



Emergencies in oncology

Prof. Dank Magdolna
SE Oncology Centre

What wil we talk about?

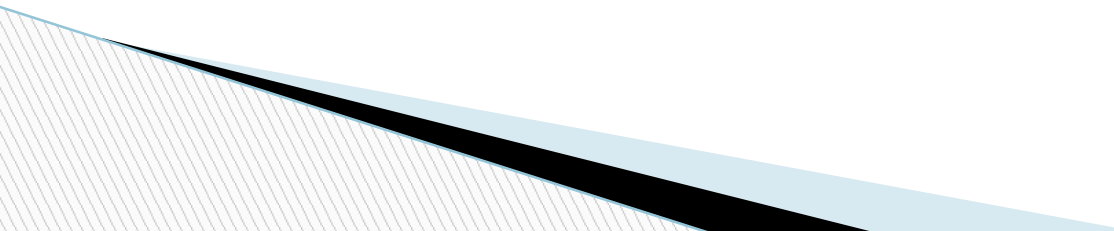
- Febrile neutropenia
 - Superior vena cava syndrome
 - Cardiac tamponade
 - Hypercalcaemia
 - Tumor lysis syndrome
 - Spinal cord compression
- 

Febrile neutropenia

▶ Definition :

Oral temperature is above $38,3\text{ C}^0$, or above 38 C^0 taken twice in a 2 hour period , AND

Absolute neutrofil granulocyte is $<0,5\text{ G/l}$, or is predicted to fall below that

- ▶ Chemotherapy is always a risk factor!
(high/medium/low risk treatments)
 - ▶ Mortality rate is much lower thanks to the effective management nowadays
 - ▶ Diagnosis
 - Physical examination (oral cavity, skin, lungs, etc)
 - Laboratory (CBC, electrolytes, renal function, urine)+**blood culture**, stool sample, etc
 - Imaging diagnostics
- 

Febrile neutropenia

High-risk vs low-risk patients

Table 2. Points system of the Multinational Association for Supportive Care in Cancer (MASCC)

Criteria for protection	Points
1. Disease intensity: absent or mild ¹	5
2. No hypotension (systolic blood pressure \geq 90mmHg)	5
3. No chronic obstructive pulmonary disease ²	4
4. Hematologic neoplasia or no previous fungal infection	4
5. No dehydration ³	3
6. Disease intensity: moderate symptoms ¹	3
7. Fever as outpatient	3
8. Age < 60 years	2

Total points: 26 points. Low risk \geq 21 points; High risk < 21 points

1. Intensity of disease: subjective assessment of patient's general condition: can not add item 1 to item 6 - if the clinical condition is serious this criterion can not be scored
2. SBP: Systolic Blood Pressure
3. Chronic obstructive pulmonary disease - characterized by acute bronchial asthma or emphysema or need for oxygen therapy or steroids and/or bronchodilators
4. Dehydration - the need for intravenous hydration

BELLESO, Marcelo et al . Screening for the outpatient treatment of febrile neutropenia. *Rev. Bras. Hematol. Hemoter.*, São Paulo , v. 32, n. 5, p. 402-408, 2010 . Available from <http://www.scielo.br/scielo.php?script=sci_arttext&pid=S1516-84842010000500014&lng=en&nrm=iso>. access on 10 Dec. 2018. <http://dx.doi.org/10.1590/S1516-84842010000500014>.

Febrile neutropenia Treatment

▶ Antibiotics

- Always wide-spectrum antibiotics!
- Low-risk patients could be treated ambulatory with per os drugs (moxifloxacin, or ciprofloxacin+amoxicillin/clav.)
- Monotherapy is not inferior to combined treatment(carbapenem, ceftazidim, cefepim)!
- Add vancomycin if: MRSA infection, catheter-related infection, Clostridium diff., sepsis)

Febrile neutropenia

Treatment

- ▶ Antifungal drugs
 - Confirmed fungal infection, or persistent fever and other symptoms after 7-10 days
 - Fluconazol/votriconazol/itraconazol, amphotericin B
- ▶ Duration: (daily labororatory ex., fever taken every 4 hours)
 - Low-risk: No fever for 48 hours, ANC >0,5 G/l, treatment can be discontinued
 - High-risk: No-fever for 48 hours, asymptomatic, ANC>0,5 G/l, + **negative blood culture**

Febrile neutropenia Treatment

- ▶ Colony stimulating factor
 - Not routinely administered
 - Decreases the mortality, the duration of neutropenia, and hospitalization
 - With no prior G-CSF treatment, and high-risk patient (prior neutropenia, >65 years, sepsis, ANC <0,1 G/l, persistent symptoms/neutropenia) is always recommended

Superior vena cava sy

- ▶ Extravascular compression and/or intravascular thrombosis of the SVC, which leads to obstruction
- ▶ Malignancy in the 70-80% of all cases!
- ▶ Usually seen with
 - Lung cancer
 - Non-Hodgkin lymphoma, thymoma
 - Mediastinal tumors

Superiors vena cava sy



Superior vena cava sy

- ▶ Early signs and symptoms: dyspnea, chest pain, dry cough, stridor, **plethora, edema and dilatated veins of the face, periorbital region, throrax and upper limbs**
- ▶ Later: visual deficits, letargy, somnolency, cyanosis, tachycardy, tachypnea, in severe cases respiratory failure, stupor, seizures, coma
- ▶ Diagnosis: chest X-ray, CT/ MRI

Superior vena cava syndrome Treatment

General

Bedrest, oxygen therapy

NO iv. Fluids in the upper limbs!

Corticosteroids

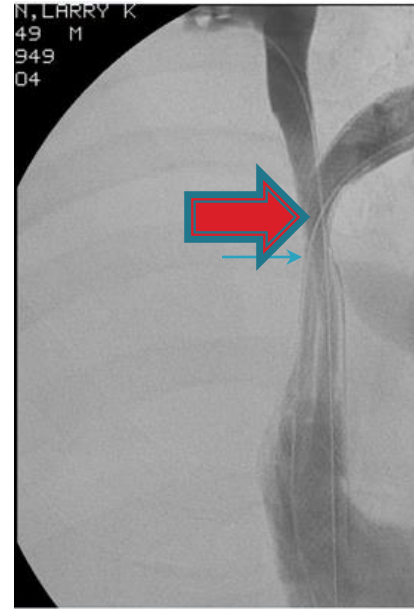
Diuretics

Trombolysis, anticoagulation therapy


Specific therapy

Urgent radiotherapy, and/or ChT in chemosensitive tumors

Stent implantation, bypass operation



Cardiac tamponade

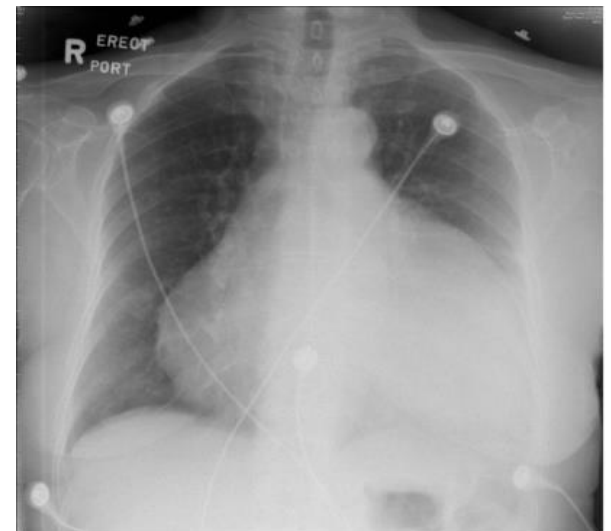
- ▶ *Accumulation of pericardial fluid, which result in decreased ventricular filling and subsequent hemodynamic compromise*
 - ▶ Causes: pericarditis, rupture, uremia, malignancy, iatrogenic procedures (chemo/radiotherapy, surgery)
 - ▶ Usually seen with lung cancer, breast cancer melanoma, lymphoma, leukaemia
- 

Cardiac tamponade

- ▶ Signs and symptoms: hypotension, dilated jugular veins, murmured heart sounds (Beck-triade), pulsus paradoxus, pericardial friction rubs, tachycardia, tachypnea, dizziness, somnolency
- ▶ ECG: low voltage, in case of pericarditis ST-elevation
- ▶ Diagnosis: Chest X-ray chest CT, echocardiography!

Cardiac tamponade

- ▶ Treatment:
 - Pericardiocentesis
 - Pericardiotomy
 - Iv. dobutamin
 - In case of hemodynamically compromised patient heart surgery might be needed



Hypercalcaemia

- ▶ 10-20% of all cancer patients!
- ▶ Usually seen with: breast cancer, lung cancer, lymphoma, multiple myeloma
- ▶ Etiology
 - Increased PTHrP production (paraneoplastic sy)
 - Bone metastases → osteolysis
 - Increased calcitriol production of the tumor

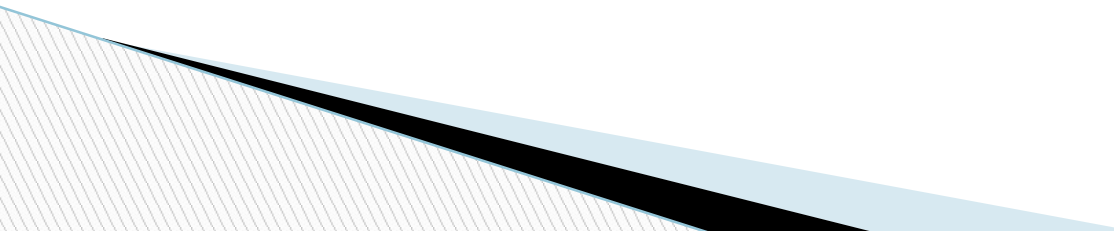
Hypercalcaemia

- ▶ **Signs and symptoms:** Weakness, nausea, vomiting, constipation polyuria, polydipsia, altered mental status, in severe cases acute renal failure, arrhythmia, sudden death
 - Chronic: kidney stone, bone pain, psychosis
- ▶ ECG: bradycardic, short QT, prolonged PR interval
- ▶ Laboratory: Elevated total and ionized Ca, with normal PTH levels

Hypercalcaemia, treatment

- ▶ Primary cause elimination if possible!
- ▶ Lower the Ca level, prevent complications
- ▶ Extensive hydration+diuresis
- ▶ Calcitonin
 - Fast effect but not potents
 - Increases renal excretion, blocks osteoclasts maturation
- ▶ Bisfosfonate
 - Cytotoxic effect on osteoclast, stops Ca release from bones
- ▶ (Gallium-nitrát, plicamycin)

Tumor lysis syndrome

- ▶ Metabolic abnormalities that may be seen after initiation of cancer treatments
 - ▶ Usually occurs during treatment of hematologic malignancies after 72 hours (1 week)
 - ▶ Increased cell-turnover causes intracellular contents (phosphate, kalium, uric acid) released into the circulation
- 

Tumorlysis syndrome

- ▶ Aspecific signs and symptoms
- ▶ Letargy, weakness, nausea, vomiting, diarrhea, syncope, fever, anorexia, lactate acidosis
- ▶ **Hyperkalaemia: arrhythmia, paralysis**
- ▶ **Hyperphosphatemia, subsequent hypocalcaemia: acute renal failure, tetany, Chvostek, Trousseau symptoms, myopathy, etc.**

Tumor lysis syndrome

- ▶ **Diagnosis:** Cairo-Bishop criteria

 - Laboratory TLS: at least 2 of the following**

 - Uric acid > 8 mg/dL or 25% increase
 - Kalium > 6 mmol/L or 25% increase
 - Phosphate > 4.5 mg/dL or 25% increase
 - Calcium < 7 mg/dL or 25% decrease

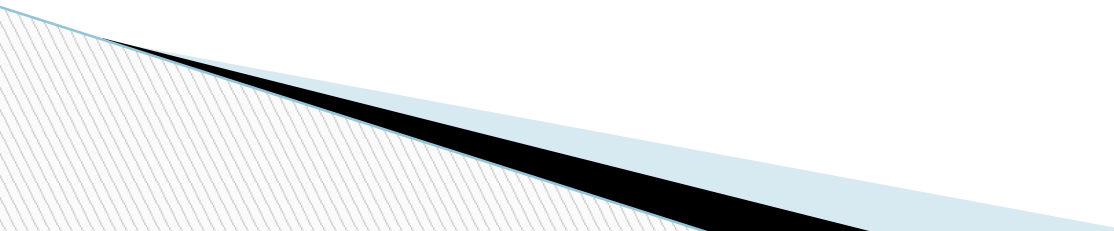
- ▶ **Clinical TLS: + one of the following**

 - Elevated creatinine level (>1,5 ULN)
 - Seizures
 - Arrhythmia, or cardiac arrest

Tumor lysis syndrome

- ▶ *Prevention is more effective than treatment!*
 - Prior to therapy of hematologic malignancy: extensive hydration (>2,5 liter)+diuresis
 - Allopurinol (xantin-oxidase inhibitor)
 - Raburicase (rekombinant urate-oxidase, increases the catabolism of uric acid) is much more potent and faster (and more expensive)
- ▶ IF hyperuricaemia is seen, raburicase is the primary option
- ▶ Alkalisig the urine is NOT recommended nowadays (danger of metabolic alkalosis)
- ▶ Normalize the electrolyte disturbances
- ▶ Acute renal failure: haemodialysis

Spinal cord compression

- ▶ Approx. 10% of all cancer patients!
 - ▶ Usually seen with the metastases of prostate, breast and lung cancer
 - ▶ Urgent intervention is critical!
 - ▶ The more sooner the diagnosis, the better the prognosis is
 - ▶ Failing to treat in time can lead to permanent neurological deficits
- 

- ▶ Most commonly affected region is the thoracic spine



Spinal cord compression

Signs and symptoms

- ▶ **Newly onset back pain!**
 - At start the pain is local, later it can be extensive
 - Usually intensifies with time
 - Usually it's worse laying down
 - Can appear weeks before the other signs
- ▶ Muscle weakness (~80%)
- ▶ Later:neurological deficits
 - Problems with urinating and defecating
 - Paraparesis,paraplegy
 - Sensory dysfunctions

Spinal cord compression

- ▶ Diagnosis: the gold standard method is the non-contrast MRI
- ▶ If not possible
CT-myelography is recommended
- ▶ Signs and symptoms!



Spinal cord compression Treatment

- ▶ Treatment of the primary cause, prevention!
 - Treatment of bone metastases (bisphosphonates, denosumab)
- ▶ General
 - Pain relieving (opiates, NSAID)
 - Neurological symptoms: corticosteroids!
 - Trombosisprofilaxis
 - Laxatives if constipated

Spinal cord compression treatment

- ▶ Unstable spine, pathological fracture, life-threatening compression: urgent surgery, decompression is crucial
- ▶ Stable spine: (no fracture, bone fragments): Currently surgical intervention AND radiotherapy is the primary choice of treatment