Endodontics I.
Case selection and treatment planning

Common medical findings that may influence endodontic treatment planning

- Pregnancy
- Cardiovaslular disease
- Cancer
- HIV and acuired immunodeficiency syndrome
- End stage renal disease
- Dialysis
- Diabetes
- Prosthetic implants
- Patients with anticoagulation therapy
- Behavioral and psychiatric disorders

- Pregnancy is not a contraindication to endodontics but it does modify treatment planning.
- Consult a physician iif you are not sure.
- Ragiography If possible NO!!! Lead apron and thyroid collar
- Drugs Antibiotics (penicilin, cephalosporin, clarithromycin - all with caution !)
- Analgetics (paracetamol – with caution!)
- Local anaestetics (first if possible no in emergency with caution yes, second trimesters YES, third trimester with caution – a risk of contractions).

Cardiovascular disease

- Vulnerability to emotional and physical or stress during dental treatment including endodontics.
- Consultation with the patient´s physician is mandatory before the initiation of endodontic treatment if within 6 month after the attack.

Patients who have had heart attack (myocardial infarcation) within 6 month should not have elective dental care.

Medication can potentially interact with vasoconstrictors in LA Increased susceptibility to repeat the heart attack.

No administration:

- Patients with non stable angina pectoris
- Uncontrolled hypertension
- Refractory arythmia
- Recent myocardial infarction (less than 6 month)
- Recent stroke (less than 6 month)
- Recent coronary bypass graft (less than 3 month)
- Uncontrolled congestive heart failure
- Uncontrolled hyperthyreoidism

- Risk of bacterial endocarditis Caused by a bacteremia – can be associated with endodontic treatment. It is potentially fatal. - Patients who have a history
- of murmur or mitral valve prolapse with regurgitation
- Rheumatic fever
- Congenital heart defect
- Arteficial heart valves

- Risk of bacterial endocarditis must be minimized using

- ANTIBIOTIC PROPHYLAXIS

- Short term administration of antibiotic in high dosage – according to recent recommendation.

Cancer

- Risk of metastasis in jaws. Careful examination, OPG.
- Cancer in orofacial region - all potential focuses must be removed, no endodontic treatment during and after radiotherapy.
- Risk of radionecrosis – radioosteomyelitis.

Radiotherapy - decreasing number of osteoblasts, osteocyts, endothelial cells and blood flow. Routine dental procedures can be done if granulocyts counts is grater than 2000/mm3 platelet count grater than 50.000/mm3. Consultation with responsible specialist.

- HIV and aquired immunodeficiency syndrome
  HIV patients do not have an increased risk of postoperative pain or inflammation.
  Precautions of infection of dental team.

- Generally – number of CD4 lymphocyts is important (less than 200/mm3 hihger risk of opportunistic infections).

Renal disease and dialysis

- End stage renal disease – best way hospital setting.
- Dialysis – consultation wsith the specialist (some drugs are eliminated by dialysis, the treatment is best scheduled a day after dialysis since on the day of dialysis patients are generally fatiogued and have a bleeding tendency)

Diabetes

- Patients with well medically controlled diabetes and free of serious complications (renal disease, hypertension, coronary atherosclerotic disease) is a candidate for endodontic treatment.
- Non insulin patient may require insulin
- Insulin patient may require hihger dosis of insulin
- Source of glucosa should be available
- - Appointments should be scheduled with consideration given to the patientś normal meal and insulin schedule.
- Especially when surgical endodontics is indicated – consultation with specialist is useful.

Prosthetic implant

- Can require antibiotics prophylaxis depending on time after implantation and other patient´s diseases.
- Consultation with patient´s physician.
- Endodontic is an unlikely cause the bacteremia in comparison with extractions, scaling, periodontal surgery.

Patients with anticoagulation therapy

- Risk of bleeding from dental pulp and root canal
-
- Risk of haematoma when nerve blocking anaesthesia is used.

- Treatment depending on laboratory tests, consultation with specialist.

Behavioral and psychiatric disorders

Patient´s ability of cooperation and drug interaction (local anaesthetics)

Consultation of physician usefull and sometimes necessary.

Regional factors that influence endodontic case selection

Position of the tooth and its importance for function

- The tooth must be valuable for the function (no endo in dystopic teeth,third molars etc..

- Local factors that may influence endodontic case selection

Periodontal consideration (poor periodontal prognosis – no endodontic treatment)

- Surgical consideration (some lesions are nonodontogenic)
- Restorative consideration (root intraosseus caries, poor crown/root ratio, extensive periodontal defects)
- Others (calcification, obliteration,root resorption, dilaceration etc.)

Biological width

- Distance between free gingiva and alveolar bone (at least 2 mm)
- Distance between the botom of the gingival sulcus and alveolar bone (at least 1 mm)

Ferrule effect

- Hard dental tissues supragingivally – at least 2 mm
- The thickness of hard dental tissues circulary 1,5 mm before endodontic treatment.

Non restorable teeth

- Elongation of clinical crown surgically
-
- Orthodontic or surgical extrusion
-
- Extraction

Diagnosis in endodontics

- Chief complaint
- Medical history
- Dental history
- History of present dental problem

- Dental history interview
- Questionnaire

Examination and testing

- Extraoral examination

Inspection: facial symetry, loss of definition of the nasolabial fold
Palpation: cervical and submandibular lymph nodes)

- Intraoral examination

Inspection: and probing: soft tissue examination, intraoral swelling intraoral sinus tract
Palpation
Percussion
Mobility
Periodontal examination

Examination and testing

- Pulp sensitivity test

➢ Thermal

- Cold sensitivity test

Tetrafluorethan (Cognoscin)

CO_2 stick

Ice stick

- Hot sensitivity test

Special probe (a part of some obturations units)

Preparation with rubber cup – without water cooling

Thermoplastic impression material

➢ Electric probe

Not reliable

Radiographic examination

- Intraoral radiography
- Film or sensor placed in oral cavity –
- Special apparatus

Structures observed:

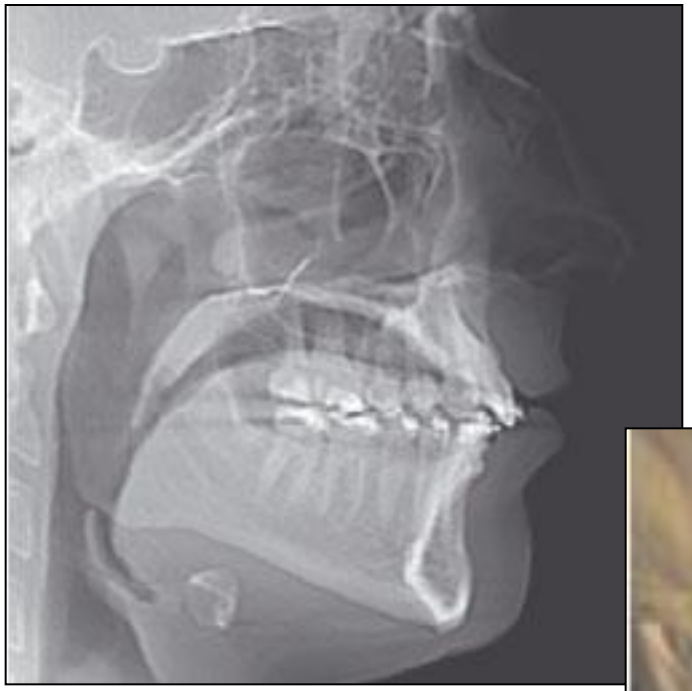
- Teeth
- Alveolar bone
- Periodontal space
- Fillings
- Caries
- Impacted teeth
- Level of endodontic treatment

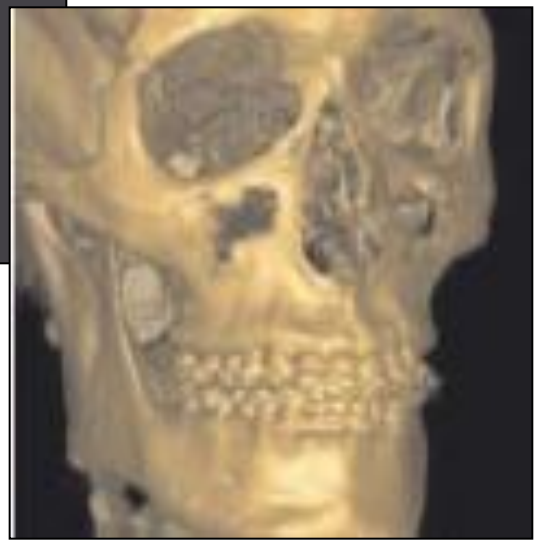
- Position of the tube
- In vertical plane
- In horizontal plane

- Parallelling gtechnique
- Modified parallelling technique
- Bissecting angle technique

See the presentation Radiography or pdf presentation Endodontics Ia

CBCT





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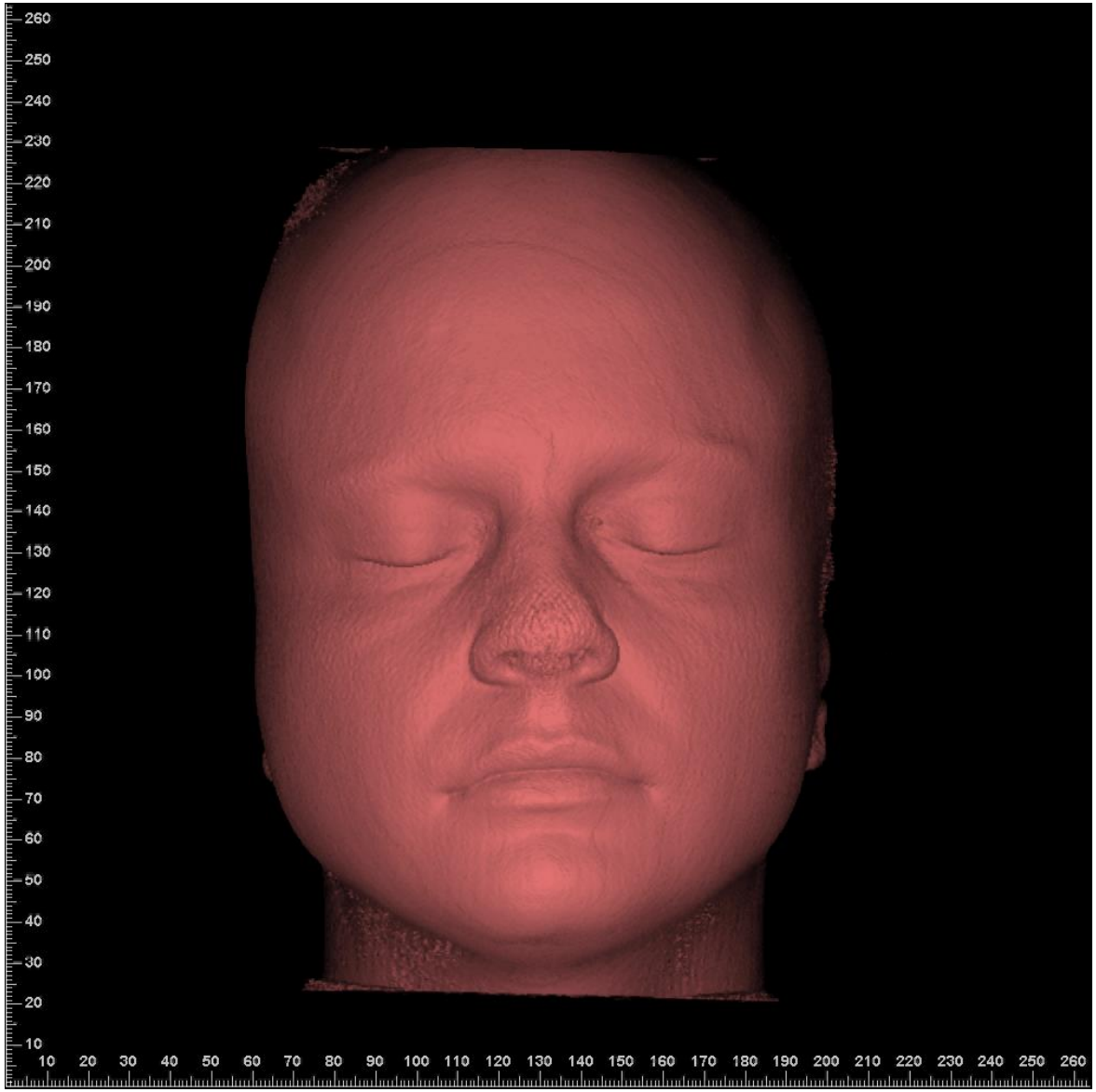

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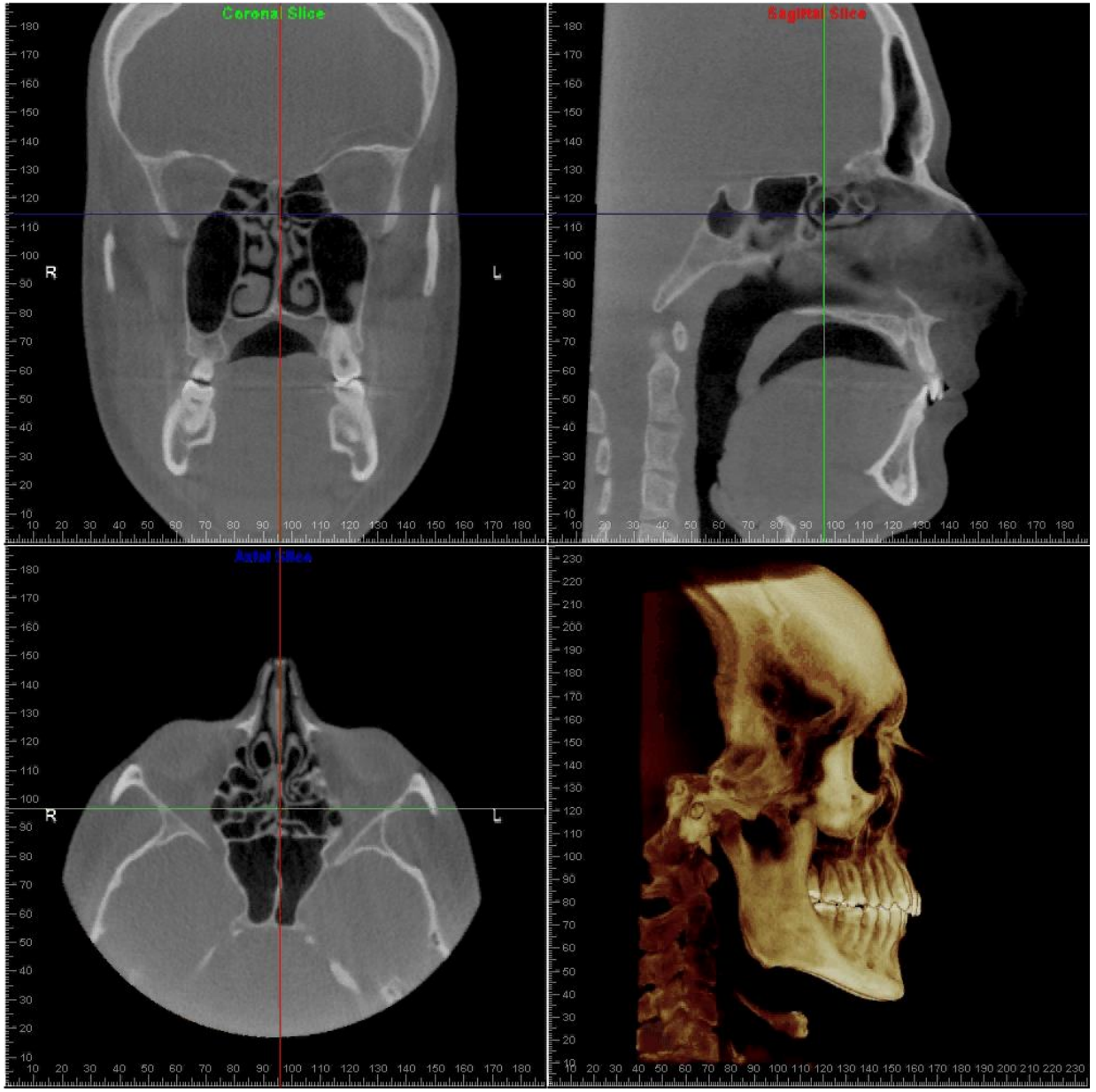

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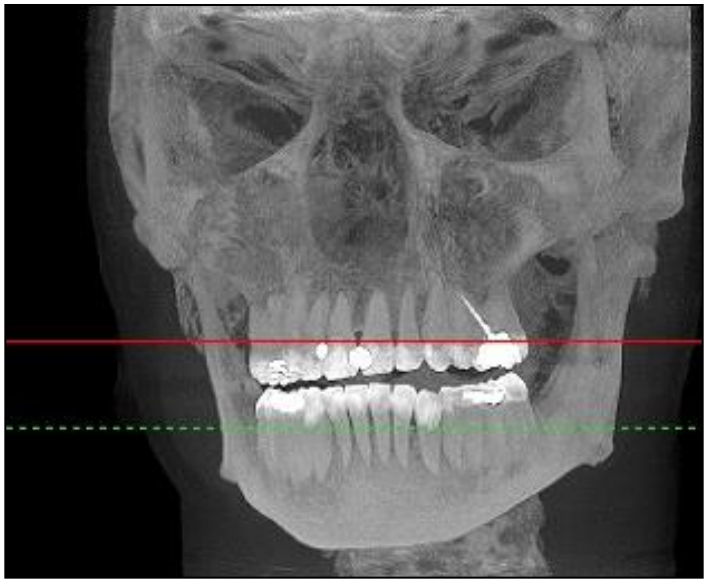

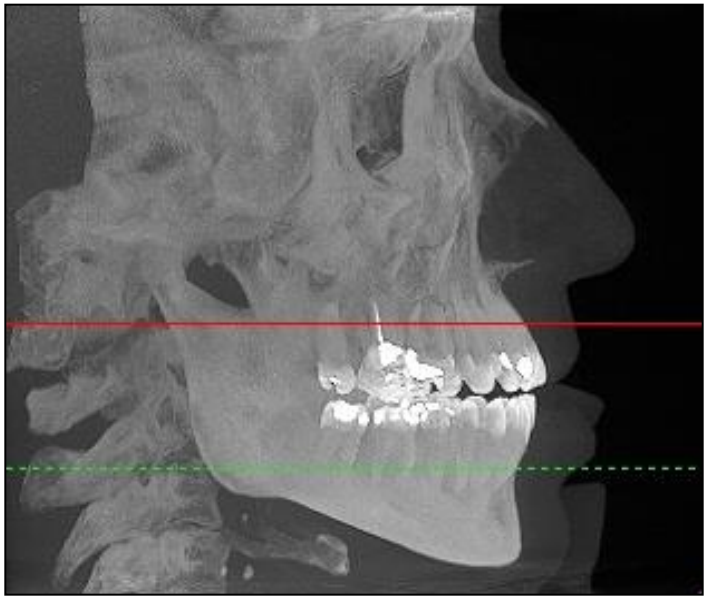

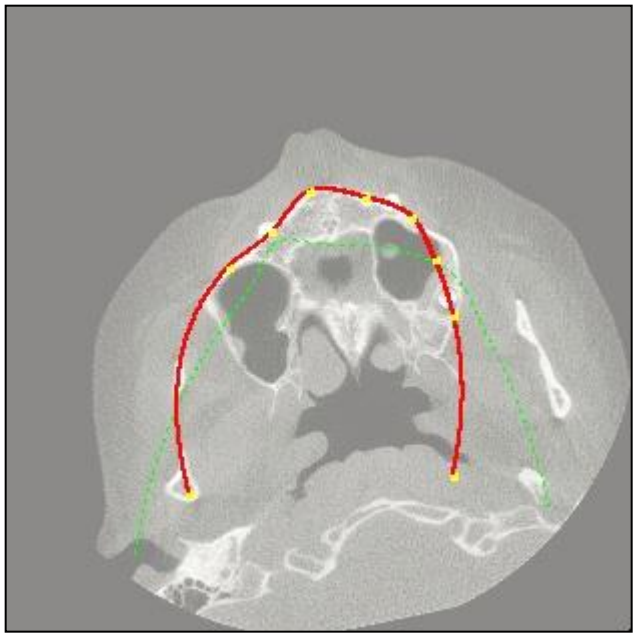

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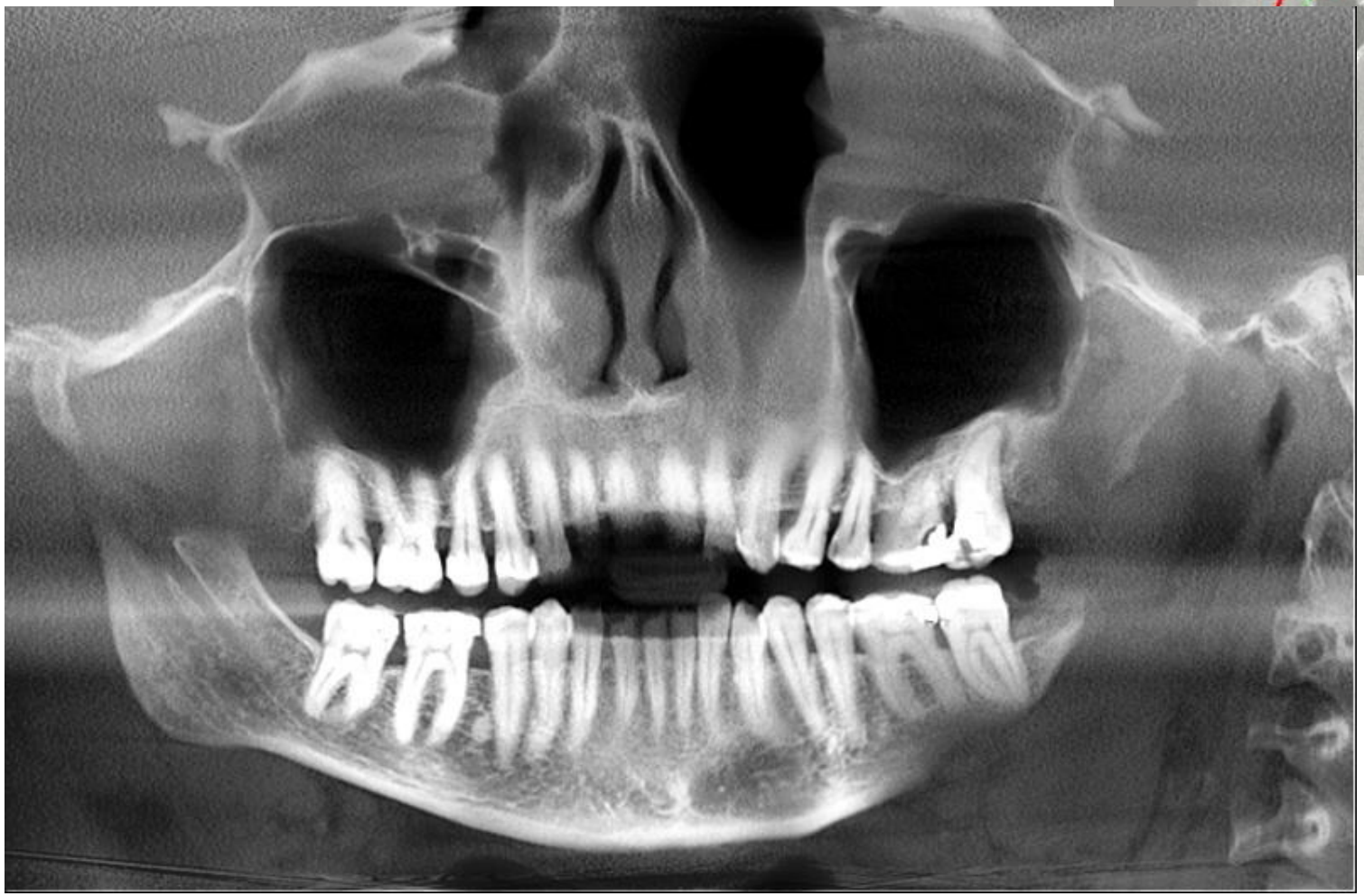

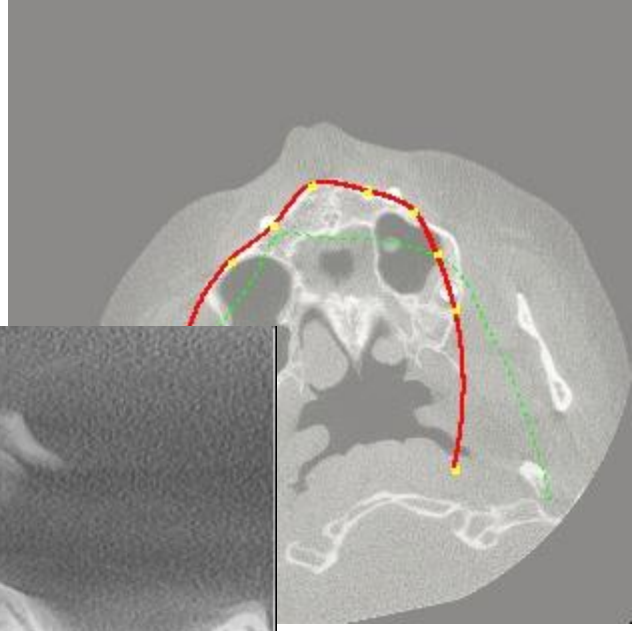

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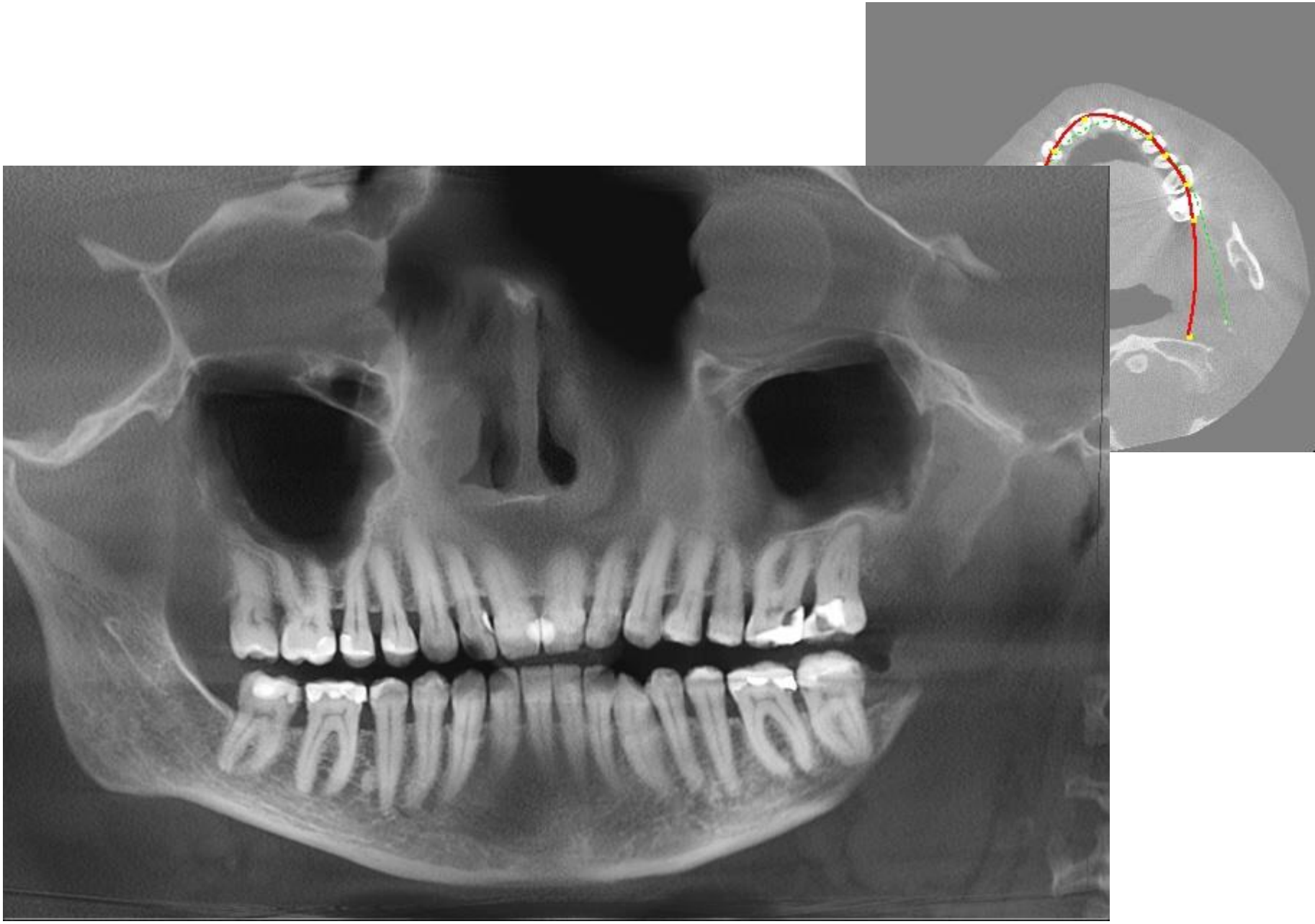

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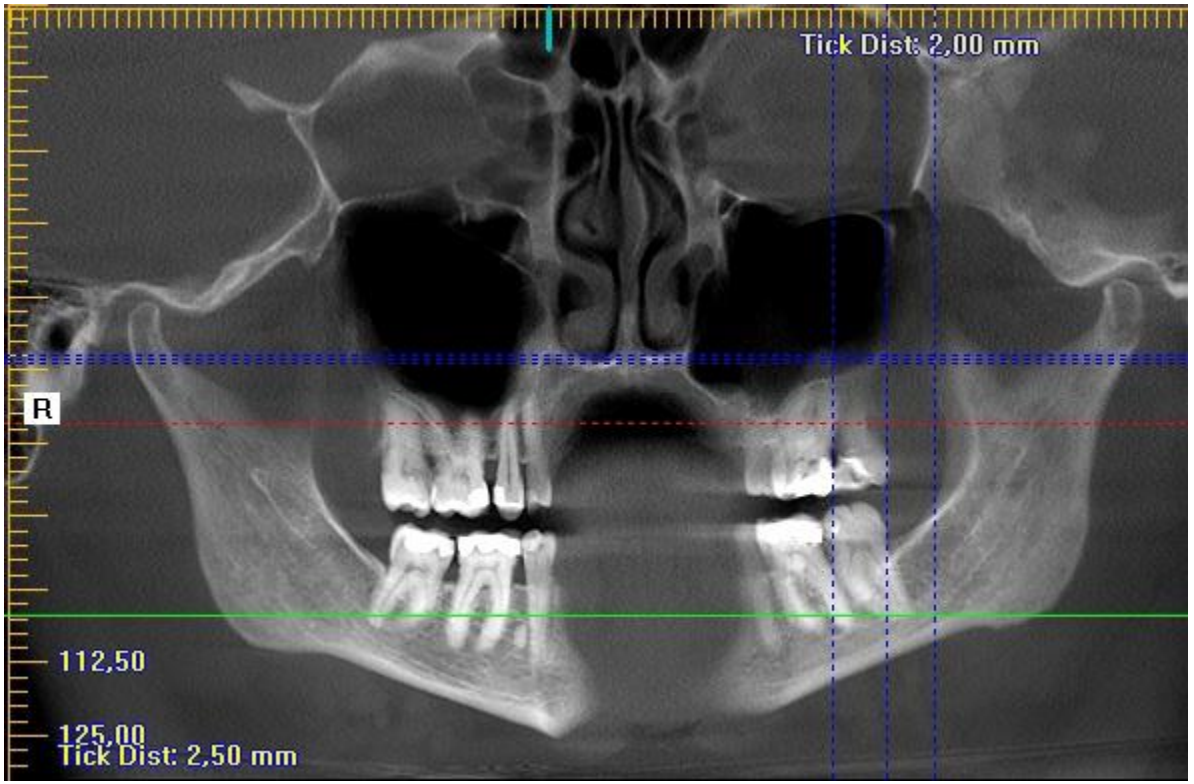

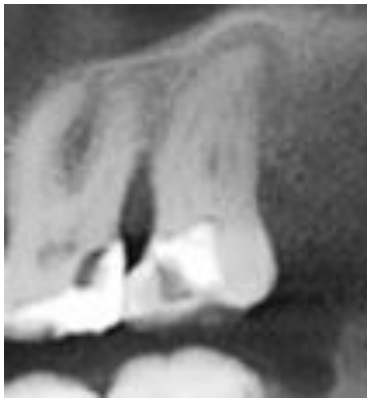

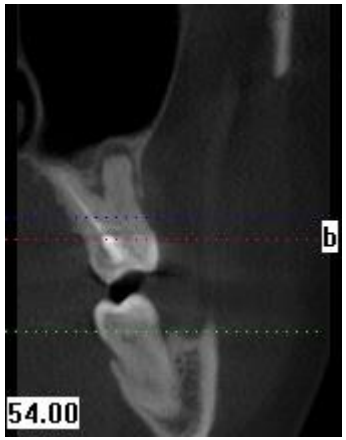

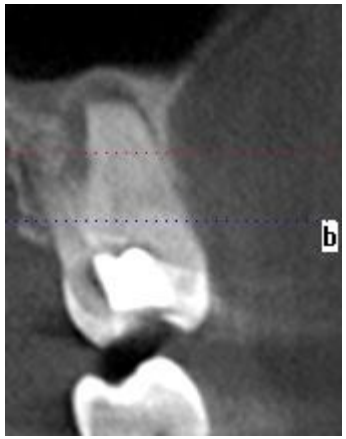

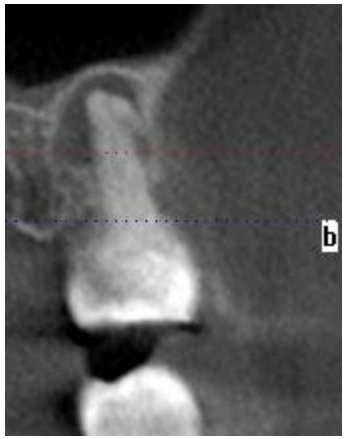

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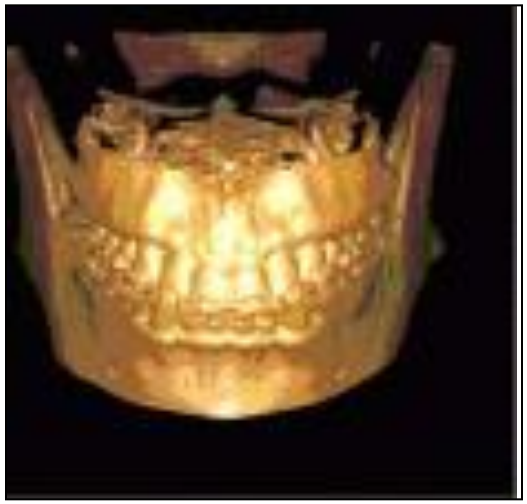

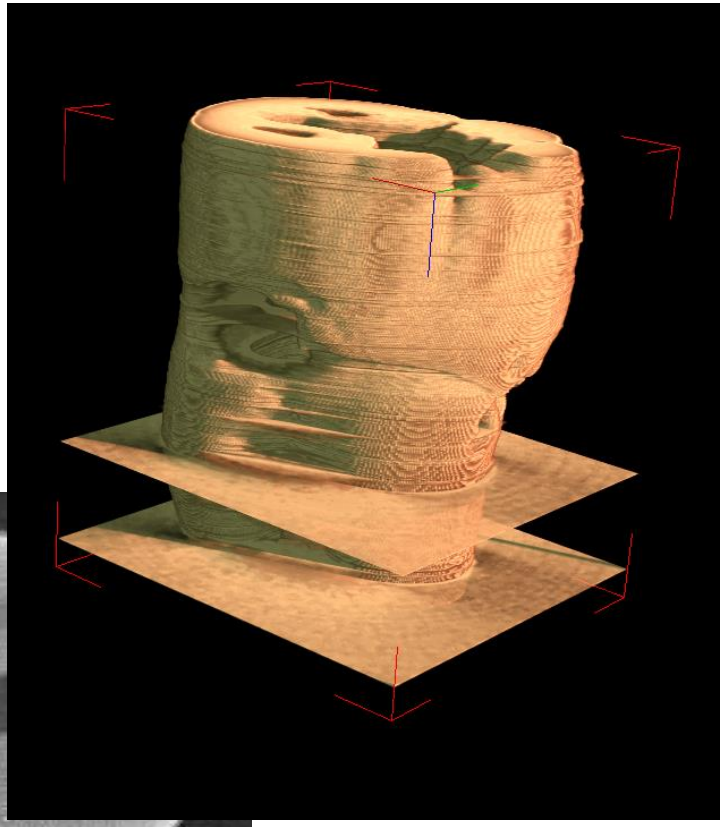

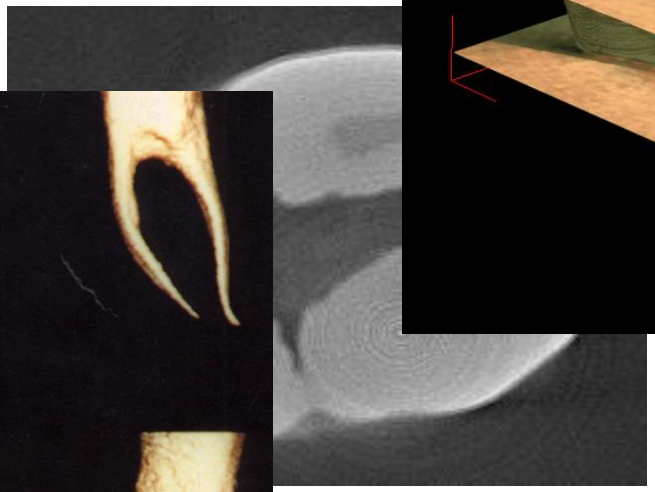

Clinical classification od pulpal and periapical diseases

Pulp diseases:

- Normal pulp
- Reversible pulpitis
- Irreversible pulpitis
- Necrosis
- Periodontal diseases
- Periradicular periodontitis (chronic apical periodontitis)
- Periradicular abscess (acute apical periodontitis)

Pulpal status

- Normal pulp – no spontaneus symtoms, the pulp responds to pulp tests, symptoms are mild, do not cause patient´s discomfort. Transient sensation reversing in seconds.
- Reversible pulpitis - stimulation is uncomfortable, sharp pain,revers quickly after irritation. (minutes) Findings: dental caries, recent dental treatment , exposed dentin, defective restoration

- Irreversible pulpitis

Symptomatic

– Intermittent spontaneus pain

- Pain on stimuli asp. cold – stimul can cause an attack of pain
- Pain is sharp or dull, usually referred
- Patient can hardly recognise which tooth is causative, later the tooth can be localised

- Pain during the night
- During the time the attacks are longer
- the stimuli are less on cold but more on hot
- during time the patient can recognize the causative tooth
- X ray negative or widened periodontal ligament space. (Thickening of periodontal membrane)

Chronic pulpitis - irreversible

- Asymptomatic
- Can become symptomatic or necrotic

- Necrosis and gangraena
- Necrosis
- Asymptomatic
- no response on vitality test
- less translucency
- no findings in radiogram
- Necrotic pulp become very often gangrenous
- no symptoms
- no response on vitality cold tests
- pain on hot
- typical smell (gangraena can be open or closed)
- discoloration can be fomund
- no radiographic finding

Periapical diseases

- Apical periodontitis (periradicular periodontitis)

Chronic: no symptoms, no response on vitality tests, periapical radiolucency. Can become acute (flare up - exacerbation)

Acute: Symptomatic – pain is well localised,

- pain on percussion, bite, hot, palpation, mobility.
- no respons on vitality cold tests.
- X ray widened periodontal ligament space.
- in the case of the flare up – periapical radiolucency.

Consequences of periapical diseases

- Can propagate intraorally or/and extraorally

Intraorally:

- Subperiostal abscess
- Submucous abscess

Extraorally

- Abscess in surrounding tissues
- Non limited inflammation - cellulitis

Endodontic treatment

- Vital methods: dental pulp or its part remain vital

IPT, VPT

- Non vital methods – root canal treatment

RCT

Classification of pulpitis based on clinical symptoms (Hashem 2015)

- Mild reversible pulpitis
- Patient´s description of sensitivity to hot, cold and sweet lasting up to 15-20 s and settling spontaneusly
- Severe reversible pulpitis
- Increased pain for more than several minutes and needing oral analgesics
- Irreversible pulpitis

- Persistent dull throbbing pain and tenderness to percussion or pain exacerbated by lying down

New classification od pulpitis (Wolters, Duncan 2017)

- Initial pulpitis

- Hihgtened but not lenghtened response to the cold test, nor sensitive to percussion and no spontaneus pain. Therapy IPT (indirect pulp therapy)

- Mild pulpitis

- Hightened and lenghtened reaction to cold, warmth and sweet stimuli than can last up to 20s (limited local imflammation confined to the crown pulp). Therapy IPT

New classification od pulpitis (Wolters, Duncan)

- Moderate pulpitis

Clear symptoms, strong, heightened and prolonged reaction to cold, which can last for minutes, possibly percussion sensitive and spontaneus dull pain that can be more and less suppresed with pain medication.

It would be implied that there is extensive local inflammation confined to the crown pulp.

Therapy: coronal pulpotomy partly/completely

New classification od pulpitis (Wolters, Duncan)

- Severe pulpitis

Severe spontaneus pain and clear pain reaction to warmth and cold stimuli, often sharp to dull throbbing pain, patienrs have trouble sleeping because fo the pain (get worse when luyion down). The tooth is sensitive to touch and percussion.

It would be implied that there is extensive local inflammationin the crown pulp that possibly extends into the root canals.

New classification od pulpitis (Wolters, Duncan)

- Severe pulpitis

Therapy:

Coronal pulotomy (no prolonged bleeding of pulp stumps in the orifices of the root canals).

If bleeding persists after rinsing with 2 ml 2% NaOCl, a superficial pulpotomy can be carried out (3-4 mm from the x-ray apex).

If bleeding persists – puplectomy and RCT.

Endolight – the minimally invasive endodontic approach

- Benefits

- Maintaining the viability of dental pulp as long as possible to induce a biological response (prevention of apical periodontitis)
- Saving tooth structure – increasing tooth survival
- Saving time and cost for patient and society
- Reducing pain and discomfort for the patient and keeping teeth functional for longer