

**Ministry of health Ukraine  
Higher state educational establishment of Ukraine  
«Ukrainian medical stomatological academy»**

**DEPARTMENT OF ONCOLOGY**



It is ratified on the methodical conference  
Protocol №1 from August, 30 of  
2018p. Manager of chair of oncology  
MD, prof. Bashtan V.P.

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**METHODICAL POINTING  
FOR INDEPENDENT WORK OF STUDENTS  
DURING PREPARATION TO PRACTICAL EMPLOYMENT**

<i>Educational discipline</i>	<i>Palliative help</i>
<i>Module №</i>	<i>I</i>
<i>Rich in content module №</i>	<i>I</i>
<i>Theme of employment</i>	<b>Emergency help by an oncologic patient</b>
<i>Course</i>	<i>VI</i>
<i>Faculty</i>	<i>Medical</i>

**Prepared methodical development:**  
MD, professor Chernobay A.V.  
MD, professor Sheleshko P.V.

**Poltava – 2018**

***Theme:***

***EMERGENCY THERAPY IN ONCOLOGY***

***Amount of hours : 6 educational hours***

**Material and methodical providing of theme:** Educational room, to wards radiological, chemotherapy and thoracal departments of oncologic dispensary. Methodical developments for students, tests, tasks, tables.

**1. ACTUALITY OF THEME**

Urgent intensive therapy is a complex of measures (intensive treatment, supervision and care, is after a patient), directed on warning or removal of violations of functions vitally important organs and systems at diseases and states which present a threat for life, — most full realized in the proper specialized departments. Especially often in intensive therapy oncologic patients need during development in them of critical conditions. Malignant tumor without regard to that which is a mainly local process, already on the early stages of development causes general disorders in an organism. In basis of development of endotoxiosis and influence of tumor on an organism absorption of nutritives lies, from one side, malignant fabric and methobolits, and from other side are violations of exchange of, which arise up under act of active matters which are selected by tumor fabric. Regardless of localization of tumor such symptoms appear for patients, as a general weakness, enhanceable fatigueability, nausea, vomit, absence of appetite, up to a complete anorexia, dystrophy of muscular fabric and making progress degrowth body, pallor and yellowness of skin covers, pains, in muscles and cysts and other An amount rises in blood of leucocytes, appear anaemia, hypoproteinemia, potassiumuria, azotomia, change in the system of hemopexis. For patients with malignant new formations a catastatic reaction and immunodepression is characteristic. In that time as a result of development of tumor process in a clinical picture local changes can prevail in organs. For example, at the tumors of mediastinum, large tumors which are localized in

an abdominal region and retroperitoneal space, there is a compression of lungs, organs of abdominal region, but other The shortness of breath appears for patients, there are violations of interchange of gases and circulation of blood, respirator acidoses, a hypoxia makes progress, the signs of violation of venous outflow increase from an abdominal region, hydroperitoneum, albuminous and water-electrolyte disorders, intoxication.

### **Educational aims:**

- **To know:**

- (a-II)

1. Etiology of the exigent states which arise up at the widespread forms of malignant new formations
2. Clinical displays of the states which need urgent therapy
3. Obligatory methods inspections sick with such pathology
4. Basic methods treatments sick, which need urgent therapy
5. To know risk groups

- **Able:**

- (a-III)

1. To conduct the general objective and special inspection of patients with the different variants of the complicated flow of cancer illness
2. To define the value of additional methods of inspection for patients with the different variants of the complicated flow of cancer illness
3. To appoint individual treatment of patients with the different variants of the complicated flow of cancer illness
4. To appoint prophylactic measures on a fight against the different variants of the complicated motion of tumors.

## II. INTERDISCIPLINARY INTEGRATION.

Discipline	To know	Able
Anatomy	Structure of stomach, blood supply, lymph flow	
Stalemate. anatomy	Morphological changes at precancerosis diseases and consisting of mucus layer of stomach, histological variants of malignant process	To estimate the results of cytological and histological researches
General surgery and therapy	Methods of physical, laboratory and instrumental inspections of stomach. Volume and principles of surgical treatment of diseases of stomach.	To conduct physical and clinical inspection of patients with the cancer of stomach. Able to read sciagrams at x-ray photography inspection of stomach

## 3. MATERIALS OF BEFORE AUDITORY.

**3.1.**Base knowledges, abilities, skills, necessary for a study themes (interdisciplinary integration)

Discipline	To know	Able
Radial diagnostics	Roentgenologic signs of primary tumors and metastases impressions of bones	To read sciagrams and computer sciagrams
General surgery and therapy	Methods of physical, laboratory and instrumental inspections of the staggered organs and regions.	To conduct physical and clinical inspection of patients with the tumor impressions of different organs.
Neurology	Topical of different levels of the impression of the nervous system	To conduct the primary review of patient with the exigent oncologic state and appoint the initial volume of the first aid.
Anesthesiology and reanimation	Pharmakokinetics of analgetics, anti inflammatory, respiratory and cardiac	Able to appoint urgent therapy at the exigent states

### **3.2. Table of contents of theme.**

General and local influence of tumor process on an organism, changes, caused radical therapy and chemotherapy both at primary and at repeated, influence, volume, character and duration of operative interference, anaesthesia, features of flow of postoperative period are all of these factors, which meet in different connection, determine somatic status of oncologic patients, create the danger of development of critical conditions on any stage of the combined and complex treatment.

Disorders of physiology functions and violations of activity of the separate systems which can not be spontaneously corrected by self-regulation stipulate development of critical condition of patient. The clinical displays of critical condition are determined development of partial (total) organ or polyorgans insufficiency, for the removal of which it is needed not only correction but also substituting therapy. Pathology, related to the local impression of that or other organ, can depart on the second plan, and on the first the syndromes of critical condition (hypovolemia, violation of hemorheology, sharp respiratory and cardiovascular insufficiency and other), removal of which, come forward then, and more correctly is warning — primary concern of intensive therapy. Presently there are the real possibilities of warning and treatment of critical conditions for oncologic patients, that will allow to promote efficiency of the combined and complex treatment on the whole and each of his components.

An emergency situation can arise up and as the first display of malignant tumor.

#### **Compression of spinal cord**

A compression of spinal cord is heavy and frequent complication of oncologic disease. An early diagnosis and rapid beginning of treatment is the decision factors of prevention of damage the function of spinal cord which is characterized paresises/paralyses as violation of activity of organs of small pelvis.

## **Etiopathogenesis**

For the oncologic patients of prelum of spinal cord it can be contingently metastases in epidural space, which damages an action, intramarrow metastases, change of vertebrae and haematoma, bone fragments in subdural space of spinal cord.

Metastases in epidural space of spinal cord are the most frequent reason of his compression for oncologic patients. The impression of epidural space takes a place in various ways. A typical variant is a metastasis in a neurocentrum with the next invasion of front epidural space. Most often it is at to the metastatic cancer of breast, lung, prostatic, kidney, tumors of gastroenteric highway. Juxtaspinal tumors can get to the spinal channel by direct distribution through the intracostal openings. This way is typical for lymphosarcomas. Gematogenni metastases in epidural space or matter of spinal cord are observed rarely.

On principle the compression of spinal cord can be observed at any level, however more frequent is at the level of pectoral part (70%), rarer - lumbar (20%) and neck (10%).

The clinic of compression of spinal cord is characterized tetrad of clinical symptoms: **by pains, weakness, disfunction of the vegetative nervous system (by a parafunction pelvic organs), violation of sensitiveness.**

Presence each of these symptoms can testify to the compression of spinal cord.

Pain local or for it is been the type of redicular syndrome the first symptom in 95% patients with a tumor process in epidural space.

A pain syndrome passes ahead appearance of other symptoms on a few weeks or months. Localization of pain usually answers level tumor. Such accordance is not observed sometimes, and pain can be marked both higher, and below areas of compression of spinal cord.

A sickly syndrome is conditioned a stretch or compression of periosteal receptors or compression of vertebra, and also by the stretch of nerves. Pains can in-

crease at a cough, stretch and in position on the back, but can be such that irradiation, that hampers diagnostics substantially.

As making progress muscular weakness is observed in 76% patients with the compression of spinal cord and more frequent appears complaints about weight and «phizomelic» of lower extremities, their «dragging», at walking.

Disfunction of the vegetative nervous system is marked in 57% patients as sharp or gradually increasing parafunctions organs of small tазa. This symptom is one of the most heavy displays of compression of spinal cord and is an unfavorable factor.

Violations of sensitiveness (paresthesia, anaesthesia, hypercraesthesia) mark 51 % patients.

The careful questioning of patients and attentive inspection allow to set time of beginning of compression of spinal cord and its level [2].

At the compressions of spinal cord higher level of ThXII – LI, as a rule, a clinical picture which includes a muscular weakness in lower extremities develops, thermoanaesthesia, parafunction pelvic organs, and sexual disorders. Compression of spinal cord of caudal of Th I, accompanied a lower paraplegia or paraparesis with the maintainance of function of overhead extremities. If a compression takes a place higher S5, tetraplegia develops and tetraparesis.

At the compression of distal part of spinal cord there are symmetric pains in a perianal area with an early thermoanaesthesia in the area of crotch. A compression in an area (cauda equina) (between LI, and SIII), as a rule, appears asymmetric, segmental violations of motive and perceptible character in lower extremities.

Potentially by mortal complication metastatic defeats of neck vertebrae are sublocation in atlantooccipital connection. Metastases in the II neck vertebra conduce to the pathological break of «tooth» of vertebra a partial change, which a compression of neck segments of spinal cord which is accompanied the stop of breathing is as a result of.

Most patients with metastases in overhead neck vertebrae grumble about the sickly feelings in overhead parts necks which increase at the turns of chairman, with a possible irradiation in a shoulder or shoulder-blade. Pain is in the area of neck, spasm near vertebral muscles, limitation of motions in the neck part of spine is permanent violations to the moment of establishment of diagnosis. At distribution of process appear weakness in lower extremities, loss of equilibrium, insolvency of sphincters of rectum and urinary bladder, dizziness, dysarthria, difficulty, at swallowing.

### **Diagnostics of compression of spinal cord**

Neurological and physical inspection : percussion of spine, estimation of motive and sensory weakness, passive bending of neck, getting up of erect leg, rectal inspection (estimation of tonus sphincter), «pin» test, from the fingers of foot to the chairman for establishment of level of sensitiveness.

Sciagraphy research. At sciagraphy in a direct projection the characteristic changes of bodies of vertebrae at the level of compression of spinal cord find out in 91% patients with epidural metastases.

Radioisotope research of marrow.

Computer tomography of spine is with introduction of contrasting matter.

Magnetically-nuclear-resonance tomography with contrasting owns the greatest sensitiveness and specificity for determination of compression of spinal cord and is a standard for his diagnostics .

### **Treatment of compression of spinal cord**

As soon as a diagnosis is clear, it is necessary to begin treatment, because quite often a weakness is expressed during a few hours can pass to the irreversible paraplegia.

#### Exigent measures.

Immobilization of spine, if such was not, by a hard shield, special orthopaedic corsets, collars.



Setting of corticosteroids hormones which diminish the edema of spinal cord (high doses of dexamethason are after the following chart: single introduction of 20 mg dexamethason intravenous with next application of preparation perorally for 8 mg (16 pills) in days the first 10 days, then for 4 mg (8 pills) in days during 2 weeks, then is a supporting dose for 2 mg (4 pills) constantly. It is suggested to utilize the following mode of introduction of dexamethason some authors : to 100 mg preparation intravenously in the first days and in the following is introduction of dexamethason for 4 mg intravenous through each 6 hours

Parallell with Dexamethazonum the diuretic are appointed, preparations to potassium, facilities that improve cerebral circulation of blood, vascular preparations. In the last few years plenty of researches is conducted with the purpose of optimization treatments sick with the syndrome of compression of spinal cord. However much the question of medical tactic remains unsolved, especially in the part regarding to a choice between operative treatment or radial therapy.

- **Radial therapy** is one of the most effective methods of treatment of this complication and allows to obtain a positive medical effect in 30-50% cases.

A testimony is to radial therapy: presence of radiosensitive tumor (cancer of breast, cancer prostatic, plural meielow, neuroblastoma), clinical signs of stability of spine, contra-indication is to operative treatment. Radial therapy can be conducted patients with the plural hearths of compression or slow motion of syndrome of compression of spinal cord.

- **Surgical treatment** keeps the value. A standard operation is consider a decompression laminectomy. Some researchers are offer the operations of resection of bodies of vertebrae from after their prosthetics by synthetic fabrics or strengthening metallic plates.

Testimony to surgical treatment it is possible to formulate by such method: clinical signs of instability of spine, prelum of nervous barrels as a result of direct distribution of tumor, located juxtaspinal, solitary of the focus impression in default of progress of other hearths, unbearable pains which require narcotic analgetics in large

doses, unperceptible to radial therapy tumors, relatively the satisfactory general state of patient and expected life-span more 6 months.

A chemotherapy can be conducted as the first line for tumors, perceptible to the cytostatics.

## **SYNDROME OF PRECAVA**

A syndrome of overhead empty vein (SVPV) is the exigent state, related to violation of circulation of blood in the pool of overhead empty vein. Lately this state meets a bit more frequent in connection with an increase numbers sick by a cancer lung which are principal reason of this state. SVPV is the most used term which it is accepted to mark pathology.

### **Etiopatogenez**

Reason of development of SVPV are three basic pathological processes: compression of vein from outside, germination of wall of vein by a malignant tumor, thrombosis of overhead empty vein.

To the malignant tumors which most are often (80-90%) complicated SVPV, the followings belong: lymphadenomas, more frequent diffuse lymphoblastic with localization in front mediastinum, cancer lung, especially right, metastatics forms of breast cancer, testicle, gastroenteric highway, sarcoma, especially malignant fibrotic histocytoma, melanoma.

Among other reasons which result in SVPV, it should be noted: infectious diseases – tuberculosis, syphilis, thromboses (traumatic, spontaneous or as a result of the second defeat of vessels of mediastinum), paratherapeutic reasons, idiopathic fibrotic mediastinitis, cardiovascular insufficiency, retrosternal goitre.

The clinical picture of SVPV is related to the increase of intravascular venous pressure in areas, a venous outflow from which in a norm is drained through a precava or formative it nameless veins. Deceleration of speed of blood stream, development of venous collateral, symptoms, related to the basic disease, is the components of SVPV. Expressiveness of different signs of SVPV depends on speed of

development of pathological process, level and degree of compression of road clearance of precava and adequacy of collateral circulation of blood.

### **Clinical displays and results of objective inspection**

A clinical flow of SVPV can be sharp or slowly making progress.

The complaints of patient are extremely various: head pain, nausea, dizziness, change of exterior, hoarseness of voice, cough, odynophagia, pains, is in a thorax, breathing, shortness of breath, somnolence is laboured, fainting fit, cramp.

The most characteristic signs of SVPV appear at a physical inspection: expansion, flowdown of veins of neck, pectoral wall and overhead extremities, was swollen person, neck or overhead humeral belt, cyanosis or plethora of person.

### **Diagnostics**

For diagnostics of SVPV it can be enough information of clinic and physical inspection. In default of morphological diagnosis it is necessary leadthrough of all of possible researches for verification of pathological process: cytological research of sputum, bronchoscopy with a biopsy and cytological research of washings off from bronchial tubes, mediastinoscopy, with a biopsy, biopsy of lymphatic nodus, sternal puncture et cetera

Sciagraphy of thorax in a line and lateral projections and tomography is rotined all of patients in the cases of the exigent states or with suspicion on violation of communicating of precava. Roentgenologic research allows to find out a pathological process in mediastinum, degree of his distribution and to define borders for next radial therapy. Computer tomography with contrasting allows to specify the contours of tumor process, degree of the impression of lymphatic nodus of mediastinum.

Dopplerivske ultrasonic research of carotic or supraclavicular veins can help in differential diagnostics between a thrombosis and obstruction from outside.

Not recommended introduction of radiocontrast or other matters to the vein of the staggered extremity through the high risk of extravasate. However in liquid cases conduct a phlebography for the exposure of localization and degree of violation of communi-

cating of precava. A phlebography appears useful to differential diagnostics of vascular and out vessel character of the impression, decision of question, about resectableness, determination of length of the staggered segment.

## **Treatment**

Optimum treatment depends on reasons which caused SVPV, and speed of development of symptoms of progression .

It is possible to begin in the sharp situation of treatment, not having an exact morphological diagnosis. Urgent symptomatic measures are the lives of patient directed on a rescue, they are needed, to provide entering of air lungs, to liquidate impassability of precava and compression of organs of mediastinum. Except for rest, enhanceable position, oxygentherapy, sometimes can may need tracheostomy, intubation, introduction of anticonvulsant facilities. Application of diuretics and corticosteroids is rotined. Introduction of hydrocortisone is recommended from 100 to 500 mg intravenous with the next decline of dose each 6-8 ч taking into account a clinical picture or setting of prednisolon of 60-90 mg intravenous, then for 40-60 mg in days perorally.

**Radial therapy** large factions is by the high-efficiency method of treatment of SVPV, especially at to the cancer lung. Efficiency of it arrives at 70-90% . The irradiation of thorax must begin as possible before. The leadthrough of exigent radial therapy is needed at respiratory insufficiency (including stridor breathing) or at presence of symptoms from the side.

Chemotherapy of treatment as it is better to conduct the first line at presence of fuzz tench, highly sensitive to cytostatics

The combined therapy (chemotherapy and radial therapy) is rotined at to the small cell cancer lung. However related a simultaneous leadthrough of chemotherapy and radial therapy often is to the increase of number of complications (odynophagia, neutropenia) that is why more repressing the stage-by-stage combined therapy (at first treatment, and then irradiation, cytostatics or vice versa).

Treatment anticoagulants or fibrinolytic preparations is routine at the thrombosis of vein. But these preparations must not be appointed standard, after the exception of those cases, when on a phlebography the thrombosis of overhead empty vein is diagnosed or the signs of improvement absent at treatment other methods.

## **HYPERCALCEMIA**

Hypercalcemia for oncologic patients - most frequent threatening life of violation of metabolism, as a rule, circulating character which arises up at widespread malignant tumors.

### **Etiology**

Hypercalcemia with most frequency meets at the followings tumors: cancer of lung, cancer of breast, cancer of ovaries, cancer of kidney, plural mieloma, tumors of head and necks, lymphoblastomas, to new formation with unknown localization of first tumor, a bone, mainly lysis character, has solid tumors with metastases.

### **Mechanism of development of hypercalcemia:**

Two mechanisms of development of this complication are known:

- local metastasis destruction of bones;
- generalisation ossifluence, conditioned the selection of some humoral factors a tumor.

There is strengthening of bone resorption in both cases.

Direct local invasion of bone fabric stimulates freeing of calcium tumor cages, activated osteoclasts, in blood to the level which exceeds excretory possibilities of kidney. Bone resorption is increased cytokines and by other factors which are produced invasion tumor cages. Most often this mechanism of hypercalcemia is observed at a myelomatosis, cancer breast.

Humoral hypercalcemia is observed for patients a cancer lung and kidney in which metastases can absent in cysts. In this case a clinical picture answers hyperparati-

roidism, and a delete or regression of primary tumor under the action of cytostatics therapy results in disappearance of hypercalcemia. Main reason of development of this state is an ossifluence and kidney D-major of calcium is increased as a result of products by tumor fabric of hormonal albumen. It is marked that tumor cages are with expression of hormones, more frequent metastasis in bones, what in other organs and fabrics.

Hypercalcemia result in violation D-major of sodium and water, causing polyuria («calcium diuresis»), the volume of circulatory blood and intertissue liquid goes down accordingly. There is the reserved circle: hypovolemia results in the decline of kidney blood stream, that, in same queue, diminishes the degree of glomerular filtration, and this violation causes the increase of D-major of calcium in the proximal parts of kidney tubulis. Worsen the state of dehydration and frequent vomit.

### **Clinic and diagnostics**

The clinical picture of hypercalcemia contains changes from the side of different organs and systems:

- general symptoms are dehydration, weakness, decline of mass of body, thirst;
- central nervous system are head pain, hypoflexia, proximal miopathy, apathy, breaknes, psychical violations, cramps, to confusional consciousness, comma;
- a gastroenteric highway is an anorexia, nausea, vomit, locks, intestinal impassability, pancreatitis, flatulence, increase of gastric secretion and pepsin-ia;
- the cardio-vascular system is bradycardia, low blood pressure, arrhythmia, asystole, is prolonged;
- urination system is polyuria, azotomia, kidney insufficiency, comma.

If the correction of hypercalcemia is not conducted, dehydrotation (diminishing of volume of liquid), kidney insufficiency, comma and death develops consistent-

ly. In the case of adequate treatment of this complication and next prophylaxis of relapses patients can live during many months and even years.

A presence or absence of clinical symptoms and degree of their expressiveness little depend on the degree of hypercalcemia. Possible and asymptomatic flow of complication. Mainly clinical symptoms appear at the level of calcium in the whey of blood higher 2,9-3,0 mmol/l. It is accepted heavy to count hypercalcemia 3,7 mmol/l or higher. It requires exigent treatment. When the level of calcium becomes even 3,7-4,5 mmol/l or higher, a comma and stop of heart develops.

It should be noted that hypercalcemia is often diagnosed too late or not set in general, because doctors is inclined to interpret a lot of symptoms (weakness, dormancy, dyspeptics disorders, anorexia) as displays of progress of oncologic disease.

### **Treatment**

Every case of hypercalcemia requires exigent measures. Patients from hypercalcemia require the permanent monitoring of indexes: hemodynamics, diuresis, water and electrolyte balance, central venous pressure, creatinine, urea of blood. Active therapy includes proceeding in the volume of circulatory blood and pharmacological correction of hypercalcemia by the increase of secretion of calcium and blocking of bone resorption.

Many authors are offer the following chart of treatment:

- rehydrotation – introduction of isotonic solutions (3-6 l of 0,9% soluble-sodium chloride in days or 300-400 ml at o'clock each 3-4 h). The desired support of central of venous pressure is at the level of 10 sm of water colum;
- diuretic preparations on a background conducted rehydrotation at satisfactory haemodynamic indexes with support of diuresis of 150-200ml/h. Advantage gives oneself up «glomerular diuretics» - furosimid for 20-40 mg intravenously each 2-4h;
- corticosteroid is prednisolon of 40-100 ml intravenously each 8 h (or equivalent doses of Dexamethazonum, hydrocortisone) in dependence on clinical motion with next application of preparation усередину for 15-30 mg in

days. At the endocrinotherapy of antiestrogens is not abolished the cancer of breast;

## **SYNDROME OF DISINTEGRATION OF TUMOUR**

Treatment antitumor agents results in a necrocytosis and draws freeing of plenty of products of disintegration of tumor. In the protoplasm of cages contained much potassium, phosphorus, purins and other matters which flood intercellular spaces after the lysis of cages of malignant tumor. Such sudden receipt of plenty of products of cellular disintegration can exceed the capacity of organism for their selection, that, naturally, results in sharp violation of electrolyte and acidity-alkali equilibrium.

A syndrome of disintegration of tumor is the emergency state which is characterized development of lactate-acidity and electrolyte violations :

- hyperuricemia;
- hyperkalemia;
- hyperphosphatemia;
- hypocalcemia.

## **Etiopathogenesis**

More frequent the syndrome of disintegration of tumor is observed in the followings cases: quickly proliferate tumors with the presence of high-cube of tumor mass, acute leucosis, lymphadenomas of high degree of malignancy, some solid tumors.

An electrolyte disbalance results in violations from the side of many organs and systems (cardio-vascular, nervous, urination). The concentration of urinary acid is enhanceable in blood, settling-out of it in the combined teams kidney tubes, pelvis, ureters accompanied the sharp urate obstruction of urinoexcretory ways, that and is a basic factor in pathogeny of azotemia. For patients with the syndrome of disintegration of tumour quickly enough kidney insufficiency develops at ill-timed treatment of complication can result in a lethal result.



## **Clinical**

A clinical picture consists of symptoms of electrolyte, acidity-alkali violations. For the syndrome of disintegration of tumor the characteristic followings basic symptoms:

- from the side of the nervous system – violation of consciousness (up to a comma), paresthesia, tetany, epilepsy cramp;
- from the side of the cardio-vascular system – braducardia, arrhythmia, fibrillation of ventricles, diastole stop of heart;
- from the side of gastroenteric highway – cramps of smooth muscles, intestinal impassability;
- from the side of the urination system – azotomia, kidney insufficiency.

## **Prophylaxis and treatment of syndrome of disintegration of tumor**

Before the beginning of chemotherapy concerning leucosis, lymphadenomas or solid tumors with the large volume of tumor mass it is necessary to recommend fluid, pregidration therapy during 24 - 48h, introduction of allopurinol for 300 mg/day during a few days.

During the leadthrough of chemotherapy the desired monitoring of diuresis, hemodynamics, maintenance, is in the whey of blood of urinary acid, kreatinine, to potassium, calcium, phosphorus, correction of any metabolic violations.

## **Gyperphosphotomiya**

At a middle degree is a reception of hydroxid of aluminium in the dose of 300-600mg. At a heavy degree is introduction of solution of a 0,9% sodium of chloride in the volume of 1000-3000ml, hemodialysis.

## **Hypokalemia**

Reception of preparations of calcium perorally. Parenteral of introduction of solution of a 10% chloride or gluconate calcium for 5-10 ml during 10 min or

infusion during 20min. In the case of sharp hypocalcemia with expressed tetany is introduction of calcium of gluconate of a 10% solution of 20-40 ml during 10-15min, then infusion of calcium of gluconate of a 10% solution of 60 ml on 500 ml of isotonic solution. Too rapid introduction can cause feeling of heat, palpitation, or even collapse. Obligatory monitoring of maintenance in the whey of blood of calcium each 4-6 hours

### **Gyperkaliemiya**

It is necessary to halt the receipt of preparations potassium in an organism. Next medical measures are rotated in exigent situations:

- Infusion of calcium of gluconate of a 10% solution of 10-30ml (in default of digitalization) intravenously during more 2-5 min;
- Infusion of 50 ml of a 50% solution of glucose intravenously but with addition zinc-insulin of intravenously during more 5min.
- Infusion of solution 4,2-8,4% NaCl, 200-300ml. At sharp metabolic acidosis a dose is increased.
- Preparation of Kau-ekhalasi (ion-exchange resin) is 25,0-50,0 grammes perioral, to wash down 50 ml of a 70% solution of sorbitol, or 50,0 grammes of this preparation in a rectum in a 20% solution of glucitol.
- At a parafunction buds is a peritoneal dialysis or гемодіаліз.

### **Hyperuricemia**

Treatment includes the reception of allopurinol for 600-900 mg/24h during a few days under control maintenance of urinary acid in blood, hydrotherapy, introduction of diuretics. In heavy cases: at the increase of maintenance of urinary acid in the whey of blood more 20 mg/100 ml and signs of azotemia expedient leadthrough of hemodialysis.

### **3.3. RECOMMENDED LITERATURE**

#### **a) Basic**

1. Bondar G.V. Palliative medical: is for stud. V-VI of courses, / Bondar G.V., Vitenko I.S., Popovich O.Yu. – Doneck, 2004. – 80 c.
2. Lectures for clinical oncolodgy. Bondar G.V. – Lugansk, 2009. – 580 p.
3. Onkologiya familiary doctor/ Bashtan V.P., Zhdan V.N., Sheleshko P.V. – Poltava, 2005. – 100 p.

#### **b) Additional**

1. Oncology. Under editorship of B.T. Bilinskuy, Yu.M. Sternuk, I. In. Shparik. Is Kyiv: Health, 2004. – 527 p.

#### **c) Methodical**

V.E. Mileryan. are Methodical bases of preparation of leadthrough of lessons in the medical institutes of higher (methodical manual).- KYIV, Khreschatik. – 2003. – 80c.

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- **To know:**

- (a-II)
6. Etiology of the exigent states which arise up at the widespread forms of malignant new formations
  7. Clinical displays of the states which need urgent therapy
  8. Obligatory methods inspections sick with such pathology
  9. Basic methods treatments sick, which need urgent therapy
  10. To know risk groups

- **Able:**

- (a-III)
5. To conduct the general objective and special inspection of patients with the different variants of the complicated flow of cancer illness
  6. To define the value of additional methods of inspection for patients with the different variants of the complicated flow of cancer illness
  7. To appoint individual treatment of patients with the different variants of the complicated flow of cancer illness
  8. To appoint prophylactic measures on a fight against the different variants of the complicated motion of tumors.

## II. INTERDISCIPLINARY INTEGRATION.

Discipline	To know	Able
Anatomy	Structure of stomach, blood supply, lymph flow	
Stalemate. anatomy	Morphological changes at precancerous diseases and consisting of mucus layer of stomach, histological variants of malignant process	To estimate the results of cytological and histological researches
General surgery and therapy	Methods of physical, laboratory and instrumental inspections of stomach. Volume and principles of surgical treatment of diseases of stomach.	To conduct physical and clinical inspection of patients with the cancer of stomach. Able to read sciagrams at x-ray photography inspection of stomach

## 3. MATERIALS OF BEFORE AUDITORY.

**3.1.**Base knowledges, abilities, skills, necessary for a study themes (interdisciplinary integration)

Discipline	To know	Able
Radial diagnostics	Roentgenologic signs of primary tumors and metastases impressions of bones	To read sciagrams and computer sciagrams
General surgery and therapy	Methods of physical, laboratory and instrumental inspections of the staggered organs and regions.	To conduct physical and clinical inspection of patients with the tumor impressions of different organs.
Neurology	Topical of different levels of the impression of the nervous system	To conduct the primary review of patient with the exigent oncologic state and appoint the initial volume of the first aid.
Anesthesiology and reanimation	Pharmakokinetics of analgetics, anti inflammatory, respiratory and	Able to appoint urgent therapy at the exigent states

	cardiac	
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### **3.2. Table of contents of theme.**

General and local influence of tumor process on an organism, changes, caused radical therapy and chemotherapy both at primary and at repeated, influence, volume, character and duration of operative interference, anaesthesia, features of flow of postoperative period are all of these factors, which meet in different connection, determine somatic status of oncologic patients, create the danger of development of critical conditions on any stage of the combined and complex treatment.

Disorders of physiology functions and violations of activity of the separate systems which can not be spontaneously corrected by self-regulation stipulate development of critical condition of patient. The clinical displays of critical condition are determined development of partial (total) organ or polyorgans insufficiency, for the removal of which it is needed not only correction but also substituting therapy. Pathology, related to the local impression of that or other organ, can depart on the second plan, and on the first the syndromes of critical condition (hypovolemia, violation of hemorheology, sharp respiratory and cardiovascular insufficiency and other), removal of which, come forward then, and more correctly is warning — primary concern of intensive therapy. Presently there are the real possibilities of warning and treatment of critical conditions for oncologic patients, that will allow to promote efficiency of the combined and complex treatment on the whole and each of his components.

An emergency situation can arise up and as the first display of malignant tumor.

### **Compression of spinal cord**

A compression of spinal cord is heavy and frequent complication of oncologic disease. An early diagnosis and rapid beginning of treatment is the decision



factors of prevention of damage the function of spinal cord which is characterized paresises/paralyses as violation of activity of organs of small pelvis.

### **Etiopathogenesis**

For the oncologic patients of prelum of spinal cord it can be contingently metastases in epidural space, which damages an action, intramarrow metastases, change of vertebrae and haematoma, bone fragments in subdural space of spinal cord.

Metastases in epidural space of spinal cord are the most frequent reason of his compression for oncologic patients. The impression of epidural space takes a place in various ways. A typical variant is a metastasis in a neurocentrum with the next invasion of front epidural space. Most often it is at to the metastatic cancer of breast, lung, prostatic, kidney, tumors of gastroenteric highway. Juxtaspinal tumors can get to the spinal channel by direct distribution through the intracostal openings. This way is typical for lymphosarcomas. Gematogenni metastases in epidural space or matter of spinal cord are observed rarely.

On principle the compression of spinal cord can be observed at any level, however more frequent is at the level of pectoral part (70%), rarer - lumbar (20%) and neck (10%).

The clinic of compression of spinal cord is characterized tetrad of clinical symptoms: **by pains, weakness, disfunction of the vegetative nervous system (by a parafunction pelvic organs), violation of sensitiveness.**

Presence each of these symptoms can testify to the compression of spinal cord.

Pain local or for it is been the type of redicular syndrome the first symptom in 95% patients with a tumor process in epidural space.

A pain syndrome passes ahead appearance of other symptoms on a few weeks or months. Localization of pain usually answers level tumor. Such ac-

cordance is not observed sometimes, and pain can be marked both higher, and below areas of compression of spinal cord.

A sickly syndrome is conditioned a stretch or compression of periosteal receptors or compression of vertebra, and also by the stretch of nerves. Pains can increase at a cough, stretch and in position on the back, but can be such that irradiation, that hampers diagnostics substantially.

A making progress muscular weakness is observed in 76% patients with the compression of spinal cord and more frequent appears complaints about weight and «phizomelic» of lower extremities, their «dragging», at walking.

Disfunction of the vegetative nervous system is marked in 57% patients as sharp or gradually increasing parafunctions organs of small tазa. This symptom is one of the most heavy displays of compression of spinal cord and is an unfavorable factor.

Violations of sensitiveness (paresthesia, anaesthesia, hypercraesthesia) mark 51 % patients.

The careful questioning of patients and attentive inspection allow to set time of beginning of compression of spinal cord and its level [2].

At the compressions of spinal cord higher level of ThXII – LI, as a rule, a clinical picture which includes a muscular weakness in lower extremities develops, thermoanaesthesia, parafunction pelvic organs, and sexual disorders. Compression of spinal cord of caudal of Th I, accompanied a lower paraplegia or paraparesis with the maintainance of function of overhead extremities. If a compression takes a place higher S5, tetraplegia develops and tetraparesis.

At the compression of distal part of spinal cord there are symmetric pains in a perianal area with an early thermoanaesthesia in the area of crotch. A compression in an area (cauda equina) (between LI, and SIII), as a rule, appears asymmetric, segmental violations of motive and perceptible character in lower extremities.

Potentially by mortal complication metastatic defeats of neck vertebrae are subluxation in atlantooccipital connection. Metastases in the II neck vertebra conduce to the pathological break of «tooth» of vertebra a partial change, which a compression of neck segments of spinal cord which is accompanied the stop of breathing is as a result of.

Most patients with metastases in overhead neck vertebrae grumble about the sickly feelings in overhead parts necks which increase at the turns of chairman, with a possible irradiation in a shoulder or shoulder-blade. Pain is in the area of neck, spasm near vertebral muscles, limitation of motions in the neck part of spine is permanent violations to the moment of establishment of diagnosis. At distribution of process appear weakness in lower extremities, loss of equilibrium, insolvency of sphincters of rectum and urinary bladder, dizziness, dysarthria, difficulty, at swallowing.

### **Diagnostics of compression of spinal cord**

Neurological and physical inspection : percussion of spine, estimation of motive and sensory weakness, passive bending of neck, getting up of erect leg, rectal inspection (estimation of tonus sphincter), «pin» test, from the fingers of foot to the chairman for establishment of level of sensitiveness.

Sciagraphy research. At sciagraphy in a direct projection the characteristic changes of bodies of vertebrae at the level of compression of spinal cord find out in 91% patients with epidural metastases.

Radioisotope research of marrow.

Computer tomography of spine is with introduction of contrasting matter.

Magnetically-nuclear-resonance tomography with contrasting owns the greatest sensitiveness and specificity for determination of compression of spinal cord and is a standard for his diagnostics .

### **Treatment of compression of spinal cord**

As soon as a diagnosis is clear, it is necessary to begin treatment, because quite often a weakness is expressed during a few hours can pass to the irreversible paraplegia.

#### Exigent measures.

Immobilization of spine, if such was not, by a hard shield, special orthopaedic corsets, collars.

Setting of corticosteroids hormones which diminish the edema of spinal cord (high doses of dexamethason are after the following chart: single introduction of 20 mg dexamethason intravenous with next application of preparation perorally for 8 mg (16 pills) in days the first 10 days, then for 4 mg (8 pills) in days during 2 weeks, then is a supporting dose for 2 mg (4 pills) constantly. It is suggested to utilize the following mode of introduction of dexamethason some authors : to 100 mg preparation intravenously in the first days and in the following is introduction of dexamethason for 4 mg intravenous through each 6 hours

Parallell with Dexamethazonum the diuretic are appointed, preparations to potassium, facilities that improve cerebral circulation of blood, vascular preparations. In the last few years plenty of researches is conducted with the purpose of optimization treatments sick with the syndrome of compression of spinal cord. However much the question of medical tactic remains unsolved, especially in the part regarding to a choice between operative treatment or radial therapy.

- **Radial therapy** is one of the most effective methods of treatment of this complication and allows to obtain a positive medical effect in 30-50% cases.

A testimony is to radial therapy: presence of radiosensitive tumor (cancer of breast, cancer prostatic, plural meielow, neuroblastoma), clinical signs of stability of spine, contra-indication is to operative treatment. Radial therapy can be conducted patients with the plural hearths of compression or slow motion of syndrome of compression of spinal cord.

- **Surgical treatment** keeps the value. A standard operation is consider a decompression laminectomy. Some researchers are offer the operations of resec-

tion of bodies of vertebrae from after their prosthetics by synthetic fabrics or strengthening metallic plates.

Testimony to surgical treatment it is possible to formulate by such method: clinical signs of instability of spine, prelum of nervous barrels as a result of direct distribution of tumor, located juxtaspinal, solitary of the focus impression in default of progress of other hearths, unbearable pains which require narcotic analgetics in large doses, unperceptible to radial therapy tumors, relatively the satisfactory general state of patient and expected life-span more 6 months.

A chemotherapy can be conducted as the first line for tumors, perceptible to the cytostatics.

## **SYNDROME OF PRECAVA**

A syndrome of overhead empty vein (SVPV) is the exigent state, related to violation of circulation of blood in the pool of overhead empty vein. Lately this state meets a bit more frequent in connection with an increase numbers sick by a cancer lung which are principal reason of this state. SVPV is the most used term which it is accepted to mark pathology.

### **Etiopatogenez**

Reason of development of SVPV are three basic pathological processes: compression of vein from outside, germination of wall of vein by a malignant tumor, thrombosis of overhead empty vein.

To the malignant tumors which most are often (80-90%) complicated SVPV, the followings belong: lymphadenomas, more frequent diffuse lymphoblastic with localization in front mediastinum, cancer lung, especially right, metastatics forms of breast cancer, testicle, gastroenteric highway, sarcoma, especially malignant fibrotic histocytoma, melanoma.

Among other reasons which result in SVPV, it should be noted: infectious diseases – tuberculosis, syphilis, thromboses (traumatic, spontaneous or as a result of

the second defeat of vessels of mediastinum), paratherapeutic reasons, idiopathic fibrotic mediastinitis, cardiovascular insufficiency, retrosternal goitre.

The clinical picture of SVPV is related to the increase of intravascular venous pressure in areas, a venous outflow from which in a norm is drained through a precava or formative it nameless veins. Deceleration of speed of blood stream, development of venous collateral, symptoms, related to the basic disease, is the components of SVPV. Expressiveness of different signs of SVPV depends on speed of development of pathological process, level and degree of compression of road clearance of precava and adequacy of collateral circulation of blood.

### **Clinical displays and results of objective inspection**

A clinical flow of SVPV can be sharp or slowly making progress. The complaints of patient are extremely various: head pain, nausea, dizziness, change of exterior, hoarseness of voice, cough, odynophagia, pains, is in a thorax, breathing, shortness of breath, somnolence is laboured, fainting fit, cramp. The most characteristic signs of SVPV appear at a physical inspection: expansion, flowdown of veins of neck, pectoral wall and overhead extremities, was swollen person, neck or overhead humeral belt, cyanosis or plethora of person.

### **Diagnostics**

For diagnostics of SVPV it can be enough information of clinic and physical inspection. In default of morphological diagnosis it is necessary leadthrough of all of possible researches for verification of pathological process: cytological research of sputum, bronchoscopy with a biopsy and cytological research of washings off from bronchial tubes, mediastinoscopy, with a biopsy, biopsy of lymphatic nodus, sternal puncture et cetera

Sciagraphy of thorax in a line and lateral projections and tomography is rotined all of patients in the cases of the exigent states or with suspicion on violation of communicating of precava. Roentgenologic research allows to find out a pathological process in mediastinum, degree of his distribution and to define borders for next radial therapy.

Computer tomography with contrasting allows to specify the contours of tumor process, degree of the impression of lymphatic nodus of mediastinum.

Dopplerivske ultrasonic research of carotic or supraclavicular veins can help in differential diagnostics between a thrombosis and obstruction from outside.

Not recommended introduction of radiocontrast or other matters to the vein of the staggered extremity through the high risk of extravasate. However in liquid cases conduct a phlebography for the exposure of localization and degree of violation of communicating of precava. A phlebography appears useful to differential diagnostics of vascular and out vessel character of the impression, decision of question, about resectableness, determination of length of the staggered segment.

## **Treatment**

Optimum treatment depends on reasons which caused SVPV, and speed of development of symptoms of progression .

It is possible to begin in the sharp situation of treatment, not having an exact morphological diagnosis. Urgent symptomatic measures are the lives of patient directed on a rescue, they are needed, to provide entering of air lungs, to liquidate impassability of precava and compression of organs of mediastinum. Except for rest, enhanceable position, oxygentherapy, sometimes can may need tracheostomy, intubation, introduction of anticonvulsant facilities. Application of diuretics and corticosteroids is rotined. Introduction of hydrocortisone is recommended from 100 to 500 mg intravenous with the next decline of dose each 6-8 ч taking into account a clinical picture or setting of prednisolon of 60-90 mg intravenous, then for 40-60 mg in days perorally.

**Radial therapy** large factions is by the high-efficiency method of treatment of SVPV, especially at to the cancer lung. Efficiency of it arrives at 70-90% . The irradiation of thorax must begin as possible before. The leadthrough of exigent radial therapy is needed at respiratory insufficiency (including stridor breathing) or at presence of symptoms from the side.

Chemotherapy of treatment as it is better to conduct the first line at presence of fuzz tench, highly sensitive to cytostatics

The combined therapy (chemotherapy and radial therapy) is rotined at to the small cell cancer lung. However related a simultaneous leadthrough of chemotherapy and radial therapy often is to the increase of number of complications (odynophagia, neutropenia) that is why more repressing the stage-by-stage combined therapy (at first treatment, and then irradiation, cytostatics or vice versa).

Treatment anticoagulants or fibrinolytin preparations is rotined at the thrombosis of vein. But these preparations must not be appointed standard, after the exception of those cases, when on a phlebography the thrombosis of overhead empty vein is diagnosed or the signs of improvement absent at treatment other methods.

## **HYPERCALCEMIA**

Hypercalcemia for oncologic patients - most frequent threatening life of violation of metabolism, as a rule, circulating character which arises up at widespread malignant tumors.

### **Etiology**

Hypercalcemia with most frequency meets at the followings tumors: cancer of lung, cancer of breast, cancer of ovaries, cancer of kidney, plural mieloma, tumors of head and necks, lymphoblastomas, to new formation with unknown localization of first tumor, a bone, mainly lysis character, has solid tumors with metastases.

### **Mechanism of development of hypercalcemia:**

Two mechanisms of development of this complication are known:

- local metastasis destruction of bones;
- generalisation ossifluence, conditioned the selection of some humeral factors a tumor.

There is strengthening of bone resorption in both cases.



Direct local invasion of bone fabric stimulates freeing of calcium tumor cages, activated osteoclasts, in blood to the level which exceeds excretory possibilities of kidney. Bone resorption is increased cytokines and by other factors which are produced invasion tumor cages. Most often this mechanism of hypercalcemia is observed at a myelomatosis, cancer breast.

Humoral hypercalcemia is observed for patients a cancer lung and kidney in which metastases can absent in cysts. In this case a clinical picture answers hyperparathyroidism, and a delete or regression of primary tumor under the action of cytostatics therapy results in disappearance of hypercalcemia. Main reason of development of this state is an ossifluence and kidney D-major of calcium is increased as a result of products by tumor fabric of hormonal albumen. It is marked that tumor cages are with expression of hormones, more frequent metastasis in bones, what in other organs and fabrics.

Hypercalcemia result in violation D-major of sodium and water, causing polyuria («calcium diuresis»), the volume of circulatory blood and intertissue liquid goes down accordingly. There is the reserved circle: hypovolemia results in the decline of kidney blood stream, that, in same queue, diminishes the degree of glomerular filtration, and this violation causes the increase of D-major of calcium in the proximal parts of kidney tubulis. Worsen the state of dehydration and frequent vomit.

### **Clinic and diagnostics**

The clinical picture of hypercalcemia contains changes from the side of different organs and systems:

- general symptoms are dehydration, weakness, decline of mass of body, thirst;
- central nervous system are head pain, hypoflexia, proximal miopathy, apathy, breaknes, psychical violations, cramps, to confusional consciousness, comma;

- a gastroenteric highway is an anorexia, nausea, vomit, locks, intestinal impassability, pancreatitis, flatulence, increase of gastric secretion and pepsin-ia;
- the cardio-vascular system is bradycardia, low blood pressure, arrhythmia, asystole, is prolonged;
- urination system is polyuria, azotomia, kidney insufficiency, comma.

If the correction of hypercalcemia is not conducted, dehydrotation (diminishing of volume of liquid), kidney insufficiency, comma and death develops consistently. In the case of adequate treatment of this complication and next prophylaxis of relapses patients can live during many months and even years.

A presence or absence of clinical symptoms and degree of their expressiveness little depend on the degree of hypercalcemia. Possible and asymptomatic flowing of complication. Mainly clinical symptoms appear at the level of calcium in the whey of blood higher 2,9-3,0 mmol/l. It is accepted heavy to count hypercalcemia 3,7 mmol/l or higher. It requires exigent treatment. When the level of calcium becomes even 3,7-4,5 mmol/l or higher, a comma and stop of heart develops.

It should be noted that hypercalcemia is often diagnosed too late or not set in general, because doctors is inclined to interpret a lot of symptoms (weakness, dormancy, dyspeptics disorders, anorexia) as displays of progress of oncologic disease.

## **Treatment**

Every case of hypercalcemia requires exigent measures. Patients from hypercalcemia require the permanent monitoring of indexes: hemodynamics, diuresis, water and electrolyte balance, central venous pressure, creatinine, urea of blood. Active therapy includes proceeding in the volume of circulatory blood and pharmacological correction of hypercalcemia by the increase of secretion of calcium and blocking of bone resorption.

Many authors are offer the following chart of treatment:

- rehydrotation – introduction of isotonic solutions (3-6 l of 0,9% soluble-sodium chloride in days or 300-400 ml at o'clock each 3-4 h). The desired support of central of venous pressure is at the level of 10 sm of water colum;
- diuretic preparations on a background conducted rehydrotation at satisfactory haemodynamic indexes with support of diuresis of 150-200ml/h. Advantage gives oneself up «glomerular diuretics» - furosimid for 20-40 mg intravenously each 2-4h;
- corticosteroid is prednisolon of 40-100 ml intravenously each 8 h (or equivalent doses of Dexamethazonum, hydrocortisone) in dependence on clinical motion with next application of preparation усередину for 15-30 mg in days. At the endocrinotherapy of antiestrogens is not abolished the cancer of breast;

## **SYNDROME OF DISINTEGRATION OF TUMOUR**

Treatment antitumor agents results in a necrocytosis and draws freeing of plenty of products of disintegration of tumor. In the protoplasm of cages contained much potassium, phosphorus, purins and other matters which flood intercellular spaces after the lysis of cages of malignant tumor. Such sudden receipt of plenty of products of cellular disintegration can exceed the capacity of organism for their selection, that, naturally, results in sharp violation of electrolyte and acidity-alkali equilibrium.

A syndrome of disintegration of tumor is the emergency state which is characterized development of lactate-acidity and electrolyte violations :

- hyperuricemia;
- hyperkalemia;
- hyperphosphatemia;
- hypocalcemia.

## **Etiopathogenesis**

More frequent the syndrome of disintegration of tumor is observed in the followings cases: quickly proliferate tumors with the presence of high-cube of tumor mass, acute leucosis, lymphadenomas of high degree of malignancy, some solid tumors.

An electrolyte disbalance results in violations from the side of many organs and systems (cardio-vascular, nervous, urination). The concentration of urinary acid is enhanceable in blood, settling-out of it in the combined teams kidney tubes, pelvis, ureters accompanied the sharp urate obstruction of urinoexcretory ways, that and is a basic factor in pathogeny of azotemia. For patients with the syndrome of disintegration of tumour quickly enough kidney insufficiency develops at ill-timed treatment of complication can result in a lethal result.

## **Clinical**

A clinical picture consists of symptoms of electrolyte, acidity-alkali violations. For the syndrome of disintegration of tumor the characteristic followings basic symptoms:

- from the side of the nervous system – violation of consciousness (up to a comma), paresthesia, tetany, epilepsy cramp;
- from the side of the cardio-vascular system – bradycardia, arrhythmia, fibrillation of ventricles, diastole stop of heart;
- from the side of gastroenteric highway – cramps of smooth muscles, intestinal impassability;
- from the side of the urination system – azotemia, kidney insufficiency.

## **Prophylaxis and treatment of syndrome of disintegration of tumor**

Before the beginning of chemotherapy concerning leucosis, lymphadenomas or solid tumors with the large volume of tumor mass it is necessary to recommend

fluid, prehydration therapy during 24 - 48h, introduction of allopurinol for 300 mg/day during a few days.

During the leadthrough of chemotherapy the desired monitoring of diuresis, hemodynamics, maintenance, is in the whey of blood of urinary acid, kreatinine, to potassium, calcium, phosphorus, correction of any metabolic violations.

### **Gyperphosphotomiya**

At a middle degree is a reception of hydroxid of aluminium in the dose of 300-600mg. At a heavy degree is introduction of solution of a 0,9% sodium of chloride in the volume of 1000-3000ml, hemodialysis.

### **Hypokalemia**

Reception of preparations of calcium perorally. Parenteral of introduction of solution of a 10% chloride or gluconate calcium for 5-10 ml during 10 min or infusion during 20min. In the case of sharp hypocalcemia with expressed tetanyis introduction of calcium of gluconate of a 10% solution of 20-40 ml during 10-15min, then infusion of calcium of gluconate of a 10% solution of 60 ml on 500 ml of isotonic solution. Too rapid introduction can cause feeling of heat, palpitation, or even collapse. Obligatory monitoring of maintenance in the whey of blood of calcium each 4-6 hours

### **Gyperkaliemiya**

It is necessary to halt the receipt of preparations potassium in an organism. Next medical measures are rotined in exigent situations:

- Infusion of calcium of gluconate of a 10% solution of 10-30ml (in default of digitalization) intravenously during more 2-5 min;
- Infusion of 50 ml of a 50% solution of glucose intravenously but with addition zinc-insulin of intravenously during more 5min.
- Infusion of solution 4,2-8,4% NaCl, 200-300ml. At sharp metabolic acidosis a dose is increased.

- Preparation of Kau-ekhalasi (ion-exchange resin) is 25,0-50,0 grammes perioral, to wash down 50 ml of a 70% solution of sorbitol, or 50,0 grammes of this preparation in a rectum in a 20% solution of glucitol.
- At a parafunction buds is a peritoneal dialysis or гемодіаліз.

### **Hyperuricemia**

Treatment includes the reception of allopurinol for 600-900 mg/24h during a few days under control maintenance of urinary acid in blood, hydrotherapy, introduction of diuretics. In heavy cases: at the increase of maintenance of urinary acid in the whey of blood more 20 mg/100 ml and signs of azotemia expedient leadthrough of hemodialysis.

## **3.3. RECOMMENDED LITERATURE**

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