POLTAVA STATE MEDICAL UNIVERSITY
THERAPEUTIC STOMATOLOGY PROPAEDEUTICS CHAIR

Devital methods of pulpits treatment

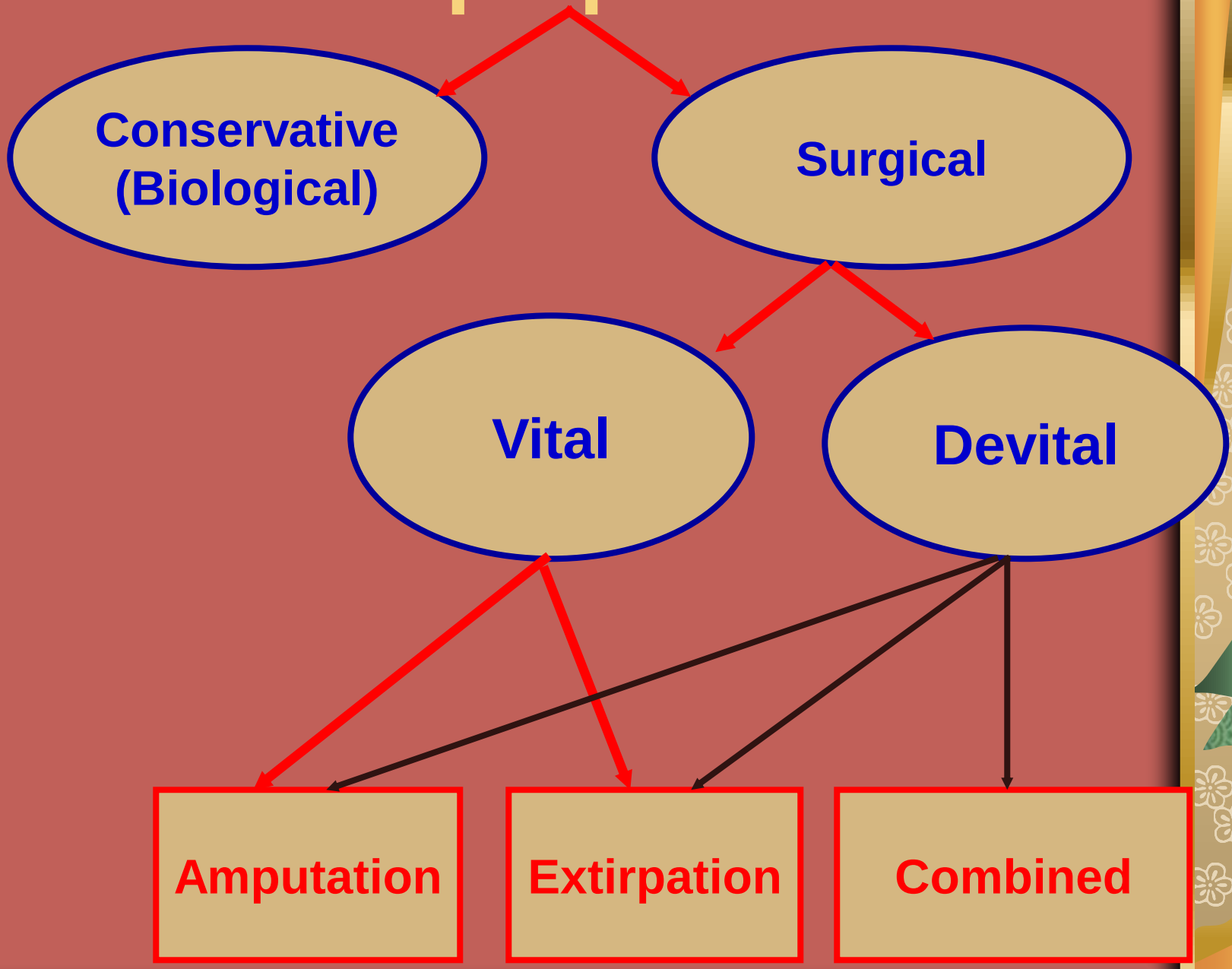
Lecture for 3-rd year students
of international faculty

The lecturer: PhD in Medical Sciences,
Associate Professor
Marchenko Iryna Yaroslavovna

Lecture plan

- Methods of pulpits treatment.
- Remedies for devitalization. Mechanism of its activity.
- Devital extirpation: definition, indications to application, stages of performance.
- Devital amputation: definition, indications to application, stages of performance, complications.
- Devital combined method: definition, indications to application, stages of performance.

Methods of pulpits treatment



Remedies for devitalization

- Arsenic-paste (As), Pulparsen, Causticin;
- Paraformaldehyde-paste, «Parapasta» (Chema, Polfa), «Depulpin» (VOCO), «Devipulp», «Toxovit», «Necronerv».

Arsenic (As_2O_3) has been offered at first in 1836 by Spooner for pulp devitalization .

It is a white, low soluble powder in water with weak acid reaction. 0,0002-0,0006 g of it is used for devitalization, recommended duration of activity in single-root teeth - 24 h, in multirooted teeth - 48 h.

Mechanism of arsenic activity

It is the protoplasmatic poison, attacks oxidative ferments of a pulp (oxydase), disturbs a histic breath and as a result - hypoxias. In reply to a primary irritation dilating of veins (capillary vessels) becomes perceptible, the coagulation is educed, there are hemorrhages. The edema squeezes pulp tissues. There are an granular decay of myelinic shells of nerve fibrils, decay of the axial cylinder. Depth of a lesion depends on period of action and a dose of arsenous acid. In composition of arsenous paste enters: anesthetics agents, antiseptics, the agents retarding diffusion of arsenic in a pulp tissue, decreasing toxic activity (Acidum carbolicum, tannin, iodoform,an eugenolic or a camphoric oil).

Mechanism of paraformaldehyde activity

- Paraformaldehyde has less toxic properties. It possesses the expressed bactericidal activity which is bound up with evolving of a gaseous formaldehyde. High concentrations of paraformaldehyde at its prolonged activity causes a necrosis of tissues. The mechanism of activity of a formaldehyde consists in its influence on an endothelium of capillars, dilating of veins, a blood stasis in them and a gradual mumification of pulp tissues which transform into dry grey filament.
- The drug has less toxic an effect on periodontium tissues.
- Under the influence of the pastes containing paraformaldehyde, pulp devitalization comes in 6-7 days in single-root teeth and in 10-14 days - in multirooted.

Devital extirpation

The method provides full removal preliminary destroyed pulp. It is a doctor's choice method, but its application is limited because it has toxic action. It is used when doctor can not apply local anaesthesia (allergy to anaestetics, seriously ill patients with heart diseases)

- **Indications to application:**

  all forms of a pulpitis.

- **Restriction to indication:**

  - acute purulent pulpitis,
  - pulpitis complicated with periodontitis.

The first visitation (Pulp devitalization)

1. Antiseptic processing of an oral cavity.

2. Anaesthesia: applicational or injectional.

At chronic pulpitis in the presence of the dissected pulp cavity (the pulpal chamber) anaesthesia is not necessary.

3. The partial preparation of carious cavity.

After disclosing of carious cavities a softened dentine is removed stage by stage, at first from cavities walls by acute excavator or a round bur, and then from a bottom of carious cavities, periodically using applicational anaesthetic.

The first visitation
Pulp devitalization

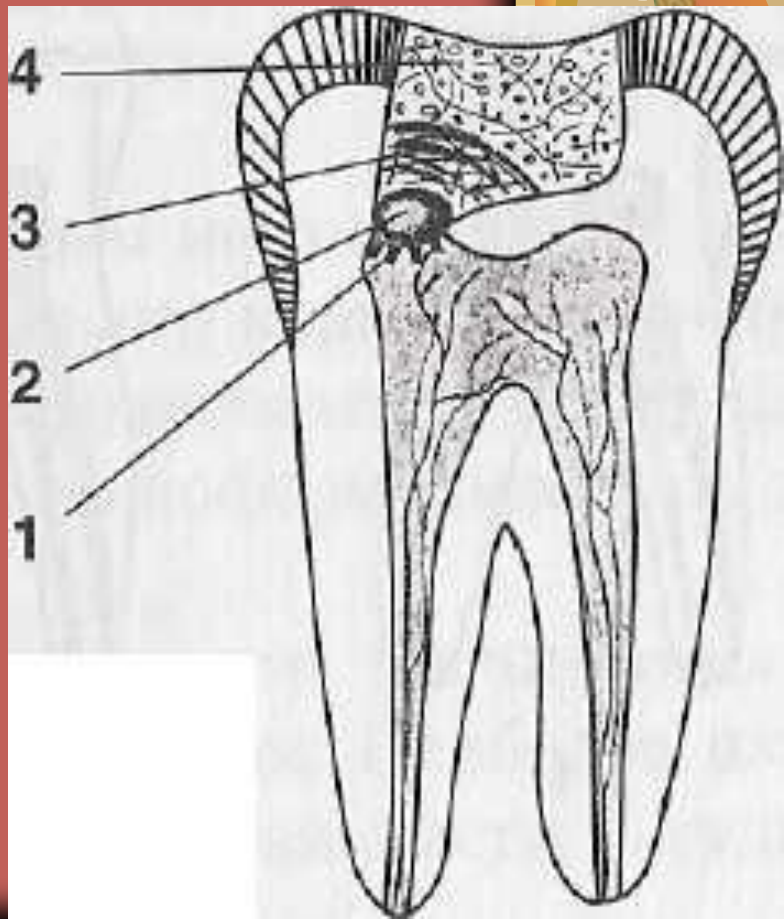
4. Pulp cavity disclosing (in a point of projection of pulp horns). It takes out or reduces intrapulpal pressure, creates the condition for outflow of an exsudate from a pulp, provides penetration of devital remedy in pulp. Carious cavity must be cautiously irrigated (wash out) by warm solution of an antiseptic and dried up by cotton pellet.

5. Insertion of devital pastes. Necessary quantity of devital pastes is taken on a probe tip: arsenous (volume of a head of bur № 1 (approximately 0,0006-0,0008 g of arsenic); paraformaldehyde - twice more.

The first visitation
Pulp devitalization

- Actioning on pulp, devital paste irritants it, can intesify exudation and sense of pain. For its reduction and retarding diffusion of arsenic acid paste is coated with half - moisten cotton pellet with Phenolum-camphora and Anaesthesinum powder.

6. Carious cavity with out pressure hermetically occlude artificial dentine, dentine-paste or liquid mixed phosphat-cement.



The second visitation
Pulp extirpation

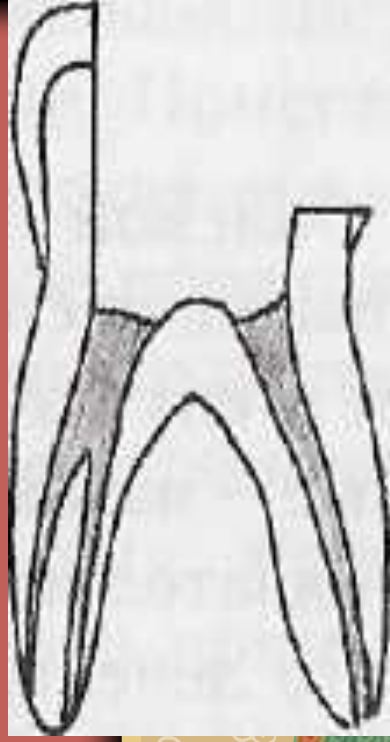
After inquiry and objective inspection of the patient:

1. Removing of hermetical bandage;
2. Definitive preparation of carious cavities.
3. Disclosing of tooth cavity (removing of pulp chamber arch) is made with control of tooth cavity topography.

The pulp cavity arch is cut off by fissure bur, walls of carious cavities should transfer in walls of pulp cavity.

The second visitation
Pulp extirpation

4. Amputation of crown pulp of tooth. Pulpotomy is made by acute excavator or round bur in premolar and molar teeth.
5. Expansion of root canals ostium. It is used spearhead drill or burs of type «Gates-Glidden», «Largo», «Orifice opener»;
6. Extirpation of pulp from root canals. Extirpation root pulp (pulpectomy) is carried out by pulpextractor, which length and dimension should match to dimensions of the root canal of tooth. The instrument enters into canal by its wall untill stopping, carefully scrolled on 2-2,5 turns, then extract together with pulp.



The second visitation
Pulp extirpation

7. Medicamental and instrumental processing of root canals. It is made with endodontic tools:

- For passage of root canals – K-reamer, K-flexoreamer, K-nitiflex (riming);
- For expansion and alignment of canals – K-file, K-flexofile, H-file, pro-files (filing).
- Antiseptic solutions for root canal processing:

  2,5 % – 5,25 % solutions of hypochlorite natrium;

  2 % a solution of chloraminum;

  3 % a solution of hydrogen peroxide;

  0,06 % - 1 % solutions of chlorhecsidynum;

  0,1 % a solutions of dimexidum;

  3 % stabilisating solution Parsan (Septodont);

  Proposal (Densply).

Processing methods of root canal:

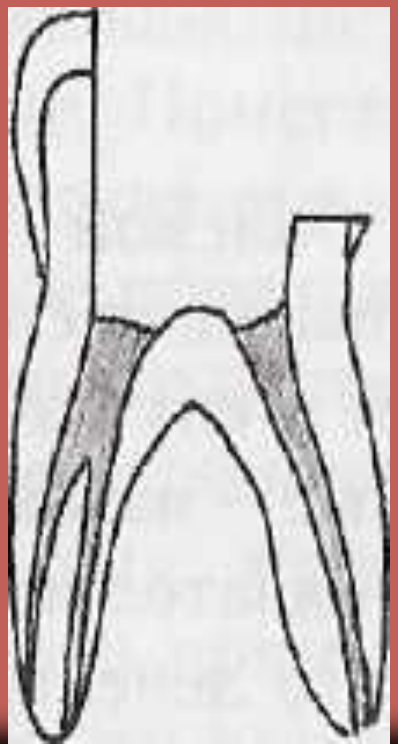
- Step-Back – from apex to ostium, it means from smaller size of tool to larger;
- Crown Down (step forward) – from ostium to apex. It is preferably at treatment of acute purulent or chronic gangrenous pulpitis because probability of pushing the infected contents of canal through apex to periodontium reduces ;
- Technique of "the balanced force» for very curved root canals. Rotary counter-clockwise movements are made. The canal would not be straightened, but in regular intervals expended with preservation of natural curvature. Tools with a nonaggressive tip (K-nitiflex, Batt-tip) are used.
- Technique with machine rotating tools.

Remedies for chemical expansion of root canal and simplification of processing:

- 10 - 20 % solutions of EDTA;
- Trilon B – 10 % dinatrium salt of EDTA;
- 2,5 %–5,25 % solutions of hypochloryte natrium;
- Largal ultra (Septodont);
- Verifix (SPAD) – solution of lemon and propionic acids;
- Canal plus;
- Clorax (SPAD) – 5,25 % a solution of hypochloryte natrium;
- Vagotil – 36 % water solution of polymethylene-metakresatin-sulphonium acid

The second visitation
Pulp extirpation

8. Filling of root canals;
9. Constant filling of pulp chamber and crown cavity;
10. Polishing of the filling.



Devital amputation

The method provides partial removing preliminary destroyed pulp with the subsequent mummification of root pulp.

It is applied extremely seldom because it has considerable quantity of complications arising after treatment

Indications to application:

- ✓ Seriously ill patients of senile age;
- ✓ Restricted mouth opening;
- ✓ Absolutely impermeability of root canals of multiroot teeth because of its strongly curvature or breakage of endodontic tools
- ✓ Milk teeth.

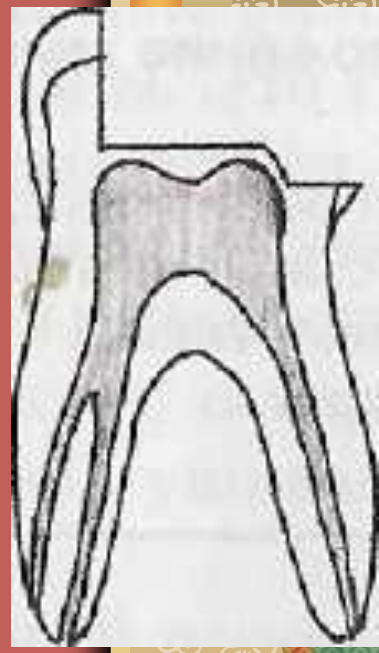
Contraindications:

- ✓ single-root teeth (frontal teeth), because of teeth dyeing (from pink to brick colour).
- ✓ Teeth with permeable canals.

Devital amputation

The second visitation

1. Removing of hermetical bandage;
2. Definitive preparation of carious cavities.
3. Disclosing of tooth cavity (removing of pulp chamber arch) is made with control of tooth cavity topography.
4. Amputation of crown pulp of tooth.
5. Expansion of root canals ostium and removal pulp from ostium part of root
7. Medicamental processing and drying of pulp cavity;
8. Mummification of pulp stump (coating by mummificating or metaplasic paste).

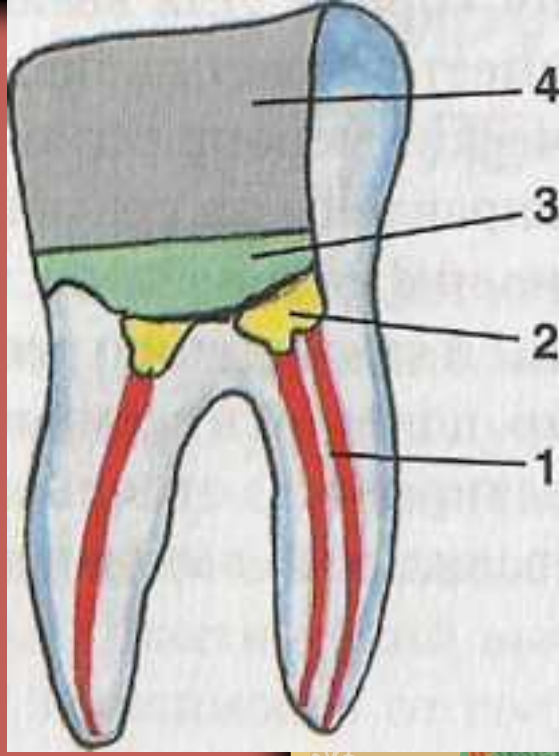


Mummification - the full dehydration of a tissue. After mummification the pulp transform into in dryed up filament with the fixed frame which does not decay.

Mummificating pastes causes mummification of pulp stump and thus prevent the further diffusion of inflammatory process to periodont. They promptly penetrate into pulp, causes coagulation of proteins of its tissue, and have prolonged antiseptic properties. To this group concern Resorcinum-formalin paste prepared ex tempore, Tricresolum-formalin paste, «Креодент» (Russia), «Форедент» (Czechia), etc.

Metaplasic pastes. The basic mechanism of their activity is metamorphosis of the inflamed tissue of root pulp into an ossiform tissue. The most widespread are pastes with thymolum, iodoformium, Phenolum (acidum carbolicum).

The second visitation



9. Insertion of isolating lining.
10. Closure of tooth by temporary, then (in 7-10 days) constant filling.

Application for coating of pulp with pastes of so-called biological effect (with antibiotics, hormones, ferments) **is not admissible**, as they are destined for conservation of vital activity of pulp, but at devital method it is considerably affected by devital agents and is not capable to recover the vital activity.

Now devital amputating method does not find wide application in practice in connection with narrow indications and frequent arising serious complications. So, after devital amputation Kodola N.A. and co-authors (1980) observed complications at 85 % of patients: in the form of residual pulpitis (13 %), acute periodontitis (7 %), exacerbation of chronic periodontitis (12 %) ect.

Devital combined method

The method provides removal preliminary destroyed crown and root pulp from permeable root canals and its mummification in impermeable canals.

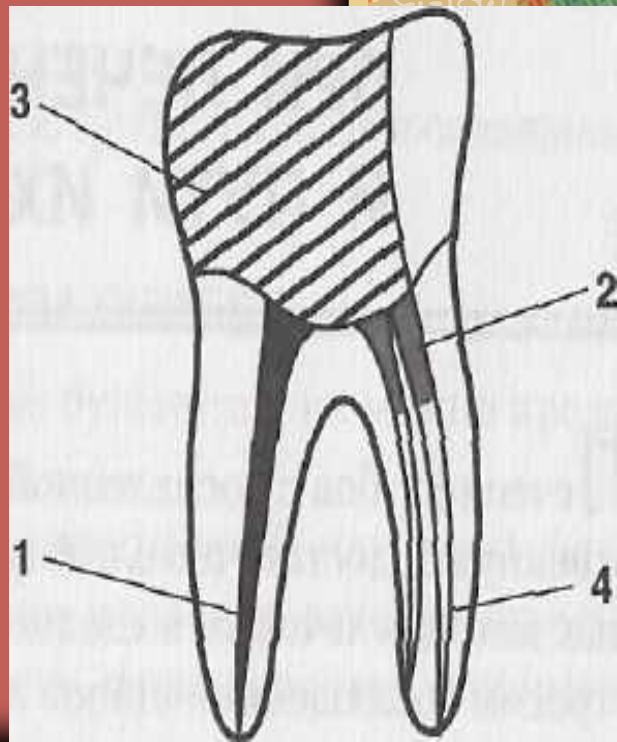
- **Indications to application:**

Only for multiroot teeth with curved or impermeable 1 or 2 canals!

- **Contraindications:**

✓ single-root teeth (frontal teeth), because of teeth dyeing (from pink to brick colour).

✓ Teeth with permeable canals.



Devital combined method

- In I visitation pulp devitalization is carried out.
- In II visitation the first 5 stages same as at amputation or an extirpation.Then:

6. Extirpation of pulp (completely removing of dead pulp) from the permeable canal (the distal canal of mandible molar or the palatal canal of maxilla molar);
7. Medicamental and instrumental processing of root canal;
8. Filling of canal with help of any method to apical foramen of tooth root.

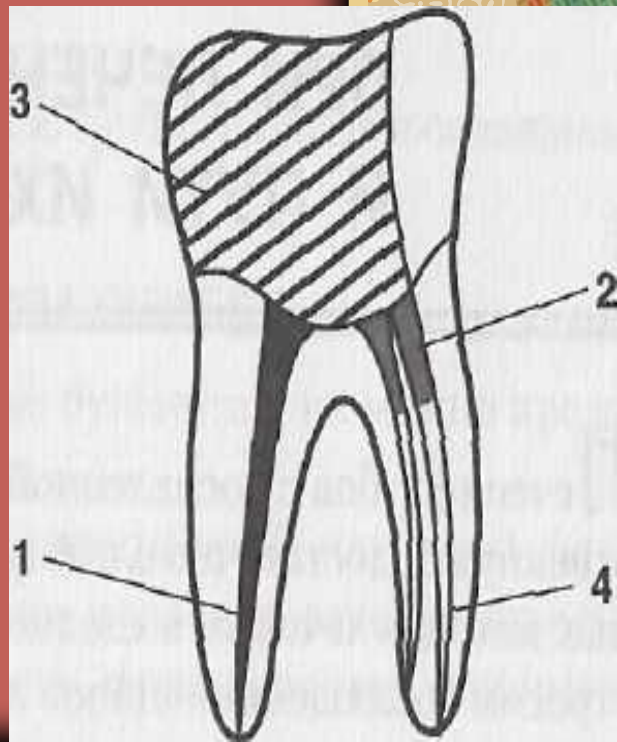
Devital combined method

9. Mummification of the dead pulp in curved or impermeable canals (coat by mummificating liquid and then paste).

10. Temporary filling of crown cavities.

In 7-10 days if complaints are absent then temporary filling will be changed to per - manent filling

.



THANK’S
FOR ATTENTION!