

# Oncologic emergencies, supportive therapy, rehabilitation

Gábor Rubovszky

Department of Oncology, Semmelweis  
University, Budapest – National Institute of  
Oncology

# Oncological emergencies

- Metabolic - hormonal *paraneoplastic syndromes*
- Hematologic
- Mechanical complications
- Side effects of therapy

# Metabolic - hormonal emergencies

- Disturbance of ADH secretion
- Hypercalcaemia
- Adrenocortical insufficiency
- Tumor lysis syndrome
- Hyperglycaemia
- Acute renal failure

# Antidiuretic hormone

- SIADH: normovolemic hyponatraemia
  - Diff. diag.: adrenocortical insuff., diuretics, hypothyroidism, renal insuff., cirrhosis, nephrosis, CHF, hyperglycaemia, hyperlipidaemia, hyperproteinaemia (myeloma multiplex)
  - Aspecific signs: depression, lethargy, irritability, weakness, movement disturbance, coma, seizures

## Causes:

- central nervous system related: infection, bleeding
- cancer: SCLC, GI, lymphoma
- drugs: serotonin reuptake inhibitors, tricyclic antidepressants, carbamazepine.

## Therapy:

fluid restriction

gradual Na substitution (central pontine myelinolysis!)

elimination of cause

demeclocyclin (tetracycline antibiotic), tolvaptan (vasopressin R2-antag.)

# Antidiuretic hormone

Diabetes insipidus (central, renal)

metastasis to pituitary gland (25% of central DI)

renal: amyloidosis, polycystic kidney, drugs (lithium)

Signs: thirst and increased fluid intake

Therapy: desmopressin

# Hypercalcaemia

- Most common paraneoplastic syndrome (appr. 10% of solid tumour cases)
- Lung, breast, head and neck, and renal cancers, haematological malignancies (lymphoma and myeloma multiplex).
- Generally with bone metastases: increased parathyroid- hormone-related protein (PTHrP) production and calcitriol secretion. Paracrine cause – it may occur without bone mets.
- Signs: nausea, vomiting, disorientation, fatigue, anorexia, bone pain, polydipsia/polyuria, and constipation .
- Obvious neurological symptoms when  $\text{Ca} \geq 3.5 \text{ mmol/l}$ . Insomnia, disorientation, lethargy, coma, death.
- Treatment:
  - intravenous fluids and bisphosphonate

# ADRENAL INSUFFICIENCY

- Causes:
  - autoimmun
  - primary adrenal gland tumour or adrenal gland metastasis
  - immun-therapy
  - long-term glucocorticoid therapy
  - pituitary adenoma

## Signs:

Lab: marked hyponatremia, hypoglycaemia, hyperkalaemia, or eosinophilia.

Cardiovascular collapse, muscle aches, nausea, vomiting, and diarrhea.

If the patient reached crisis, the outcome is uncertain, even with medical intervention.

- Treatment: I.V. steroid, glucocorticoid, and mineralocorticoid.

# TUMOUR LYSIS SYNDROME

- Cause: tumour cells die and dissolve (lysis)  
Typical: haematological diseases (lymphomas, leukaemias), rarely in solid tumors (large tumour burden, strong and very fast tumour response – testicular cancer) 1-5 days after ChT
- Signs:
  - hyperuricemia, hyperkalaemia, hyperphosphatemia, hypocalcaemia, anaemia, acidosis.
  - Renal function. (danger of acute kidney injury).
  - Neurological symptoms: sleepiness, loss of concentration.
  - Fever, haemorrhagic diathesis.
- Treatment:
  - intravenous fluid therapy
  - normalisation of the laboratory values
  - allopurinol, rasburicase (recombinant urate-oxidase)
  - normalisation of the acid-alkaline balance



# Haematological

1. Hyperviscosity syndrome: myeloma multiplex, Waldenström-macroglobulinaemia
2. Disseminated intravascular coagulation (DIC)
3. Febrile neutropenia

# Haematological



1. Hyperviscosity syndrome: myeloma multiplex, Waldenström-macroglobulinaemia
  1. Treating the cause
  2. Plasmapheresis

# Haematological

## 2. Disseminated intravascular coagulation (DIC)

Consumption coagulopathy

Cause: cancer, obstetric, trauma/burns, sepsis

- small blood clot formation  chest pain, dyspnoea, leg pain, aphasia, paresis
- clotting factors and platelet used  bleeding
- May be: acute or chronic
- Lab: low platelets, low fibrinogen, high INR, high D-dimer
- TF is released in response to exposure to cytokines (particularly interleukin 1), tumor necrosis factor, and endotoxin
- Treat the underlying disease + substitution
- Mortality: 20-50%
- Diff.dg.: TTP (ADAMTS13)

# Haematological

## 3. Febrile neutropenia:

neutropenia (generally neutrophyl  $\leq 0,5$  G/l) + fever ( $\geq 38C$ )

Severe infection (or danger of it), sepsis.

### MASCC score

CHARACTERISTIC	WEIGHT
Burden of febrile neutropenia with no or mild Symptoms <sup>1</sup>	5
No hypotension (systolic BP > 90 mm Hg)	5
No chronic obstructive pulmonary disease <sup>2</sup>	4
Solid tumor or hematological malignancy with no previous fungal infection <sup>3</sup>	4
No dehydration requiring parenteral fluids	3
Burden of febrile neutropenia with moderate Symptoms <sup>4</sup>	3
Outpatient status	3
Age <60 years	2

### CISNE score

Characteristic	Points
Eastern Cooperative Oncology Group Performance Score $\geq 2$	2
Stress-induced hyperglycemia (Initial blood glucose $\geq 121$ mg/dL (or $\geq 250$ mg/dL in diabetics or if on steroids)	2
COPD	1
Chronic cardiovascular disease	1
Mucositis grade $\geq 2$	1
Monocytes < 200 cells/microliter	1
<b>Scoring:</b>	<b>Interpretation:</b>
Low risk = 0	1.1-1.5 % risk of complication within 7 days
Intermediate risk = 1-2	4-6.2% risk of complication within 7 days
High risk = $\geq 3$	34-95% risk of complication within 7 days

# Haematological

Treatment of febrile neutropenia:

GCSF (also primary and secondary prevention)

broad-spectrum antibiotic

anti-fungal drugs

ICU, if needed

# Mechanical complications

1. SUPERIOR VENA CAVA (SVC) SYNDROME
2. EPIDURAL SPINAL CORD COMPRESSION
3. MALIGNANT PERICARDIAL EFFUSION – CARDIAC TAMPONADE
4. MALIGNANT PLEURAL EFFUSION
5. RESPIRATORY TRACT OBSTRUCTION, MASSIVE HAEMOPTYSIS
6. URINARY TRACT OBSTRUCTION
7. GYNAECOLOGICAL AND URINARY TRACT BLEEDING
8. PATHOLOGICAL FRACTURES



Source: Nat Clin Pract Cardio



# Mechanical complications

## 1. SUPERIOR VENA CAVA (SVC) SYNDROME

Compression vs. thrombosis (tumor or clot)

Blocks the drainage of the head, shoulders, and upper extremities

Signs:

-increased neck circumference, facial swelling, bloodshot conjunctiva, dilated thoracic and jugular veins, swelling of the upper arms

-dyspnoea, cough,, headache caused by cerebral oedema; occasionally, hoarse voice



# SUPERIOR VENA CAVA (SVC) SYNDROME

Diagnosis: thoracic CT

Therapy:

- stent grafting at a vascular centre
- secondary option is emergency radiotherapy
- steroid, diuretics
- pharmacotherapy of tumor

05-Mar-2008 13:27

SC:SAG T2 FSE  
Series: 103

GENESIS\_SIGNA GEMSOV  
HFS  
512 x 512 x 16  
MRI T-SPINE W/O CONTR

A

P

20  
Echo: 1  
TR: 4450.00  
TE: 105.8  
Slice: 3.00 Loc: 12.74

200 mm

MR-USCTLMID  
T1: 90.00  
W: 1212 L: 607  
Filter: None Fact: 0  
Diameter: 360.00  
Acquisition: 16-4950000.00  
Acquired Matrix: 448 0 0 224  
#Excitation: 4.00

# Mechanical complications

## 2. EPIDURAL SPINAL CORD COMPRESSION

Threatening striated lesions 5-14% of all metastatic patients.

Cause:

- 70% met at the dorsal spine
- lymphoma, myeloma, or primary spinal cord glioma

Signs: neurologic deficit (sphincter dysfunction, paresis, plegia) in hours or days.

**TIME FACTOR !**

# Spinal cord compression

Diagnosis: immediate (!) MRI

Many times it becomes irreversible in a short time (hours).

Team decision:

- decompression surgery
- radiotherapy
- steroid
- stabilisation

Poor outcome: two thirds of ESCC patients die within one year.

# Mechanical complications

## 3. MALIGNANT PERICARDIAL EFFUSION – CARDIAC TAMPONADE

Mostly lung and breast cancer metastases to pericardium.

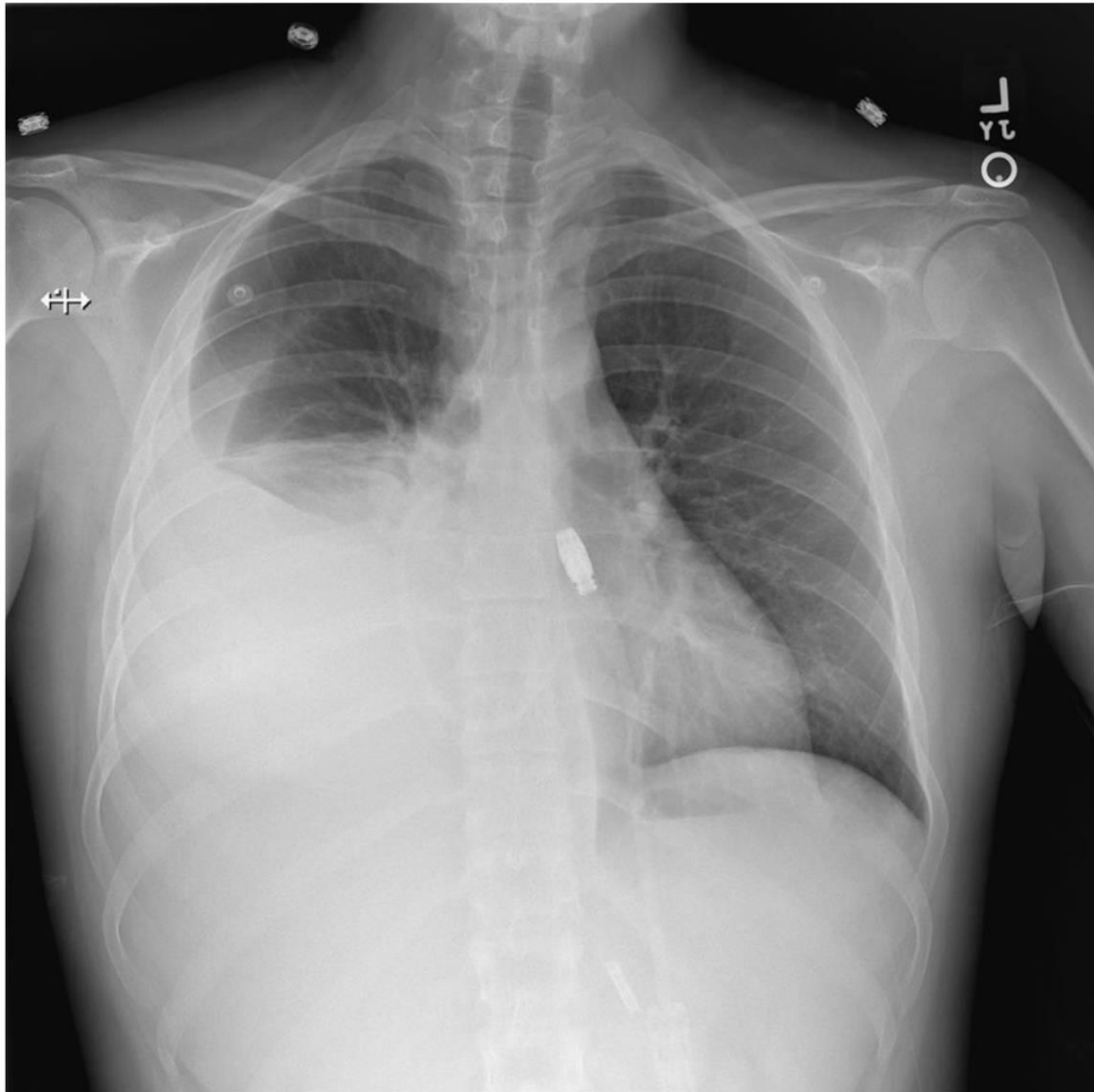
Other causes: infection, inflammation, renal insuff.

Signs: like heart failure - dyspnoea, feeling of palpitation, dizziness, and fatigue (pulsus paradoxus)

Diagnosis: echo

Treatment: pericardiocentesis, cardiac surgery (pericardiac window)

Drugs: NSAID, steroid, colchicin



Source: Allaham H, Hudhud D, Salzer W. Right-sided hydrothorax: a peritoneal dialysis dilemma. BMJ Case Rep. 2018.

# Mechanical complications

## 4. MALIGNANT PLEURAL EFFUSION

Mostly lung and breast cancer metastases to pericardium.

Other causes!

Signs: dyspnoea, pain, tachypnoea.

Diagnosis: physical exam, X-ray, CT, US.

Treatment: pleurocentesis, pleurodesis

# Mechanical complications

## RESPIRATORY TRACT OBSTRUCTION, MASSIVE HAEMOPTYSIS

Causes: Intrabronchial tumor  
Bleeding

Signs: dyspnoe, tachopnoe, ortopnoe, haemoptoe. Spastic breathing (whistling, whining sound).

Diagnosis: CT, bronchoscopy.

Therapy: tracheotomy  
bronchoscopic laser therapy or stenting  
radiotherapy (EBRT or intraluminal brachytherapy)  
steroid treatment



# Mechanical complications

## URINARY TRACT OBSTRUCTION

Tumor spread in pelvis, radiofibrosis.

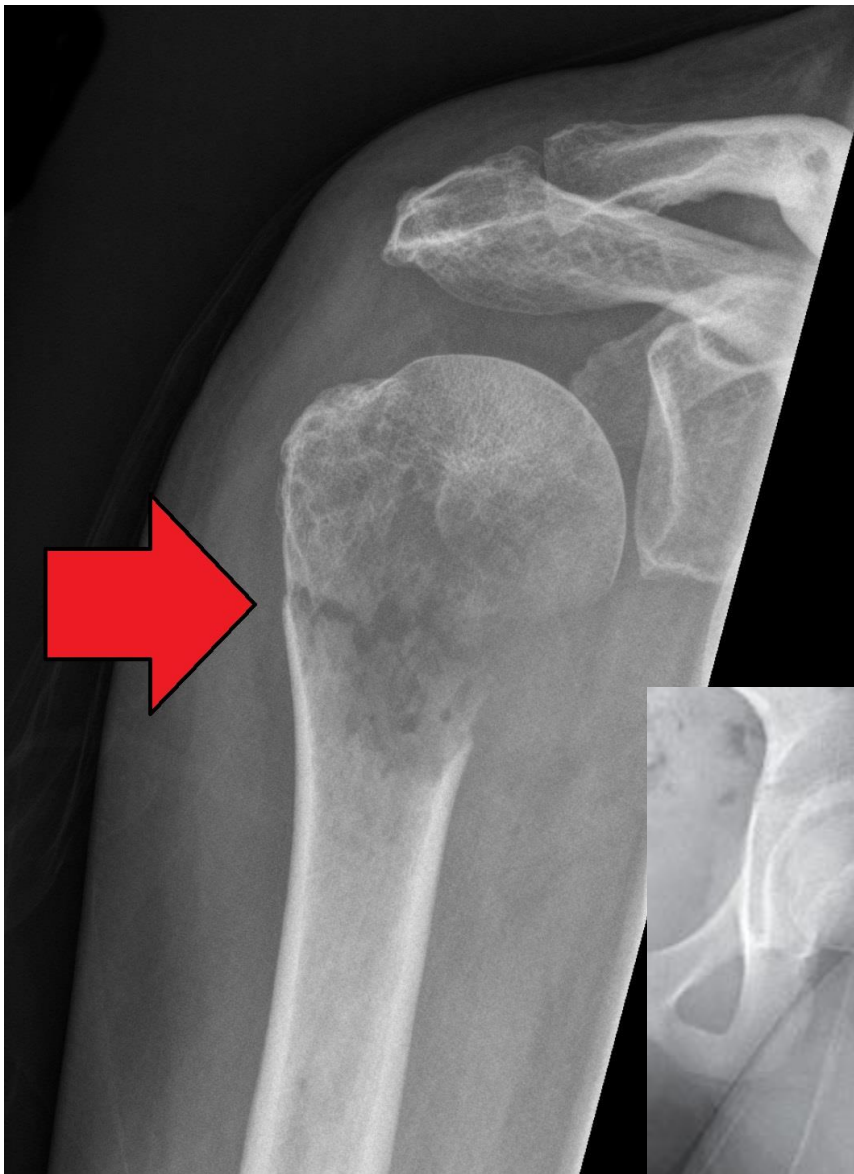
Signs: pain, anuria, renal insuff., fever.

Urethral stent, percutaneous nephrostomy.

## GYNAECOLOGICAL AND URINARY TRACT BLEEDING

Pelvic tumors (gynecological, rectal, bladder, etc.)

Treatment: tamponation, per os or I.V. antihemorrhagic drugs, radiotherapy (EBRT, brachytherapy), angiography embolisation, hypogastric artery ligation.



# Mechanical complications

## PATHOLOGICAL FRACTURES

Bone fracture caused by weakness of the bone structure that leads to decrease mechanical resistance to normal mechanical loads. Fractures with minimal collision, push or impact.

Osteoporosis, bone mets.

First to do after diagnosis (X-ray): stabilisation.

Hystology! Search for primary tumor.

Radiotherapy.

Medical treatment accord to hytology, biomarkers (molecular pathology).

# EMERGENCY SITUATIONS SUBSEQUENT TO ONCOLOGICAL TREATMENT

1. Allergic reactions
2. Uncontrollable diarrhoea (enteritis, colitis)
3. Severe vomiting
4. Stomatitis
5. Autoimmun complications (acute pulmonary fibrosis, hepatitis, carditis, etc.)

# Radiotherapy for palliation

Pain management (bone mets, pelvic tumor, etc.)

Intracranial mets (MR, surgery, Rx – stereotactic, GammKnife, drugs)

Vertebral mets, bone mets

Mechanical (venous, bronchial) obstruction

Bleeding

Sensitive organs!

# Supportive therapy

- Tumorous cachexia, sarcopenia
  - fatigue, weakness
  - stamina, resistant capacity (infections, oncological therapy)
  - survival

Nutrition.

Appetite enhancers (progestagens)

Physical activity.

- Antiemetics (steroid, serotonin or neurokinin 1 receptor antagonists)
- Haematological: erythropoiesis-stimulating agents (ESA), GCSF.
- Pain management.
- Psychological.

# Rehabilitation

To lead back to normal life. QOL.

Loss of the affected organ or its function.

Psychological damage.

Def.: It is well-organised and planned, and requires the purposeful cooperation of multidisciplinary teams of experts, the patient, and the patient's family (supporters), throughout the complex and coordinated process.

Purpose: alleviate - and if possible, prevent - the psychological, physical, and lifestyle damages caused by the disease and its treatment.

# Rehabilitation

Begins with the diagnosis.

1. Musculoskeletal rehabilitation
2. Lymphoedema
3. Otorhinolaryngology patients
4. Stoma
5. Sexual dysfunction



# Musculoskeletal rehabilitation

Breast surgery.

Extremity amputation (prosthetics).

Physiotherapy.

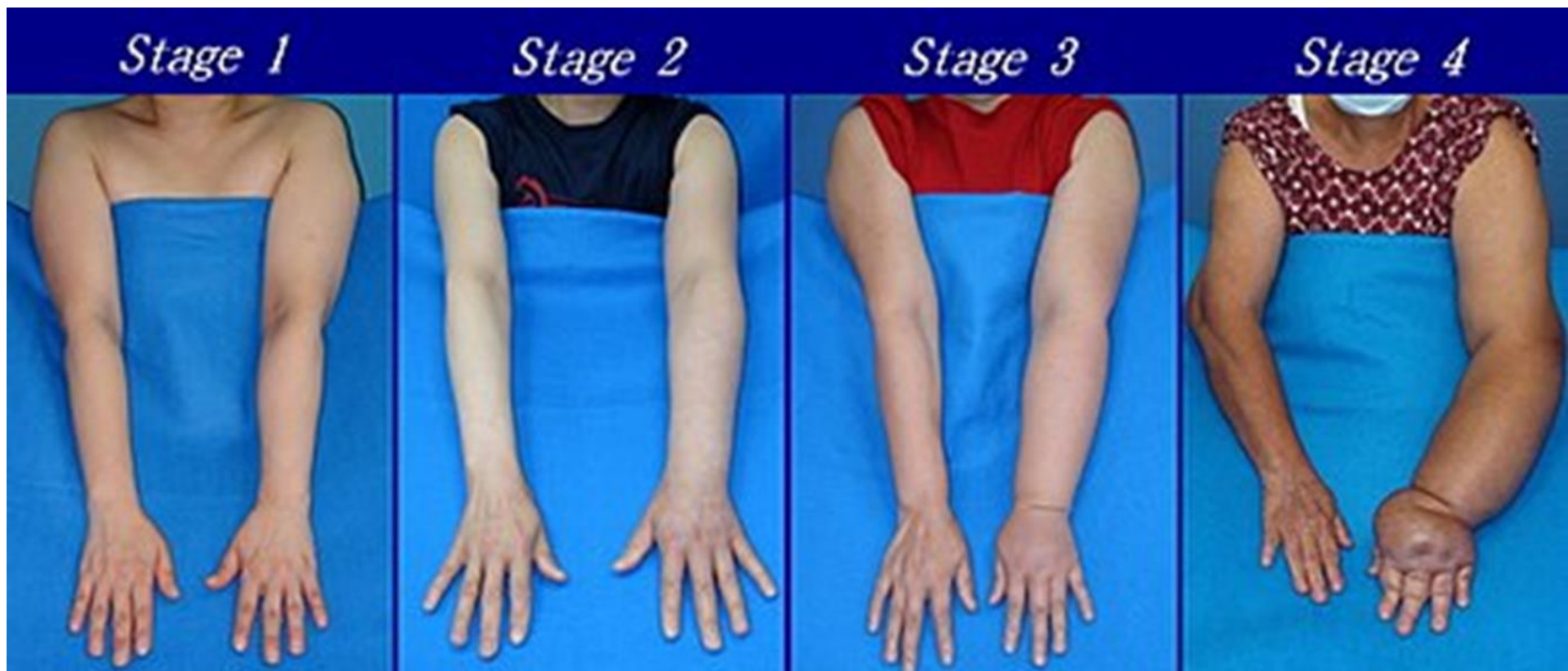
# Lymphoedema

Surgery, radiotherapy, tumor spread.

Diagnosis.

Prevention! Intervention in time!

Physiotherapy (special massage, bandage, pneumatic compression, compression garments – sleeves, stockings)



# Otorhinolaryngology patients

- Swallowing rehabilitation
  - coordinated work of speech therapists, dietitians, physiotherapists, psychologists.
- Vocalisation after laryngectomy
  - tracheostoma
  - mastering oesophageal speech
  - mechanical vocalisation
  - voice prostheses



# Patient with stoma

- Tracheostoma
  - secretions collecting in the tracheostoma must be drained regularly.
  - patients should perform themselves
  - humidification
- Nephrostoma
  - renal pelvis catheter
  - urine collecting leg bag
  - absorbent, antiperspirant
- Colostoma (jejunostoma)
  - intermittent – permanent
  - train patients – rules of hygiene – skin care
  - dietary restrictions, self observations

# Onco-psychological rehabilitaion

Psychological burden derived from  
disease, treatment and their consequences  
self-esteem, social network – family – friends  
work, financial  
wishes, expectations, realities

Mentally decompensation, experience an emotional crisis.

Distress is a multifactorial and unpleasant emotional experience that often inhibits effective mental coping mechanisms.

Methods:

- crisis intervention,
- consultation,
- patient education (e.g.: psychological preparation for surgery or radiotherapy),
- individual supportive psychotherapy,
- group therapy (e.g.: Simonton training, autogenic training).

# Sexual rehabilitaion

Ladies:

- loss of body parts (breast, gynecological tumors)
  - negative body imag
  - decreased self-esteem
- development of side effects due to the surgery, chemotherapy, or radiotherapy
  - nausea, weight loss, hair loss, hypersensitivity of the mucosa also negatively affect the libido.
- discuss body image issues and fertility preservation technics before surgery
- adequate onco-psychological services

# Sexual rehabilitaion

Men:

- most common issues in men are erectile dysfunctions (after radical prostate surgery, radiotherapy, hormone therapy – also loss of sexual desire).
  - Erection may be improved with drug treatment, complemented by psychological support.
- Infertility: caused either by the disease or its treatment.
  - services of sperm banks may be recommended before treatment.