Evgenol – It has disinfecting and anti-inflammation action.

Camphoro-phenol – It has weak anti-inflammation, antimicrobial and pain relieving action. It used under the occlusive dressings when pulpitis treatment with devital method and when periodontitis treatment.

PROFESSIONAL ORAL HYGIENE

The dental plaque removing prevents teeth caries development and gingival inflammation. But full dental deposit removing is quite hard to realize and this is possible only if using special means, equipment and instruments while the patient strictly sticks to all doctor's orders as for personal oral hygiene. That is why each person needs periodical professional dental deposit removal.

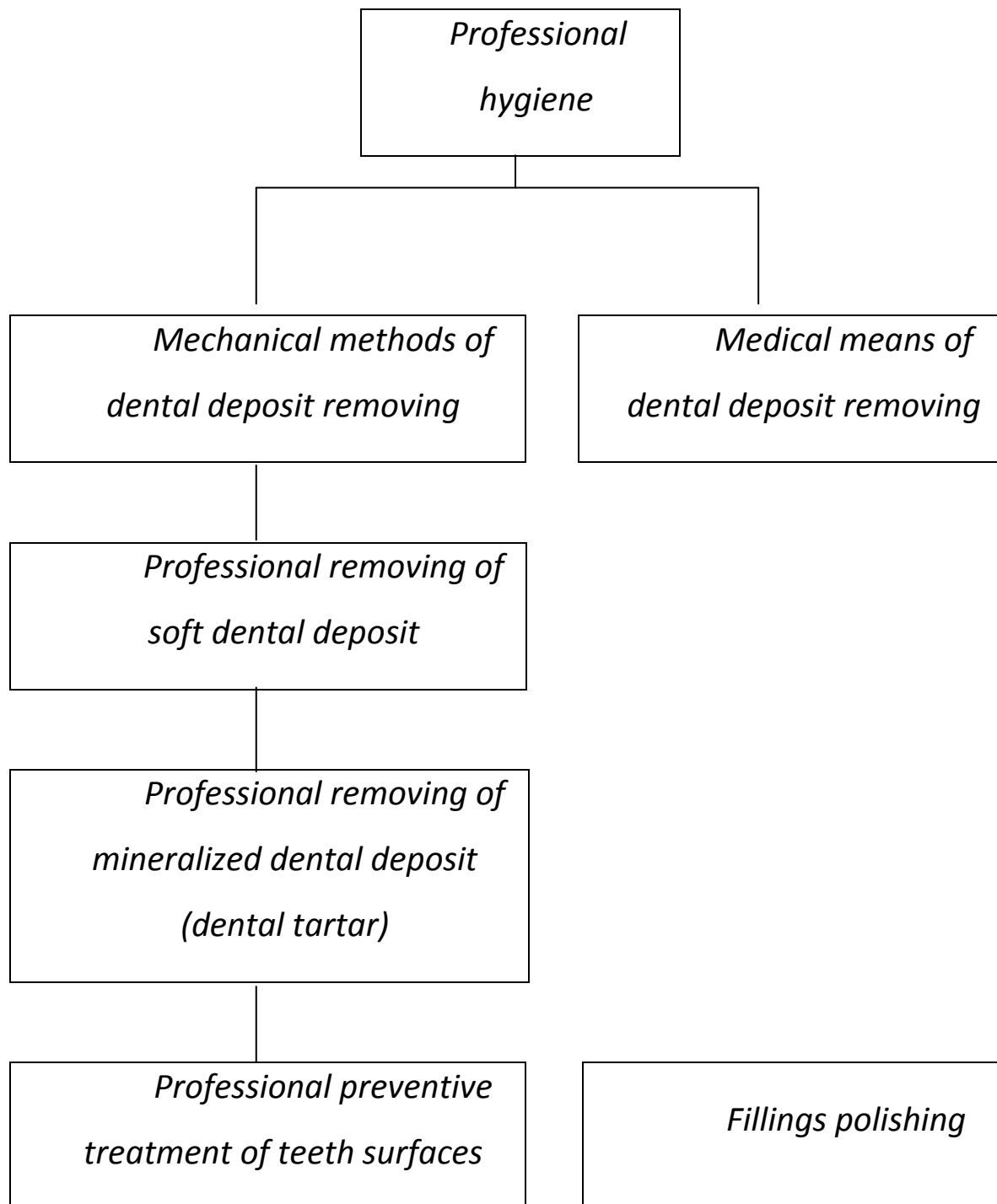
Professional hygiene is the complex of means that eliminate and prevent teeth caries development and inflammatory diseases of parodontium by means of mechanical removing of over- and under gingival deposit from the surface of a tooth.

Professional oral hygiene includes several steps:

1. Motivation of the patient as for struggling against dental disease.
2. Patient training in efficient usage of means and methods of oral hygiene treatment.
3. Removal of all dental deposit by dentist.
4. Polishing of fillings and teeth surfaces.
5. Moving factors causing dental deposit off.

Professional oral hygiene should be carried out only personal and in definite periods of time as one of the main components of dental diseases prevention. The regularity of professional hygiene carrying out depends on patient age, tooth tissues and parodontium resistance, and also anatomico-physiological peculiarities of masticatory apparatus.

Professional oral hygiene methods:



Professional hygiene provides:

1. Removing of soft and mineralized dental deposit from the teeth surfaces.
2. Personal hygiene quality control, hygiene index defining.
3. Diagnosing of caries on early stages with the help of vital staining.
4. Diagnosing of periodontal diseases.

Professional oral hygiene is carried out by the dentist with the help of instruments, medicines and means aimed for this purpose.

Items and means of professional hygiene:

- Indicators for dental deposit defining;
- Sets and systems that allow to define risk stage of dental diseases development within this very person;
- Manual, ultrasonic and air-abrasive instruments for dental deposit removing;
- Chemical means for dental deposit removing;
- Circular brushes for dental handpiece;
- Polishing caps for dental handpiece and other items for teeth surfaces polishing;
- Pastes of different abrasiveness for dental deposit removing and teeth surfaces polishing;
- Mineral containing means for usage within the clinic conditions.

Course of professional oral hygiene

Professional oral hygiene is carried out in several visits the quantity of which depends on personal peculiarities of the patient. It is recommended to start from 4 visits in 2-3 days and then increase the intervals gradually up to 15, 30, 60 days and more depending on patient ability to keep the oral hygiene. Dental examination of the patient is carried out during the first visit with the purpose to define necessary indexes (upon the age). The examination results are registered in file card for further dynamic control of oral hygiene. The connection between dental deposit, teeth and parodontium diseases is explained to the patient. The dentist also shows to the patient the dental deposit on patient's teeth with the help of the mirror and indicators (fuchsine, erythrosine, methylene blue) and the instruments (hand excavator, smoother, probe), points the places of the largest teeth deposition out.

Oral examination together with the patient allows demonstrating visually the difference between dental health and pathology. The same day the patient receives recommendations as for differential choice of items and means of hygiene, method and duration of teeth brushing taking into account personal peculiarities of the patient's oral hygiene condition.

During the second visit (the Patient shows up with the new brush and recommended paste) the dentist demonstrates teeth brushing with the help of phantom emphasizing the right place and moving of teeth brush. Then the controlled teeth's brushing is carried out.

The controlled teeth brushing is such the teeth's brushing when the patient brushes his teeth by himself but within the doctor's presence (dentist, hygienist etc.). With this purpose the patient's teeth are treated with coloring agent and the hygiene index is defined. Then the patient brushes his teeth by himself but within the doctor's presence and the hygiene index is defined again.

The dental deposit left in the hard-to-reach areas of dentition is demonstrated to the patient with the help of the mirror. If it is necessary the comments are made as for the brushing technique. The patient is also taught the rules of interdental hygiene means usage.

During the third visit the patient demonstrates his ability to brush his teeth and interdental space in a right way while the controlled teeth brushing procedure. If it is necessary the appropriate comments are made.

During the fourth visit the dentist controls patient's oral hygiene stage and observance of teeth brushing rules, corrects and gives some advice. With the purpose of self control of teeth brushing quality at home the patient is recommended to use dental deposit coloring means.

Given scheme of course of preventive means is supplemented by the procedure of soft dental deposit removing and dental tartar removing by the dentist.

Indicators for dental deposit defining

Usage of different coloring agents allows to define if there is some dental deposit and the places of its location. These agents may be used as for personal control carried by the patient as for oral hygiene stage defining by the dentist.

Coloring agents for personal usage are solutions for oral rinsing or coloring tablets for dissolution or chewing.

Coloring agents for dentist's usage are solutions for direct apply on teeth surfaces with the help of cotton tampons or pellets.

Dental plaque indicators are plenty of means (iodine, fuchsin preparations etc.). The examples are tablets and solutions of erythrosine which colors dental deposit in red. But at the same time this coloring agent colors tunica mucosa of mouth. But if dental deposit is treated with sodium fluoresceine it gets yellow glow when illumination by special light source not coloring gums. There are also combined solutions that allow to define dental plaque age. When treatment with such solution immature dental plaque (up to 3 days) is colored in red and mature dental plaque (more then 3 days) is colored in blue. The representatives of coloring solutions are also tablets Dent (Japan), Espo-Plak (Paro), solution and tablets Red-Cote (Butler), saturated pellets Rondell.

Professional removing of non-mineralized dental deposit.

Regular and adequate professional oral hygiene plays significant role in parodontium diseases and teeth caries prevention. In this case the term «professional oral hygiene» means thorough removing of soft and hard deposit from all teeth surfaces and dentogingival recesses with

following teeth and gums preventive treatment.

The most wide spread method is the mechanical method of dental depositions removing with the help of appropriate instruments. When using this method it is recommended to apply the following scheme.

Removing of dental deposit should be started from the left corner teeth of lower jaw particularly from distal surface of last left tooth. Then its vestibular surface, interdental spaces, oral surface are cleaned along the medial direction. In the same way the dental deposit on the right corner teeth of lower jaw is removed. After that the lower front area is cleaned starting with premolars of the left side and finishing with the premolars of the right side. The same order is followed when dental deposit removing in upper jaw.

It is necessary to remember that each of 4 tooth surfaces must be clean in the area of dental cervix and should not be colored by any of diagnosing solutions.

This scheme of dental depositions removal allows to control condition of all surfaces of each tooth defining promptly the earliest carious lesions and parodontium inflammation centers.

As a rule preventive dental deposit removing does not cause any pain. Pain may appear only while inspection of pathological dentogingival recesses. In such cases it is reasonable to use application anesthesia. For pain prevention (pain may be connected with hypersensitivity or non-carious lesions of teeth enamel) the fluoride-containing solutions' applications are applied within the causative areas.

Different abrasive pastes for dental deposit removing and teeth surfaces polishing.

Professional preventive pastes are aimed at removal of non-mineralized dental deposit, immature dental deposit, pigmented deposit of a smoker and also for teeth surfaces polishing after dental deposition removing.

According to composition professional pastes are similar to those for personal hygiene but they differ from the latter because they have no active components but they do have more significant abrasiveness. Pumice, zirconium silicate, zirconium oxide, silicon dioxide, calcium phosphates are used as abrasive filling of professional pastes.

According to abrasive component size pastes are subdivided into: high abrasive ones (Proxyl RDA-83 (Vivadent) Nupro coarse (Dentsply), Polydent №1 (VladMiVa)), medium abrasive ones (Proxyl RDA-36 (Vivadent), Nupro medium (Dentsply), Polydent №2 (VladMiVa), Protect (Butler)) and low abrasive ones (Proxyl RDA-7 (Vivadent), Nupro fine (Dentsply), Polydent №3 (VladMiVa), Sitsalicine (Pierre Rolland, France), Zircon-Fluor Treatment Paste (Product Dentaires, Switzerland)).

Professional pastes are also subdivided into non-fluoric and fluorine-containing ones. Non-fluoric pastes are used for teeth brushing before filling with usage of composite materials and fissures sealing. Fluorine-containing pastes usage in these cases may cause abnormalities in forming of microcellular structure of enamel when treated with acid. Typical non-fluoric professional pastes are Detartrine (Septodont), Proxyl (Vivadent), Nupro without fluorine (Dentsply) etc. In other cases

it is reasonable to apply polishing fluoride-containing pastes: Cleanident (Nawe Neos Dental), Detartrine fluoree (Septodont), Nupro (Dentsply), Protect (Butler), Polydent (VladMiVa).

Teeth paste treatment is carried out with the help of end brush, soft rubber hand cup, flat dental floss or stripe at medium speed and small pressure. To make the treated surface shiny small drop of water should be applied at this surface.

Circular brushes for dental hand piece

When professional oral hygiene the circular brushes are applied for removing of non-mineralized thick dental deposit. These brushes are also used after dental tartar removing and pigmented deposit removing with the help of ultrasonic, air-abrasive or manual instruments.

Circular brushes for dental hand piece can be of different forms, sizes and hardness. Pointed (conic) brushes are used for brushing of interdental spaces and fissures. Brushes with flat brushing area are used for brushing of smooth and masticatory surfaces. Their size depends on group teeth belonging (molars or premolar).

Brushes work is conducted at speed of 5000-10000 revolutions per minute with supplying of small amount of paste or water.

Polishing cups for dental hand piece and other means for teeth polishing

The obligatory finishing stage of dental deposit removing and caries treatment is polishing of teeth surfaces and fillings because absence of overhanging edges and smooth teeth's and fillings' surface prevents accumulation and retention of dental deposit and food remains.

Special rubber caps (cups), cones, end brushes, polishing stripes,

flosses are used for polishing.

Rubber caps are applied for polishing and soft dental deposit removing from smooth and sometimes occlusal teeth surfaces. Those caps are subdivided into soft, of medium hardness or hard ones. Soft rubber caps can be of full hollow, it can also have ledges, septums, and with nylon brush that is built-in. The caps are firstly filled with preventive polishing paste of different abrasivity.

For masticatory surfaces polishing and soft dental deposit removing in the area of fissures, fossa, natural deepening it is better to apply end brushes adding a small amount of water. With this purpose the firm Nawe Neos Dental for example produces special occlusive brush «Occlu Bruch». The brushes can also be used at smooth surfaces if there are some stains on it.

For approximal teeth's surfaces brushing it is better to use polishing and grinding stripes – strips. There are metallic and plastic ones. The plastic ones are often covered with abrasive material from one side for grinding and the other side of the stripe is covered with abrasive material for polishing. The metallic strips contain one kind of abrasive material (aluminum oxide) but this kind of strips can be used several times after appropriate sterilization was conducted. It is not possible to use the plastic ones in such way. It is also possible to apply flat dental floss or stripes with polishing paste and rubber polishing cones for dental hand piece for contact surfaces brushing.

Most of modern firms produce special sets (systems) for grinding and polishing of teeth and fillings surfaces.

For example «Enhance» system (Dentsply) includes following

instruments: discs, inverse cones, cups. If these instruments are pressed to filling applying some force it will remove material excess and will shape composite. But if those instruments are applied without force involving they will polish composite and tooth surface.

Vivadent firm produces special finishing sets that include rubber heads and cups aimed at grinding (Politip F) and polishing (Politip P).

3M ESPE firm and Nawe Neos Dental firm produce «Sof-lex» systems (discs and stripes) for final fillings treatment. Abrasiveness level of these sets is encoded by color.

Manual instruments for dental deposit removing

Nowadays manual instruments for mineralized dental deposit removing are of different shape such as hooks, chisel, rasp, curette.

Hooks are used for removing of above gingival mineralized dental deposit and under gingival dental tartar within the area of free edge of gums. These hooks can also be applied for deposit removing from interproximal surfaces. Hooks are subdivided into mattock-like ones and crescent ones (straight and arc-curved ones).

Chisel manual instruments are used for dental tartar removing from approximal surfaces of frontal and frontal corner teeth.

The rasp (scaler file) is used for removing of considerable dental deposit by its scraping from teeth surfaces.

Hooks, chisel, rasp manual instruments have got a sharp end. As opposed to them the curettes have got round end and are used for removing of dental deposit (including bifurcational ones) which is under gum provided that there are some parodontal recesses. The curettes can also be applied for small deposit removing (the deposit is above the

gum), removing of necrotizing infected root cement, granulation tissue and epithelium of parodontal recess. Curette handle can be hard, flexible or of medium flexibility. Hard cures are aimed at removing dense (above gum – more often) dental tartar. Cures of medium flexibility are used for removing of medium mineralized dental deposit. Flexible instruments are used for removing of slightly mineralized dental deposit (under gums – more often) and detection (probing) of dental tartar. The cures are subdivided into universal ones and special ones (specific according to the areas). Universal cures are used in all bite quadrants and all teeth surfaces. As a rule they are of medium hardness. Special cures can be flexible («thin» ones) or hard aimed at efficient treatment of defined tooth surface and hard-to-access areas of tooth root surface, more often if there is a parodontal recess. There are some instruments for frontal and posterior (lateral) teeth, under palate, tongue and vestibular surfaces.

Instruments for removing of dental tartar have to be sharp. That is why they have to be sharpened after each use. To provide tight conformity the instrument for dental deposit removing has to fit strictly the peculiarities of surfaces of tooth root, dental cervix and crown.

For dental deposit removing from implants and treatment of particularly bared root surfaces there were developed so-called soft scalers-cures and mattock-like hooks that their working part made of very firm plastic.

Professional removing of mineralized dental deposit

Timely removing of mineralized dental deposit is very important in prevention of parodontium diseases. In addition dental tartar has to be

considered as local infection core that can cause not only several pathological processes in oral cavity but also general organism intoxication.

Dental deposit remains that were not removed promote quick new layers formation and that may traumatize gingival edge. That is why removing of under- and above gingival dental tartar has to be thoroughly conducted and following rules are to be observed:

1. All instruments are to be sterilized to avoid infection of close tissues.

2. Before dental tartar removing it is necessary to carry out gingival antiseptic treatment with solutions of hydrogen peroxide, iodine, Shiller-Pisarev, Lyugol etc.

3. Treated teeth have to be isolated from saliva with the help of cotton pellets.

4. Dentist's hand that holds the instrument has necessarily to be fixed on patient's chin or neighboring teeth.

5. Movable teeth are to be fixed by fingers of left hand.

6. During the procedure of dental tartar removing the instrument's movements have to be lever-like, scraping and the same time these movements shouldn't damage gums.

7. Sizes and form of the instrument (especially for undergingival curettage) have to correspond to curves of teeth surface and gingival recess space.

There are several *dentists' positions* as to the patients that are recommended for thorough dental deposit removing from all dentition:

Position 1 – dentist is in front of the patient. So dentist has the

possibility to treat all surfaces of the 13th, 12th, 11th, 21st, 22nd, 23rd teeth and also tongue surfaces of left molars and cheek surfaces of right molars.

Position 2 – dentist is behind the patient. So he has the possibility to treat all the surfaces of the 33rd, 32nd, 31st, 41st, 42nd, 43rd teeth.

Position 3 – dentist is behind the patient, the patient's head turned to the right side. So the dentist has the possibility to treat cheek surfaces of upper and lower left molars and premolars and also under-palatum surfaces of upper right ones and tongue surfaces of lower right molars and premolars.

Position 4 – dentist is behind the patient, the patient's head is turned to the left side. So the dentist has the possibility to treat cheek surfaces of upper right and under-palatum surfaces of upper left molars and premolars.

Undergingival dental tartar removing has to be controlled with the help of probe if there are some pathologic teeth and gingival recesses. At the same time it is necessary to remove granulations. The anesthesia is to be applied in these cases.

Constant observance of these methods while dental deposit removing promotes its gradual effectiveness raise because the dentist works some stereotype of movements out so manual skills are improved.

For mechanical dental tartar removing it is recommended to use special manual instruments that look like hooks, chisel, rasp etc. choosing appropriate tool for each tooth surface.

Ultrasonic and air abrasive instruments for dental deposit removing

Lately there are some sonic, ultrasonic and air abrasive systems that are used in dentistry for dental deposit removing.

Sonic systems (Titan-S Sonic Scaler, Micro-MegaAir Scaler etc.) are represented by pneumatic scalers. These instruments operate with the help of pressured air that is provided by turbine of dental unit. Vibration frequency is 10000 per second that prevents the root surface traumatizing by the instrument. Dental deposit is removed by vibration of working section and with the help of sheet of water that is targeted at tooth surface. If there is no cooling some thermal damage of tooth hard tissues and surrounding soft tissues can raise.

Ultrasonic systems (Cavitron Select, Pieson Master, 402 system (EMS), Amdent US30) transform current into micro vibrations with the frequency of 25000 – 50000 Hz. Dental deposit is ruined at the expense of irrigation, cavitation effect, mechanical component and acoustic turbulence. Ultrasonic scalers can be piezoelectric (piezoceramic) ones or magnetostrictive ones. Ultrasonic systems need sufficient cooling by water or pharmacologically active agents (chlorhexidine for example) that make it difficult to examine working link and complicates its usage for treatment of deep parodontal recesses.

While a tooth's brushing with the help of sonic and ultrasonic units it is necessary to observe the following rules:

1. Do not put the end of the instrument perpendicularly to tooth surface.
2. Do not push on tooth surface in any way.

3. Do not use unit without watering.

Because of vibration that raise while teeth brushing with the help of sonic and ultrasonic systems and also because of sufficient pressure of instrument's working section on the tooth there can be some deepenings up to 0,1 mm on surfaces of tooth hard tissues. That is why end of working section of the instrument of mechanical systems has to be of round shape. While treating teeth surfaces with the help of this instrument it is necessary to make intermittent movements, slightly pushing and having tight contact. It is not recommended to use mechanical systems for treatment of implants and when taking care of patients with implanted heart stimulators.

Piezoelectric systems produce vibrations due to fixed ceramic crystals that are situated directly in the handpiece. Under action of electricity the crystals vibrate and transfer these vibrations to working section with the frequency of 20000-35000 Hz. The piezoelectric technology gives only translatory rotational (linear) motion of working section that is limited by frontal and back surfaces of the instrument. There are several forms of working sections (mostly flat ones) that were developed for these systems.

Magnetostrictive systems allow to get different kinds of ellipsoid vibrations – starting from linear ones and to circular vibration. They appear due to influence of weak magnetic field at hand piece's metal plates that make the working section vibrate with frequency of 40000 – 60000 Hz. There were different kinds of hand pieces developed for magnetostrictive systems. Those hand pieces suit any clinical situation. In addition magnetostrictive hand pieces are safer for tooth structure.

Air abrasive systems brush teeth surfaces with the help of mix of water and sodium bicarbonate powder that is moved by high pressured air. Units of this type may be as separate blocks that are connected to ac network and to network of compressor pressured air. These units may also be as hand pieces that are placed at the place of air-turbine hand piece of dental unit.

Powder jet devices (Air-Flow (EMS), Prophyflex (Kavo), Prohy-JET Cavitron (Dentsply), ProphyEST (Geosoft Pro)) are aimed at high quality fissures brushing of masticatory surfaces, removing of colored deposit (food colouring agents, smoker's colouring) from teeth surfaces, brushing of smooth teeth surfaces before brackets fixation, polishing of teeth surfaces after scaling.

During air abrasive systems operation it is necessary to isolate soft tissues and use suction devices because powder that gets to gums at high speed may damage epithelium. Power jet devices are not recommended to use at the areas of bared root cement and also for treatment of fillings made of composite materials.

If modern systems are used in a right way the patients do not feel pain, they haven't got any negative emotions that may appear when mechanical way of tooth tartar removing. But it is possible to apply different methods of dental deposit removing.

Irrespective of chosen way of dental deposit removing this procedure has to be finished with teeth polishing also using appropriate pastes and instruments.

Chemical agents for dental deposit removing

Nowadays there are less traumatic ways of dental deposit

prevention and removing: that means creation of such conditions when this dental deposit cannot appear or it can be chemically dissolved.

There are some medical means to fight with, to prevent and to dissolve dental deposit. These means stabilize dental plaque growth, hold up and decrease dental deposit and dental tartar formation, depress calcification of microbial remains, decrease virulence of microorganisms, dissolve and remove dental plaque from teeth surfaces and may partially or fully replace existing methods of rational oral hygiene. These means can be active in very small concentrations at pH and temperature of oral cavity, they are not dangerous and nontoxic, and they do not cause addiction. Modern dentistry subdivides those dental deposit fighting medical means into 5 groups.

Group 1 – desorbents – preparations that disturb adsorption of bacterium on teeth surface and due to this they prevent dental plaque formation. They are fluorine preparations, monofluorinephosphates, glycerophosphates, fluorine containing polyelectrolytes, tin and sodium fluoride at low concentrations. These preparations desorb bacterium, saliva glycoproteids and albumen from tooth enamel surface.

Group 2 – surfacetant agents – preparations that have bactericidal and bacteriostatic properties: antibiotics, antifungal agents, antiseptics. They prevent dental tartar formation and «untie bacterium» making dental plaque thinner.

Group 3 – special films that break dental plaque and dental deposit fixation: 2% undecine acid, 20% undecine zinc, carnations or cinnamon oil etc. The hydrophobic barrier is formed when applying these films on the teeth surface. Oil films remain till next ingestion.

Group 4 – enzymes and nonenzyme preparations that have good cleansing properties because of influence on organic matrix of dental plaque: protease, dextranase, mucinase, hyaluronidase and other proteolytic and aminolytic enzymes of bacterial and vegetable origin and also urea preparations.

Group 5 – dissolvents – preparations that are able to destroy dental tartar: weak acids (hydrochloric, ascorbic, trichloroacetic, lactic acids), hydroquinone. These agents are used to soften tightly fixed mineralized dental deposit before its final removing especially on movable teeth. Preparations are applied on surfaces of mineralized dental deposit for 30-60 seconds (sometimes for more than this time) and afterwards they are washed off and dental tartar is removed using ordinary methods.

Mineral containing agents for using in clinic

Mineral containing professional agents are used by dentists for episodic applying on patient's teeth at clinic with anti-caries or anti-inflammatory aims and contain macro- and microelements that promote mineralization processes. Typical forms of mineral containing agents are represented by solutions, varnishers and gels. The most widely spread compounds in composition of mineral containing solutions are: fluorine compounds (sodium fluoride 0,2%, 1-2%; tin fluoride 8-10%; sodium monofluorinephosphate; potassium fluoride; aminofluorides), calcium compounds (calcium gluconate 10%; calcium glycerophosphate 2,5%; calcium chloride 10%) or phosphorus compounds (sodium monofluorinephosphate; sodium chloride of hexa-phosphoric acid).

There are also complex remineralizing solutions: remodent and prophokar.

Remodent preparation (developed at Medical College of Riga in 1975) is synthesized from natural materials (high-purity bone powder made of jawbones of young cattle) and consists of complex of ions of macro- and microelements that are necessary for activation of remineralization process and caries prevention: calcium – 4,35%, phosphorus – 1,36%, magnesium – 0,15%, potassium – 0,20%, sodium – 16,0%, chlorine – 30,0%, organic agents – 44,0%, manganese, iron, zinc and other microelements – up to 100%.

Prophokar (developed in Kiyev by group of authors headed by L.O. Khomenko) is demineralization product of cylindrical bones of cattle and contains optimal quantity and ration of basic chemical elements that are necessary for building of crystal lattice of enamel apatites: calcium, phosphorus, fluorine, magnesium, iron, zinc, potassium, chlorine, copper, plumbum.

Remineralizing solutions are used as applications, electrophoresis or phonophoresis. But usage of mineral containing solutions guarantees only short time effect on enamel of remineralizing compounds that are quickly washed off. That is why it is more reasonable to use special mineral containing varnishers.

Mostly they are – fluorine containing varnishers (Duraphat (Woelm), Duraphat (Colgate), Bifluorid (VOCO), Fluor Protector (Vivadent), Phtorlak (Russia) etc.). Varnishers film remains on teeth surface for quite a long time and that provides prolonged saturation of

enamel and dentine with fluorine ions. Besides varnishers applying does not need any additional procedures (electrophoresis or phonophoresis).

Modern fluorine containing varnishers are subdivided into:

1. Hard varnishers (based on acrylates, polyurethane, epoxy and other materials) create hard non-penetrating long lasting film on tooth surface.

2. Soft varnishers (based on natural resins) remain on tooth surface not long.

It is not recommended to use hard varnishers when working with children because these varnishers influence adversely enamel exchange processes and decrease its penetrability.

Fluorine containing gels are quite similar to fluorine containing varnishers as for its purpose (meaning Belagel F and Belagel Ca/P (VladMiVa, Russia – water based without organic solutions), Fluoridin gel 5 (Voco) – wood resin based containing sodium fluoride 5%). These gels are applicationally applied on teeth surfaces (as varnishers do) and create a film that remains for a long time.

A special group of mineral containing professional means consists of fluorine containing paper and paraffin discs for dental hand piece. They are used at small speed while circular and translatory movements and circus movements. When there is mixed occlusion only permanent teeth are treated with fluorine containing discs.

It is necessary to remember that professional mineral containing means are only aimed at usage by dentist and it is strictly forbidden to recommend them to the patients for domestic use.

**PRESCRIPTIONS OF MEDICATION
THAT ARE USED IN PREVENTIVE DENTISTRY**
(short list)

Medications used for hyperesthesia treatment

Rp.: Sol. Natrii Fluorati 1% -25,0

D.S. rub into tooth sensitive places on cotton pellet.

Rp.: Calcii glycerophosphatis 7,0

Sol. Natrii chloride 0,75% - 3,0

M.D.S. for rubbing into tooth hard tissues when there is hyperesthesia.

Rp.: Calcii glycerophosphatis 0,5

D.t.d. N. 90

S. 1 powder 3 times a day before eating when there is teeth hypersensitization.

Medications used for caries treatment and prevention

Rp.: Zinci oxydi 1,0

Eugenoli g.s.

M.f. pasta

D.S. Medical liner when there is deep caries.

Rp.: Trypsisni crystallisati 0,002

Norsulfazoli 0,2

Laevomycetini 0,01

Sol. Natrii chloride isotonici 2 ml

Bolus albae g.s.

M.f. pasta

D.S. Medical liner when there is deep caries.

Rp.: Neomycini sulfatis 0,1

Hydrocortisoni 0,01

Bolus albae 0,5

Oleum persicorum g.s.

M.f. pasta

D.S. For deep caries treatment.

Rp.: Sol. Natrii Fluoridi 0,05% 50 ml

D.S. For mouth washing.

Rp.: Sol. Natrii Fluoridi 0,2% 50 ml

D.S. For applications on tooth enamel surface or for electrophoresis (introduce from cathode during 10 minutes), course is 4-7 procedures.

Rp.: Phthorlacum 25 ml

D.S. Put on teeth surfaces.

Rp.: Sol. Calcii glyconatis 10% 10 ml

D.t.d. N 20 in amp.

S. For applications or electrophoresis on tooth hard tissues (introduce from anode during 20 minutes).

Rp.: Remodenti 3% 100,0

D.S. For applications on tooth hard tissues, 20 minutes.

Course is 20 procedures.

Rp.: Sol. Calcii glycerophosphatis 2,5% 100,0

D.S. For electrophoresis in tooth hard tissues, 20 procedures.

Medications used for antiseptic treatment of carious cavities and root canals

Rp.: Sol. Hydrogenii peroxydi dilutae 3% 50 ml

D.S. For carious cavity treatment.

Rp.: Sol. Chloramini 2% 30 ml

D.S. For carious cavity treatment.

Rp.: Chlorhexidini 0,06% 50ml

D.S. For carious cavity treatment when there are deep caries and pulpitis.

Rp.: Sol. Furacilini 0,02% 20 ml

D.S. For carious cavity treatment when there is caries.

Medications for necrotizing of dental pulp

Rp.: Flidi arsenicosi anhydrici

Dicaini aa 2,0

Ol. Camphorae q.s.

M.f. pasta

D.S. For dental pulp devitalization.

Rp.: Paraformaldehydi 3,0

Novocaini 0,03

Azbesti pulverati 0,5

Vaselini 1,25

M.f. pasta

D.S. For dental pulp devitalization. Apply for 5-6 days.

Medications for anaesthetization

Rp.: Sol. Ubisthesini 4% -1,7 ml

D.S. For anaesthetization in dentistry.

Rp.: Sol. Lidocaini 2% 2 ml

D.t.d. N 5 in amp.

S. For anaesthetization in dentistry.

Rp.: Sol. Pyromecaini 4% 10 ml

D.t.d. N 10 in amp.

S. For application anaesthetization (druk- anesthesia).

Rp.: Sol. Dicaini 1% 5 ml

D.S. For application anaesthetization.

Preparations, antidotes of arsenic

Rp.: Sol. Unithioli 5% - 5,0

D.t.d. N 10 in amp.

S. For application on gum mucous tunic.

Rp.: Jodoformii 20,0

D.S. Powder.

Rp.: Sol. Jodinoli 1% - 100,0

D.S. For application on gum mucous tunic.

Rp.: Sol. Kalii iodidi 10% - 20,0

D.S. For application on gum mucous tunic.

For in-canal electrophoresis of gum.

Indicators of dental deposit

Rp.: Iodi 1,0

Kalii iodide 2,0

Ag. Destill. 40 ml

M.D.S. Sol. of Shiller-Pisarev. Apply on teeth surfaces with cotton pellet.

ODONTOPATHOLOGY IN LATIN

CARIES

Acute initial caries – *macula cariosa acuta*

Chronic initial caries - *macula cariosa chronica*

Acute superficial caries – *caries superficialis acuta*

Chronic superficial caries - *caries superficialis chronica*

Acute median caries – *caries media acuta*

Chronic median caries – *caries media chronica*

Acute deep caries – *caries profunda acuta*

Chronic deep caries - *caries profunda chronica*

PULPITIS

Acute traumatic pulpitis – *pulpitis acuta traumatica*

Pulp hyperemia – *hyperaemia pulpaе*

Acute partial pulpitis - *pulpitis acuta partialis*

Acute diffuse pulpitis - *pulpitis acuta diffusa*

Acute suppurative pulpitis - *pulpitis acuta purulenta*

Chronic simple (fibrous) pulpitis – *pulpitis chronica simplex (fibrosa)*

Chronic hypertrophic pulpitis – *pulpitis chronica hypertrophica*

Chronic gangrenous pulpitis – *pulpitis chronica gangraenosa*

Chronic concrementous pulpitis – *pulpitis chronica concrementosa*

Chronic root pulpitis – *pulpitis chronica pulpaе radicis dentis*

Exacerbation of chronic simple (fibrous) pulpitis – *pulpitis chronica simplex (fibrosa) exacerbatio*

Exacerbation of chronic gangrenous pulpitis – *pulpitis chronica gangraenosa exacerbatio*

Exacerbation of chronic root pulpitis – *pulpitis chronica pulpaе radicis dentis exacerbatio*

PERIODONTITIS

Acute traumatic periodontitis – *periodontitis acuta traumatica*

Acute serous periodontitis - *periodontitis acuta serosa*

Acute suppurative periodontitis - *periodontitis acuta purulenta*

Chronic fibrous periodontitis – *periodontitis chronica fibrosa*

Chronic granulating periodontitis - *periodontitis chronica granulans*

Chronic granulomatous periodontitis - *periodontitis chronica granulomatosa*

Exacerbation of chronic fibrous periodontitis - *periodontitis chronica fibrosa exacerbatio*

Exacerbation of chronic granulating periodontitis – *periodontitis chronica granulans exacerbatio*

Exacerbation of chronic granulomatous periodontitis – *periodontitis chronica granulomatosa exacerbatio*

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