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Emergency medicine in dental surgery. Emergencies in the dental practice. Management of "high-risk" patients.

Many different kind of illnesses can cause „emergency” in the dental practice.

These diseases have:

- different etiology**
- different symptoms**
- different therapy**

Their common characteristic is fast evolution.

Differential diagnose and sometimes the prompt treatment is very important!

The most common diseases

1. Panic disorder

2. Vascular and cardiac laesions:

- **collapse**
- **allergies**
- **arrythmies**
- **cardiac insufficiency**
- **hypertonic attack**
- **angina pectoris**
- **myocardial infarction**

3. Diseases of carbohydrate and hormonal metabolism:

- **diabetes mellitus (hypo-, hyperglycemia)**
- **hyperthyreosis (hyperthyreotic crisis)**

4. Diseases of central nerve system:

- **epilepsy**

5. Failure of respiratory system:

- **asthma bronchiale**

6. Haematologic diseases

- **bleeding**

7. Accidents:

- **aspiration**

The prompt differential diagnose is very important!!

1. What can be the cause of the disease?

- **Comprehensive anamnesis: before starting any intervention!!**
 - **diseases of lung, liver, kidney, heart, etc...**
 - **diseases of carbohydrate/hormonal metabolism**
 - **haematologic diseases (haemophilia?INR?)**

- **Regularly used medication?**

- **Allergies? (local anaesthetics?iodine?)**

2. Examination: check the vital signs!

- **Breathing: frequency of breathing, free respiratory tract? foreign body?**

- **Circulation: periferial?, central?, heart sounds?, heart frequency?**

→ **absence of breathing and circulation: start reanimation!**

→ **good vital signs: measure blood pressure-, blood sugar, etc... use some treatment and ask for help!**

3. Decide: where can the patient be treated?

- **ambulatory?**

- **hospital?**

Panic disorder

Definition: A panic attack is a sudden surge of overwhelming anxiety and fear. Women are twice as likely as men to develop the condition.

Symptoms:

- feeling weak, faint, or dizzy
- tense, anxious patient
- chest pains
- breathing difficulties
- regular pulse („Racing heart”)
- warm or flushed skin
- pupillary reactions are normal
- feeling a loss of control

Medication usually is not necessary

Prevention: with sedatives, psychotherapy, general anaesthesia - if needed



Collapse, syncope

Definition: reflexogenic blood pressure decreasing (besides sufficient heart function!) which leads to unconsciousness mostly in young patients.

Causes: pain

stress

fear

asthenia

anaemia

disability

sight of blood and instruments

previous uncomfortable experience

gravidity



Collapse, syncope

- Symptoms:**
- weakness
 - dizziness
 - very pale, wet skin
 - pulse: quick, later slow
 - breathing: quick, later slow
 - effective circulation
 - short unconsciousness

In the differential diagnosis may help the sufficient circulation and the normal pupillary reaction.

Prevention:

- quiet, peaceful circumstances
- patient dentist and assistant
- inform the patient before the intervention!
- praemedication: with sedatives

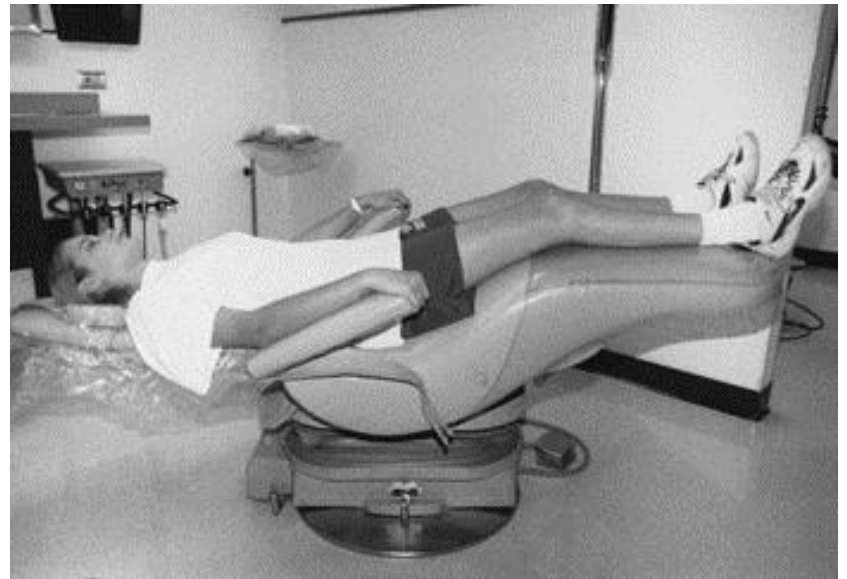
Medication usually is not necessary (by vagotonia: Atropin 0,2-0,4 mg)

Collapse, syncope

Therapy:

- lay down the patient and lift up the feet (Trendelenburg position)
- open the window
- put some cold, wet cloth on the forehead

Trendelenburg position →



Heart - insufficiency

Definition: decompensation of left - or right heart ventricle because of stress, medicaments or blood pressure increasing which leads to the collapse of circulation.

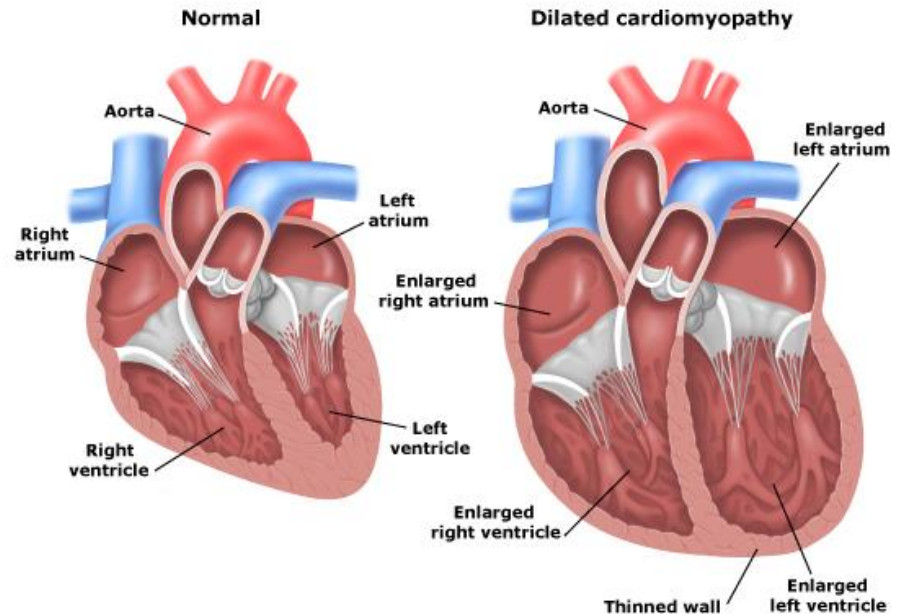
Usually known disease!

Symptoms:

- asphyxia
- chest pain
- cyanosis
- arrhythmia
- anasarca
- distended neck veins

Medication: diuretics, diaphyllin, antihypertensives, analgetics

Call the ambulance!!!



Heart - insufficiency



anasarca



distended neck veins

Hypertensive crisis

Definiton: 180/110 Hgmm <

Hypertony is usually known!

Symptoms:

- **pain the back of the head**
- **giddiness**
- **neurological symptoms**
- **tinnitus**

→ Blood pressure controll!!

→ Medication: captopril (Tensiomin), nifedipin (Cordaflex) per os, or Ebrantyl iv.

If the blood pressure is stabilized about 150/100 Hgmm, the treatment is enough.

Call the ambulance when blood pressure can not be reduced, or the patient have neurological symptoms (trouble in speaking, paralysis occur)!!!

Blood Pressure Category	Systolic		Diastolic
Normal	less than 120	and	less than 80
Prehypertension	120 – 139	or	80 – 89
High Blood Pressure (Hypertension) Stage 1	140 – 159	or	90 – 99
High Blood Pressure (Hypertension) Stage 2	160 or higher	or	100 or higher
Hypertensive Crisis (Emergency care needed)	Higher than 180	or	Higher than 110

Angina pectoris

Symptoms: • acute, strong, substernal pain

- pain in the left chest
- referred pain into the neck, left arm, mandible or teeth
- circulation and breathing is intact

Therapy:

→ **Check blood pressure**

→ **Medication: nitroglycerin (Nitromint) pill or spray (to reduce the prae- and afterload of heart)**

Call the ambulance!!!

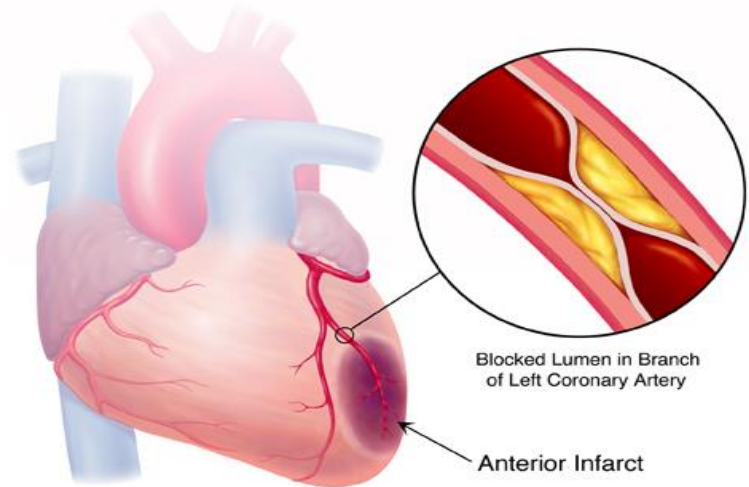


Myocardial infarction

Definition: commonly known as a heart attack, is the irreversible necrosis of heart muscle secondary to prolonged ischemia.

Symptoms: • very strong chest pain (nitroglicerine is ineffective!), referred pain into the neck, left arm, mandible or teeth

- restless
- sweating
- mortal fear
- hypotonia, arrhythmias



Therapy: MONA (morphine, oxygen, nitroglycerin, ASA)

Call the ambulance!!!

Allergy, anaphylaxy

Definition: Antigen - antibody reaction after the administration of local anaesthetics or other dental substances.

Characteristics: extreme hystaminic delivery

extreme vasoparalysis

growing of capillare permeability

„circulus vitiosus”

Symptoms:

• urticaria	• itching
• indisposition	• mortal fear
• nausea	• failure in sawallowing
• dyspnoe, stridor	• shock
• low bloodpressure	• syncope
• bradycardia	• collapse of circulation
• flushing oedema of the mucous membranes	



Allergy, anaphylaxy

Therapy: • skin symptoms: antihistamins

• oedema of mucous membranes: + steroids

• low blood pressure, hoarseness, dyspnoe: + **TONOGEN!!!**

Call the ambulance!!!

→ **Adrenalin (vasoconstrictor):**

- increases blood - pressure
- reduces oedema of mucous membranes
- bronchodilatator



Add 1 mg/ml adrenalin to 9 ml saline (inject 3 ml slowly intravenous)!

Adrenalin intoxication

- Cause:**
- **exogenic : stress, fear**
 - **endogenic: intravasale injection**



Symptoms:

- | | |
|-------------------------------------|--|
| • in slight case: tachycardy | • in serious case: pale, waxed skin |
| fear | excited state |
| feeling of collapse | extreme tachycardia |
| headache | blood pressure increasing |
| blood pressure increasing | arrhythmias |
| tinnitus | ventricular extrasystoles |
| | fibrillation |

Adrenalin intoxication

Therapy: • stop administering the injection

• give 100% oxygen

Call ambulance urgently!!!

Prevention: inject slowly!

retraction of syringe!

stress reduction!



Adrenalin intoxication

Adrenalin injection is contraindicated:

Hypertony: 160/100Hgmm <

Coronary insufficiency

Myocardial infarction in 6 months

Therapy resistant arrhythmias

Hyperthyreosis (untreated!)

Frequent angina pectoris

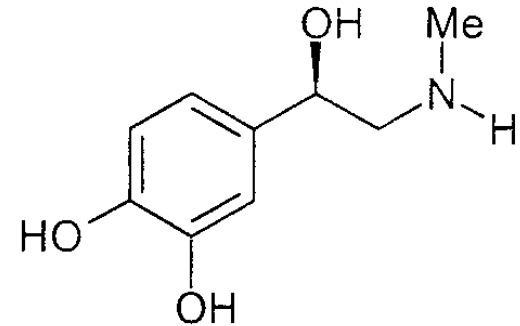
Apoplexy in 6 months

The maximum dose of adrenalin:

Inj. Lidocain-Adrenalin 2%: 20ml (0,01mg adrenalin/ml) - 10 ampoule!

→ healthy patient: 0,2 mg

→ coronar – insufficient patient: 0,04 mg - 2 ampoule!



Adrenalin

Toxic effects of local anaesthetics

1. Fast development:

- after intravasale injection
- if the absorbtion is too rapid
- a lot of injection



2. Slow development: local anaesthetics are cumulated

The cause: • slow detoxication: liver lesion

- slow secretion: kidney lesion

Toxic effects of local anaesthetics

Symptoms:

1. Excitement of central nerve system:

restless

troubles in sight, audition, speaking

nausea, vomitus

fasciculation, clonic convulsions

blood pressure increasing

tachycardia

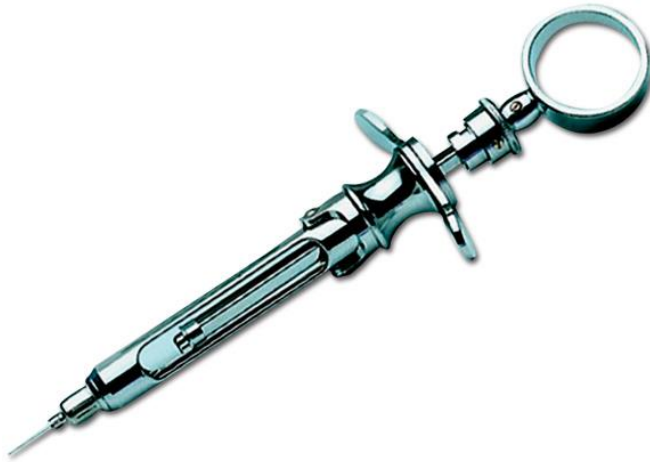
dyspnoea, cyanosis

2. Paralysis of central nerve system:

unconsciousness

respiratory paralysis

collapse of circulation



Toxic effects of local anaesthetics

Therapy: the most important is the prevention!

- **don't inject intravasale!**
- **don't use too much local anaesthetics!**
- **use general anaesthesia - if it's necessary!**

If the symptoms develop: intravenous cannulation

sedatives (midazolam)

O₂inhalation

CPR

Call the ambulance!!!

Asthma bronchiale

Definition: a chronic lung disorder that is marked by recurring episodes of airway obstruction.

Anamnesis!

Cause is the stress and fear

Characteristic: Short inspiration and the long, struggled expiration

Therapy: patient own medicaments (Berodual, Salbutamol)

steroids

diaphyllin iv.

Prevention: Benzodiazepines



Hypoglycaemia

Anamnesis: • diabetes mellitus (glucose cc. $< 3,3$ mmol/l)

• healthy patients: diet, gravidity, PMS

Symptoms: faint

exhaustion

tachycardia

pale skin

sweating

Therapy: check blood sugar

sugar per os

Inj. Glucosum (40%)

Unconsciousness → Call the ambulance!!



Hyperglycaemia

Anamnesis: diabetes mellitus (glucose cc. 6,1mmol/l<)

Cause: inflammation, stress, adrenalin, noncompliance

→ increased blood sugar level

Symptoms: very dry, warm skin and tongue

exhaustion

lack of appetite

sleepiness

apathy

acetonis breath!!

Call the ambulance!!!



Epilepsy

Epilepsy is a central nervous system disorder (neurological disorder) in which nerve cell activity in the brain becomes disrupted, causing seizures or periods of unusual behavior, sensations and sometimes loss of consciousness.

Usually known (anamnesis!)

Cause is the stress and fear

Symptoms: unconsciousness

toniclonic convulsions

somnolency after the attack

Therapy: diazepam (Seduxen) → slowly, intravenous 3-5 mg

Call the ambulance!



Hyperthyreosis:

Definition: the increased function of thyroid gland.

It is contraindicated to administer adrenalin in unattended cases!!!

Symptoms: in the anamnesis: low fever, losing weight

nervousness, irritation

muscle tremors

arrhythmias

hypertonia

sweating

exophthalmus

Therapy: sedatives

Call the ambulance!!



Aspiration

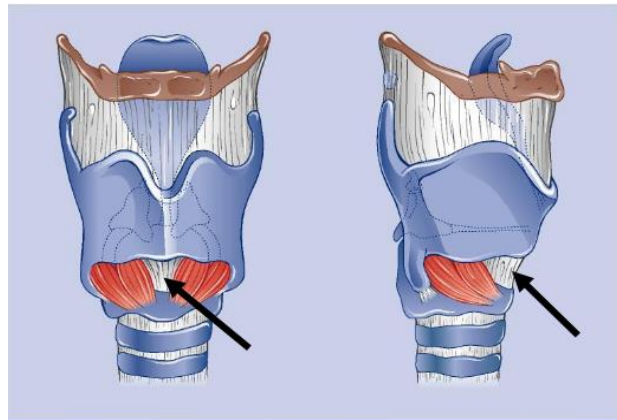
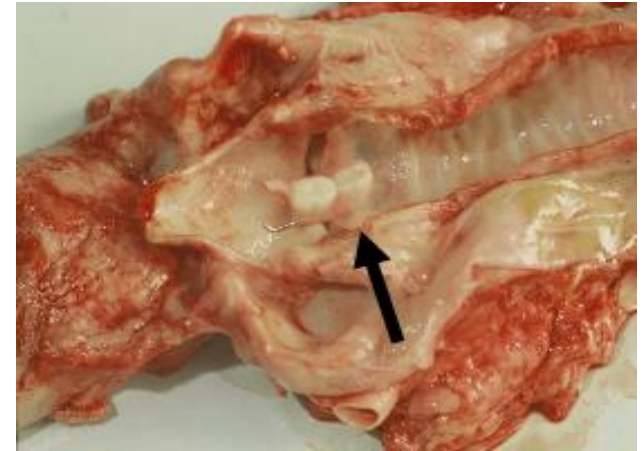
- Needles, cotton rolls, crowns, teeth, etc...

→ Heimlich maneuver (remove foreign body)

→ intubation, conicotomy (asphyxia!)

→ BLS!

Call the ambulance!!



Bleeding

- **Anamnesis!!!! (haemophilia, cirrhosis, coagulation inhibitors?)**
- **Always ask for the medication!**
- **Document carefully!**
- **Inform the patient properly!**
- **Ask for lab tests if needed!**
- **The patient always has to sign the inform consent before the treatment!**
- **Delay the treatment, if you are not sure...**
- **Send the patient to specialist in time!!!**



Some tips to avoid „emergencies”

- **Try to decrease stress!**
- **Try to earn the patient's trust**
- **Give enough information**
- **Comprehensive anamnesis!!! Ask directly!**
- **If the circumstances are not appropriate, delay the intervention!**
- **Ask for help in time!!**

Minimum conditions in dentistry (emergency equipments)

- **AMBU balloon**
- **Suction equipment**
- **Injections, syringes, needles**
- **Tonogen inj.**
- **Atropin inj.**
- **Calcimusc inj.**
- **Oradexon, Hydro-Adreson inj.**
- **Suprastin tabl. and inj.**
- **Pipolphen tabl and inj.**
- **Diaphyllin inj.**
- **Nitromint tabl. and spray**
- **Corinfar tabl.**
- **Cordaflex tabl. and spray**
- **Seduxen tabl. and inj.**
- **Dormicum tabl. and inj.**
- **Phonendoscope**
- **Haemadynamometer**

**Thank You for Your
attention!**