LECTURE 5

TRAUMATISM. FRACTURE. JOINT DISLOCATION.

I. Actuality of theme. Injury can be defined as damage to the body caused by acute exposure to energy. Trauma is the medical term used to denote injury and usually refers to life-threatening or serious injuries that require specialized surgical care if the patient is to survive without disability. As a "disease" trauma represents a major public health problem. Trauma causes more than 140,000 deaths per year in the United States, is the leading cause of death for those aged 1-34 years, and causes more years of lost productivity before age 65 years than coronary artery disease, cancer, and stroke combined. In 2005, more than 50 million Americans underwent medical treatment for an injury. The estimated lifetime cost of these injuries is believed to be $406 billion. Because trauma affects mainly a young population, it results in the loss of more working years that all other causes. What is the most tragic is that is many as 40% of all trauma death could be avoided by preventive measures and by the esthablishment of regional trauma system that would expedite the evaluation and treatment of seriously injured people.

II. Aims of lecture :

Educational:

- To describe the hystori of traumatology and orthopedic surgery (β=I) ;
- To elucidate the epidemiology of trauma (β=I);
- To characterize the mesures for prevention of trauma (β=I) ;
- To study the students to perform evaluation of the trauma patients (β=II) ;
- To expound classification, diagnostic and first aid for head, neck, thoracic and abdominal injuries (β=II) ;
- To describe the classification of fractures and dislocations (β=II) ;
- To study the students to perform diagnostic of fractures and dislocations (β=II);
- To describe the medical and surgical treatment of fractures (β=II);
- To characterize the phases of fracture healing (β=II);
- To give the students knoweledge about first aid for patients with fractures and dislocations(β=II);
- To study the students the main principles of evidence-based medicine according the subject of lecture (β= IV).

Educative:

1. To develop deontological notion in the students, to study the students carry our deontological approach to patients with trauma.
2. To educate for students sense of responsibility for every prescription, research, procedure, manipulation or surgery, for a health and renewal of capacity of patient, for the rightness of adequate estimation of the common state of patients and grant of timely effective treatment.

III. Plan and organization of structure of lecture

№	Basic stages of lecture and their maintenance	Aims are in the levels of abstraction	Type of lecture, methods and facilities of activation of students, equipment	Division of time
1	Preliminary stage. Determination of educational aims and motivation.		Items I, II	5%
2	**Basic stage. Teaching of lecture's material** Epidemiology of trauma; History of traumatology; Prevention of trauma; Evaluation of the trauma patients; Head, neck, thoracic and abdominal injuries (classification, diagnosis and first aid); Classification of fractures and dislocations; Diagnostic of fractures and dislocations; Medical and surgical treatment of fractures; Phases of fracture healing; First aid for patients with fractures and dislocations.	 I I I II II II II II II	Type of lecture – thematic (with controversial elements – critical analysis of results of meta-analyses, randomized controlled, trials, guidlines which are devoted for the problems of anesthesiology, intensive care and resustitation). Facilities of activation of students are a questions, controversial situations, illustrative material	85%
3	Final stage (resume of lecture, general conclusions, answers to the possible questions, task for students for preparation for practical classes)		List of literature, question, task for students	10%

IV. Subject of a lecture

As injury or trauma named sudden effect of the external agent calling in tissues and organs anatomic disturbances, which are accompanied by local and general response of an organism. The science which investigates conditions, preventive maintenance and treatment of traumas — is named traumatology. Orthopedic surgery or orthopedics is the branch of surgery concerned with acute, chronic, traumatic, and overuse injuries and other disorders of the musculoskeletal system. Orthopedic surgeons address most musculoskeletal ailments including arthritis, trauma and congenital deformities using both surgical and non-surgical means.

History. Jean-Andre Venel established the first orthopedic institute in 1780, which was the first hospital dedicated to the treatment of children's skeletal deformities. He is considered by some to be the father of orthopedics or the first true orthopedist in consideraton of the establishment of his hospital and for his published methods. Antonius Mathysen, a Dutch military surgeon, invented the plaster of Paris cast in 1851. Many developments in orthopedic surgery resulted from experiences during wartime. On the battlefields of the Middle Ages the injured were treated with bandages soaked in horses' blood which dried to form a stiff, but unsanitary, splint. Traction and splinting developed during World War I. The use of intramedullary rods to treat fractures of the femur and tibia was pioneered by Dr. Kunchner of Germany. This made a noticeable difference to the speed of recovery of injured German soldiers during World War II and led to more widespread adoption of intramedullary fixation of fractures in the rest of the world. However, traction was the standard method of treating thigh bone fractures until the late 1970s when the Seattle Harborview group popularized intramedullary fixation without opening up the fracture. External fixation of fractures was refined by American surgeons during the Vietnam War but a major contribution was made by Gavril Abramovich Ilizarov in the USSR. He was sent, without much orthopedic training, to look after injured Russian soldiers in Siberia in the 1950s. With no equipment he was confronted with crippling conditions of unhealed, infected, and malaligned fractures. With the help of the local bicycle shop he devised ring external fixators tensioned like the spokes of a bicycle. With this equipment he achieved healing, realignment and lengthening to a degree unheard of elsewhere. His Ilizarov apparatus is still used today. David L. MacIntosh pioneered the first successful surgery for the management of the torn anterior cruciate ligament of the knee. This common and serious injury in skiers, field athletes, and dancers invariably brought an end to their athletics due to permanent joint instability. Working with injured football players, Dr. MacIntosh devised a way to re-route viable ligament from adjacent structures to preserve the strong and complex mechanics of the knee joint and restore stability. The subsequesnt

development of ACL reconstruction surgery has allowed numerous athletes to return to the demands of sports at all levels.

Frequency. Traumatic injures takes the third place in general morbidity (12,7 %), conceding an influenza and acute catarrh of the upper respiratory paths, and also cardio-vascular diseases. At mail trauma meets in 2 times more often, than at the femail. Trauma takes the first place in general morbidity of a mail in age from 15 to 29 years. On conditions of origin of a trauma it is possible to divide into three groups: industrial, non- industrial and military.
Industrial traumatism divide on: a) industrial; б) agricultural.
Non-industrial traumatism: a) transport; б) street; в) children's; г) domestic; д) sports; е) deliberate.
Military traumas: a) bullet damages; б) the closed damages.
By the form of damaging agent are selected: 1) mechanical; 2) chemical; 3) thermal; 4) radial; 5) fire; 6) combined.
Kinds of mechanical traumas. Select the closed traumas, at which skin and mucous not damaged, and opened, accompanied by damage of mucous and skin, that sharply increases danger of microbic contamination of damaged tissues and results in complications, occasionally very hard (tetanus, osteomyelitis, gas gangrene).
Distinguish uncomplicated and complicated damages; on time of development of complication can be direct, arising at the moment of damage or at the first hours after it (shock, bleeding, damage of the vitally important organs). The complications arising in various terms (from several hours about several weeks after a trauma), which reason is the surgical infection (local purulent infection-suppuration of wounds, peritonitis, pleuritis etc. or general purulent infection - sepsis, gas gangrene, tetanus) are nearest complications. The late complications occur in the remote terms after damage and are connected to development of a chronic purulent surgical infection (chronic osteomyelytis, fistulas etc.).
Depending on character of damage of a trauma can be simple, which is the damage of one organ or its part (fracture), and combined, at which are combined various localization of damage and various injuring factors (fracture of a leg both frostbite of feet).
Depending on damage of hollow organs distinguish traumas penetrating in a cavity (abdominal, chest, cranial, joint), which can bring a number of serious complications - bleeding, peritonitis, pneumothorax, contamination of cavity, and not penetrating.
Select also traumas: direct, arising immediately on a place of the injuring factor (fractures of feet, forearms at a falling of a heavy subject or impact), and indirect, arising in the field of remote from a place of operation of injuring force (fracture of a backbone at a falling on tubers of ischium). Acute traumas arise at sudden single effect of the injuring factor; the chronic traumas develops in an outcome of long duration repeated effect of the injuring agent (callositas, Dupuitren's contracture

etc.). The weight of damages and their consequences is determined by the several factors.

1.Mechanism of a trauma and external factor called damage: the heavy and rigid subjects call heavier destructions of tissues, than light, soft subjects; acute subjects more often call opened damages, and obtuse - closed. Has value thermal and chemical condition of the injuring agent. The large role is played and direction of injuring force, angle of its operations, speed and duration. The study of the mechanism of a trauma has large value for the diagnosis, for example, fractures and determination of singularities of damage (kind of a fracture: oblique, cross-sectional, spiral etc.). At the certain mechanism of a trauma usually there are typical damages: so, at a falling on a palm of prolated hand it can be a fracture of radial bone in a typical place, spiral shin bone fracture on a slippery road).

2.Anatomo-physiological singularities of organs and tissuess. Parenchymal organs (liver, spleen, brain) has small stability to damage at effect even of small force. Anatomic singularities of a skin makes its steady against effect of the injuring factor, owing to what quite often at a wholeness of skin, of abdominal wall or cranial box the heavy destructions of deep tissues are observed: the closed fractures, ruptures of internal organs, massive crushing of soft tissues. Significant stability to damage has osseous tissue. The essential value has a physiological condition of a organ: the bullet wounds of a stomach or small intestine, when they are overflowed by food, result in the greater rupture, that it is necessary to take into account also at an obtuse trauma of a stomach (impact, falling). At the same time wound of an empty organ limits by formation of inlet and outlet orifices according to the size of injuring subject. At the old and elderly people the physiological changes of osseous tissue result in greater fragility of bones and more often result in damage even at a minor trauma.

3. The pathological changes of organs and tissues results in their less steady against a trauma: the small effort suffices for their damage. The rupture of pathologically changed spleen at malaria can arise at turn in bed, spleen while the rupture of spleen at healthy personne happens in an outcome of significant effect on the lower ribs at the left site of chest; at defeats of bones by tumours, osteomyelitis there are pathological fractures at a minor trauma. The factors reducing stability of organs and tissues to effect of the injuring agent, can be also disturbances of nutrition and methabolism, anaemias, avitaminosises.

4. The unfavorable conditions of external environment can considerably complicate current of damage: the trauma on cold frequently is complicated by a heavy shock; frostbite, supercooling in a combination with fracture can become complicated by development of pneumonia, osteomyelitis, endarteritis, heat and contamination of a wound by ground, by scraps of clothes sharply increase microbic contamination of a wound and danger of purulent complications.

5. General condition of an organism: depressing of immunitny, allergic responses, alcoholism, the disturbances of methabolism reduces stability of an organism to trauma and results in development of a shock, infectious complications etc.

Main method of diagnosis of character of traumatic damages is clinical. To diagnostics apply special methods of examination of the patients with trauma and complications of traumas.

Anamnesis. At traumatic damages it is very important to find out the their origin, as it plays a role both in diagnostics and in prophylaxis of industrial traumatism. At finding out of the mechanism of a trauma already from the story of patient it is possible to put the preliminary diagnosis and to plan the examination (for example: the falling on a prolated hand results usually in a radial bone fracture in a typical place or fracture of head of humerus, the falling from altitude on buttocks results in compressive fracture of lumbal vertebrae). The examination of the patient and place of a trauma even without special vehicles can give the valuable information for the diagnosis, it is possible to assume localization and character of damage. It is necessary carry out comparative inspection of healthy and injured limbs. At inspection of damaged organ which has undergone to a trauma, distinguish three basic positions: passive, active and conditional.

1.The passive position of whole body is characteristic of heavy damages at a unconscious condition of patient, at damage of a head or spinal marrow with presence of a paralysis. The passive position of a limb is possible for example, at fracture (fracture of neck of thigh-bone- the damaged limb is passive roteted outsude), at damage of large nerves (the passive position of a limb and absence of active motions).

The conditional position of a limb is observed at dislocations, fractures in acute period or at incorrectly accrete bone fracture or at development of ankylosis. At examination of patient it is very important to find out change of position of a limb concerning an axis of a limb. Axis of the upper and lower limbs varies at fractures, dislocations, and also at incorrectly accrete fractures of bones of limbs, ankylosis. The change of an axis can be of congenital character or at curvature of bones at their disease (for example, at rachitis).

The examination allows to reveal change of a damaged organ and flattening of an outline of a joint at hemarthrosis, swelling at hematoma of soft tissues, deformation of a limb at fracture etc.

Palpation is a following investigation phase. At palpation of a place of trauma determine presence of the induration, swelling. At fractures of a jaw palpation is performed through a oral cavity, at a fracture of coccygeal bone through rectum. It is possible to determine presence of fluid in a joint (for example, floating patella at hemarthrosis, synovitis). Palpation allows to determine a defect of tissues as retraction (at a ruprure of a muscle, sinew).

Auscultation has large value at damages of organs of pectoral or abdominal cavites, allows to reveal the changes which have arisen owing to a trauma (for example, absence of peristalsis at posttraumatic peritonitis; attenuation or absence of breathing at damages of lungs, pneumo- and hemothorax; and characteristic noise at posttraumatic aneurism).
Determination of motions in a joint begin from finding out of capability of active motions produced by patient. The capability of production of passive motions is determined by the doctor. Thus install fact of absence of active or passive motions or limitation, sickliness at motions. The measurements of volume of motions in a joint registered in degrees, make by goniometer. The changes of volume of motions in joints can be various: from a full immovability (ankylosis) to limitation of motions (contractura).

The important place in examination of the patient with trauma takes measurement of length of a limb. The measurement of length can be produced on an eye by comparative comparison symmetric of departments of finitenesses among themselvessymmetric comparison of separate segments and levels symmetrically located osseous of ledges among themselves. Length of and finiteness varies at fractures, dislocations.

Circle of and finiteness measure at identical levels of symmetrical departments of finitenesses. The difference in and circle of and finiteness at the patient who has transferred a trauma of a limb, oedema indicates increase of volume of one limb at hematoma, effusion of blood, displacement of osseous fragments.

X-ray methods of research in traumatology plays a main role. Roentgenograms make in two projections direct and lateral, and if necessary a in other projections. At fractures, dislocations roentgenogram allows to determine character of displacement of fragments at a fracture and of articulate ends bone at dislocations, and the repeated researches allows to inspect effectiveness of reposition of fragments, elimination of a dislocation to estimate outcomes of treatment, union of bones etc.
In traumatology are used also radiopaque methods: arthrography-contrast research of joints, angiography-research of vessels etc.
Tomography allows to receive x-ray image of bone and other organs on various depth; the level-by-level snapshots give also capability to detail damages of organs, to reveal foreingh bodies.
At examination of the patient with traumatic damages and their consequences use functional methods of research for definition of blood flow - ultrasonic dopplerography, rheography, oscillography. To research of condition of contractive ability of muscles apply electromyography.
Kinds of the help to patient with trauma:

- ✓ himself and the mutual aid given to patient himself or by people, near him;
- ✓ the help before hospitalisation given by the medical assistant on a first-aid post;
- ✓ the first medical aid given by the doctor on doctor's item or on item of the urgent help;
- ✓ the qualified help given by the doctor traumatologist (surgeon) in polyclinics, specialized machine of first aid and traumatologic (surgical) hospitals;
- ✓ the specialized help given by the doctors depending on character of a trauma and kind of damage in specialized departments or hospitals.

Shock

The shock is accompanied by steep depressing of a central nervous system and blood circulation, develops under influence of a trauma (wound, burns, bleeding, electrotrauma etc.), some diseases (infarct of the myocardium, peritonitis, sepsis etc.), immunologic conflicts (transfusion of blood, incompatible on group, anaphilaxy) and other factors. Because of reasons, stipulating it, a shock divide on traumatic (postwound, postburn, postoperative, after an electrotrauma etc.), hemorragic (at massive bleeding and large blood loss), cardiogenic, posttransfusion, anaphilactic, infectious-toxic and dehydration, or water-electrolitedeficiency.

On the gear of origin distinguish the following kinds of a shock: hypovolemic, or oligovolemic, stipulated by primary decreasing of volume of circulatting blood or plasma (traumatic, hemorragic, dehydration), and normvolemic, not connected with primary decreasing of volume of blood. To normvolemic a shock concern cardiogenic (connected with primary weakness of heart — infarct of the myocardium, operation on heart, tromboembolism of lung artery etc.) and vasogenic (posttransfusion, anaphilactic, infectious-toxic).

In stage of a developed shock at all patients is observed hypovolemia owing to secvestration of significant quantity of blood in microcirculating channel, and transition of fluid from blood in extravessel space (edema of tissues). Therefore main patophisiologic basis of any shock make decreasing of volume of circulatting blood (VCB) and disturbance of tissue blood supply. A corollary of these changes are hypoxia of tissues and metabolic acidosis. It is possible to schematically present diverse functional changes, explicatings at a shock, as interconnected and sequentially of upcoming phases: nervous, vessel and metabolic.

The nervous phase is stipulated by an irritation of a nervous system. It "starts" a circuit of responses, is characterized by energization of sympathoadrenal system and let in blood huge quantity of adrenaline and noradrenaline.

Vessel phase first of all is exhibited by vasoconstriction of a microcirculating channel (arteriols, capillary tubes, venules of a skin, muscles, organs of abdominal cavity), opening of arteriolo-venuos shunts, extension of capillary tubes in connection with increase of acidosis and paralysis of precapillar sphincters,

sequestration of blood in microcircular pool and intravessel coagulation, and also centralization of blood circulation.
In a metabolic phase the methabolism of substances is upset owing to hypoxia of tissues presenting to metabolic acidosis.
As at a shock more marked indications of insufficiency of blood circulation, it frequently identify with acute cardiovascular (circulating) insufficiency. Under traumatic shock understand response of an organism to a trauma expressed in acute drop of functions of vitally - important systems. For an evaluation of condition of patient at heavy trauma at once it is necessary to find out the following:
1. Capability of contact with the patient is answers to problems, fulfilment of the elementary operations: to open and to close eyes to raise limbs, to open mouth, to turn a head. Presence of stupor, somnolence.
2. Permeability of respiratory tract : tonque retraction, aspiration of blood, vomitive masses.
3. Condition of breathing: presence of breathing, it's frequency, depth, rhythm.
4. Condition of cardio-vascular system- frequency, rhythm, pressure and filling of pulse, level of arterial pressure.
5. Presence of eye symptoms: active motions of eye apples, spontaneous motions of eye apples ("floating look"); presence of corneal reflex, mydriatic pupils, anisocoria, absence of a reaction of pupils on light.
6. Presence of bleeding, leak of sanious fluid from and nose, ears.
7. Tone of muscles. At and tone comparison of muscles from two legs determine low blood pressure or мышечную high blood pressure.
As CNS, system of breathing and blood circulation tightly are connected among themselves, the condition should be estimated them in a complex and to eliminate disorders simultaneously.

Evaluation of a function of a central nervous system. The main reasons of disturbance of a CNS function at trauma are trauma of brain, disorder of blood circulation, breathin, bleeding and loss of blood. At examination takes into account three groups of symptoms describing condition of function of CNS: consciousness, reaction of pupils and safety of reflexes, adequacy of behaviour.

The disturbance of consciousness can be of easy, mean and heavy degree. At easy degree of disturbance (stupor) the patient is disoriented in time, place, put on the brakes, sleepy, confused answers problems, on a command opens eyes, shows the tonque and т. Item. A reaction of pupils on light, the reflexes are saved.
At mean degree of disturbance of consciousness (sopor) the patient fails to be woken. Any commands does not be executed, but reacts on pain and irritation (injection, nip), protective motions. Assignment of a hand, turn of a head (protective reflex). The pupils of normal size or are midriatic, response on light good and little.

A heavy degree of depressing of consciousness. Coma. The contact to the patient is impossible, to a hail does not react, it fails to be woken, protective reflexes on pain and irritation are negative, ciliary, corneal reflexes negative. The pupils moderately are extended, response on light flasque. The weakening of response of pupils on light speaks about recess of degree of depressing of nervous system. The depressing of consciousness always is accompanied by disorder of function of breathing and blood circulation: tachypnoe, tachycardia, weak frequent pulse.
The condition of pupils is the important indication of continued depressing of functions of central nervous system. The mydriatic pupils with absence of their reaction on light at stop of breathing and blood circulation indicates death. Anisocoria at craniocerebral trauma testifies, as a rule damage of hemispheres or effusion of blood in brain to compression of brain.
Disorders of breathing. At determination of disorder of breathing at heavy traumatic damages are guided by such symptoms, as:
cyanosis of skin and mucous; presence of respiratory motions of chest;
frequency and depth of breathing;
rhythm of respiratory motions; breast participation of auxiliary muscles and neck in breathing;
exotic excursions of chest at breathing (paradoxical breathing);
tachycardia.
The reasons of disorders of breathing at trauma are:
pain stipulated by trauma of chest (a contusion, squeezing, fracture of ribs, rupture of the diaphragm);
decreasing of respiratory surface of lungs at compression of lungs at pneumothorax, hemothorax;
obturation of respiratory paths by blood, mucus, vomitive masses;
closing of an entrance in larynx by tonque retraction in unconscious condition of the patient;
massive bleeding with development of "shock" lung;
stop of breathing at trauma of brain and damage of respiratory centre;
disturbance of a mechanics of breathing at a double multiple fractures of ribs.

At examination of the patient with heavy trauma determines in the urgent order presence of indications of disorders of breathing. A stop of breathing (apnae), cyanosys of interchange of gases skin speaks about heavy disturbance (hypoxia); the hurried shallow breathing speaks about disorder of breathing stipulated by pain (a fracture of ribs, contusion of chest wall), and conducts to decreasing of ventilating capacity of lungs, hypercapnia and hypoxia. At bleeding the breathing becomes steep and hurried owing to and drop VCB, pulmonary blood flow. At partial closing of respiratory paths breathing стридорозное, with a noisy exhalation; at full obstruction of respiratory paths the stop of breathing comes, fast develops total cyanosis with consequent stop of blood circulation.

If at examination of the patient observed the exotic respiratory motions of chest wall - part of chest sinks down at an inhalation and bulges at an exhalation, sternocleidomastoid, large pectoral, scalene muscles are sharply intense at an inhalation- it is a syndrome of paradoxical breathing stipulated by disturbance of mechanical stability of chest wall at a double multiple fracture of ribs. The expressed load at a system of respiratory muscles results in fast their exhaustion and development of acute respiratory insufficiency.

The condition of a function of organs of breathing can be estimated with the help of auscultation and percussion of a chest wall. Bandbox sound with absence of respiratory noise above a half of chest indicates pneumothorax, shortening of percussion sound and absence of respiratory noise indicates hemothorax.

If on clinical indications (the shallow hurried breathing,cyanosys, tachycardia) is installed acute respiratory insufficiency, follows at once to determine and to remove the it's reason.

Determination of condition of blood circulation. The reasons of disorder of blood circulation at traumatic damages are pain, traumatic shock, bleeding and loss of blood, hemorrhagic shock. The evaluation of degree of disturbance of blood circulation at primary examination of patient with trauma is carried out on condition of skin, pulse (frequency, filling, pressure), level of arterial blood pressure, condition of peripheral blood circulation (pallor, cyanosys of skin).

If at examination of the patient with a heavy trauma are determined pallor of skin, cyanosys of lips, tip of nose, ear bowls, fingers of hands and legs, hypothermia of limbs, cold sticky sweat, quick pulse of weak filling, drop of ABP, it testifies to serious disorder of blood circulation. The stronger transferred symptoms are expressed, the more degree of disorder of blood circulation. For determination of a condition of blood circulation in hospital carryed out taking of central venous pressure, volume of circulatting blood, hemoglobin level, hematocrite, diuresis.

The reason of a shock is a pain more often called by heavy damage and blood loss.

Assume to a shock: overfatigue, general exhaustion, feeling of fear etc.

On clinical current traumatic shock divide into two phases — erectile and torpide. Erectile phase is observed rarely (at 5 — 10 % of the patients with a shock). It is short and fast passes in torpide phase. More often erectile phase of a shock is marked at burns. It's characteristics are sharp energization (propulsion and emotional), increase of palpitation and breathing, increase of ABP, hyperemia and cyanosis of a face, quite often — disturbances of consciousness.

Main symptoms of torpide phase are: stupor of the patient, though the consciousness is more often saved, grayish or marble colouring of skin, cold sticky sweat on a face, thready pulse, surface breathing, low ABP, decreasing of diuresis up to anuria.

Main parameters of degree of a shock serve frequency of pulse, level of ABP and CVP. Distinguish 4 degrees of shock: easy, mean, or compensated, heavy, or decompensated, and agony.
At a easy degree ABP is not lower than 100 mm Hg. , pulse — 100 per 1 min, CVP normal (4 — 8 sm of water). At a mean degree the pulse changes within the limits of 100 — 120 per 1 min, ABP — 90 — 80 mm Hg ; at a heavy degree — accordingly 140 — 160 per 1 min and 70 mm Hg is lower 80 ; CVP is reduced up to 0 — 2 sm of water. At agony pulse on peripheral arteries and ABP are not determined, CVP is equal 0.
For an evaluation of degree of a shock use a so-called shock index Allgower — Burry, based on a ratio of frequency of pulse and systolic ABP. In the norm it is equal 0,5 (pulse 60 per 1 min, ABP - 120 mm Hg). At the compensated shock the index is equal 1, at decompensated — 1,5 and more. Degree of a shock is determined also of hourly diuresis. At an easy degree of a shock diuresis is descended up to 40 ml/h, at compensated — up to 30 — 20 ml/h, at decompensated — up to 0.
The therapy of a shock, in particular traumatic, begins on a stage before hospitalisation. Install character and localization of damage, execute first aid (immobilisation of a limb, superposition of dressing, Esmarch's turniqet, recovery of permeability of respiratory paths; cardiopulmonary reanimation, intravenous introduction analgetic and antishock drugs — at a heavy shock). During transporting of patient in surgical hospital- intravenous transfusion of fluid.
The quantity of entered fluids is inspected by a level CVP, ABP, frequency of pulse, hourly diuresis and condition of peripheral blood circulation (change of colouring of a skin, condition of veins). Total volume on the average makes them at an easy degree of a shock 2 l, at heavy — 3 — 6 l in 24 hours.
The collapse — acute circulating insufficiency distinguished from a shock only that develops owing to primary weakness of cardiovascular system, in particular fallings of vascular tension on a background of increase of activity of a parasympatic nervous system (vagus). Clinics of shock and collapse are similar among themselves. The difference consists only that at a collapse the patient always loses consciousness. In the foreign literature of concept "shock" and " collapse" frequently do not differentiate. Usually collapse complicates current of various infectious diseases and frequently is observed at convalescens. Principles of diagnostics and treatment at a collapse practically same, as at a shock: a fulfilment of VCB, introduction of cordial means, oxygenotherapy and the introduction of catecholamines — noradrinalin or phenylephrine hydrochloride.
Syncope — generalized or diffuse hypovolemia of a brain connected to sudden acute redistribution of blood in a body (by outflow it from brain in trunk, especially abdominal cavity). Clinically is exhibited by short-term loss of consciousness, pallor of a skin, dizziness, sharp weakness, sweating, sometimes by nausea. This promote sharp stand up, famine, cahexia, low vascular tension,

neurocirculatory distonia etc. The patient needs to be laid, by supplying an easy approach of a fresh air to liberate from constraining clothes, for energization of respiratory centre to give him to smell moistened by a solution of ammonia a wadded ball.
Closed injures – injures of tissues and organs without damages of skin.
Contusion of soft tissues - a closed ingury with destruction of underskin-fat with it's lymphatic and blood vessels of small calibre and nerves. Distension – it is tension of tissues, called by their hyperdistension, accompanyed with preservation of anatomic structure. If takes place disturbance of anatomic structure of tissues it is rupture.
Contusion usually results from a falling or impact, marked obtuse subject possessing a small kinetic energy (a stone, details of a product, tool). Contusions of soft tissues can be independent damage or are observed simultaneously at fractures, marked obtuse subject; contused wounds. Meet outside (surface) contusions of a limbs and more often head, it can be accompanied by a contusions and other damages (concussion, gap) of internal organs of chest, abdomen, head brain. Clinical indications of a contusion are a pain, edema, hemorrhage, disturbance of a function.
The pain — first symptom of a contusion — occurs at once at the moment of a trauma and it happens significant. Especially strong pain happens at contusions of periosteum. Then the pain a little decreases or has moderate character, and after 1 — 3 h after a trauma is renewed or considerably amplifies. Change of character of pain, increase of its intensity are stipulated by amplification of traumatic edema, hemorrhage (impregnation of tissuess by blood), increase of hematoma.
At a contusion of a limb motions in joints in the beginning are saved, and in accordance with increase of hemorrhage and edema they become impossible, especially at hemarthrosis. By such disorder of a function the contusion differs from fractures and dislocations, at which the active and passive motions become impossible at once after trauma.
Swelling in the field of a contusion occurs fast. At inspection it has a kind of painful condensation, which without the precise boundaries passes in healthy tissues. Greatest pain at palpation is marked at a contusion of periosteum, formation of underperiosteum hematoma. Swelling, as a rule, accrues at the first hours or day after a trauma, that is stipulated by development of traumatic edema and inflammatory changes.
The development of a bruise is characteristic of contusion, that is stipulated by impregnation of a skin and underskin fat by the given vent blood. The time of appearance of a bruise depends on depth of hamorrhage. At contusion of a skin and underskin fat it occurs at first minutes or hours. At contusion of muscles, bruise there is on 2 — 3-rd day and sometimes far from a place of a contusion. The appearance of late bruises, especially far from a place of a contusion, is a serious symptom and requires additional research, for example X-ray — for an

elemination of a fracture or crack of a bone. As an example it is possible to result a symptom of glasses — bruises in area of orbits, which occur in some hours or even for the second day after a contusion of a head. Appearance of this symptom is an indication of a trauma of a skull — fracture of its basis.
The colour of a bruise is subjected to certain changes owing to disintegration of hemoglobine. Fresh bruise of red colour, through 5 — 6 days it becomes green, and then — yellow. On colour of a bruise it is possible to judge prescription of a trauma.
At rendering assistance on a place of contusion of a limb superimposes pressing bandage. Within the first day for decreasing of hemorrhage to a place of a contusion applies a packet with ice, through each 2 h. makes interraptions on 30 — 40 min. At contusion of a limb accompanied by haemarthrosis, the it's necessary to created it's rest — raised position; to impose pressing bandage on a joint. From 2 — 3-rd day for acceleration of resorption apply thermal procedures . Large haematomas are punctured through 5 — 7 days, removes blood and superimposes pressing bandage.
At examination of the patient with contusion of a limb it is necessary to determine puls on peripheral arteries to compare temperature of skin of both limbs, to investigate sensitivity on peripheral segments, as the contusions can be accompanied by injury or compression by haematoma of vascular-nerves fascicles. At suspicion of possible damage of bone it is necessary to perform X-ray research.
The ruptura of muscles is observed at excessive their distension. Most frequently are damaged biceps muscle of shoulder, quadriceps muscle of thigh and gastrocnemicus muscle. A clinical picture is rather precise: in a moment of a ruptura the patient feels a strong pain (as impact by an electricity), the function of a muscle is completely eliminated. On a place of a ruptura are determined a cavity and hematoma.
At an incomplete ruptura of muscle a limb is immobilised by plaster bandage, by giving a muscle a position of full relaxation: at a ruptura of biceps muscle the upper limb is immobilised in aposition of an inflection in elbow joint under a right angle, at a ruptura of quadriceps muscle of thigh on the lower limb superimpose bandage in a straightened position, at ruptura of gastrocnemicus muscle the leg is bent in a knee joint. Immobilization proceeds 2 - 3 weeks, then apply massage, medical physical culture.
At a full ruptura of muscles treatment only operative. Stitching of muscle with immobilization of a limb after operation on 2 - 3 weeks.
The ruptures of sinews are accompanied by pain and disturbance of a function of a joint. More often there are ruptures of sinews of a hand and fingers, Achilles tendon, sinew of the long head of biceps. At a ruptura of sinews the patients marks a pain, the function of a joint (inflection or unbending is upset depending on a

damaged sinew). At examination are determined swelling, sickliness in a place of a ruptura.

Treatment operative-stitching of a sinew.

A **fracture** is defined as a disruption in the integrity of a living bone, involving injury to the bone marrow, periosteum, and adjacent soft tissues. Many types of fractures exist, such as pathologic, stress, and greenstick fractures.

Fractures occur when the force applied to a bone exceeds the strength of the involved bone. Both intrinsic and extrinsic factors are important with respect to fractures. Extrinsic factors include the rate at which the bone's mechanical load is imposed and the duration, direction, and magnitude of the forces acting on the bone. Intrinsic factors include the involved bone's energy-absorbing capacity, modulus of elasticity, fatigue, strength, and density.

Bones can fracture as a result of direct or indirect trauma. Direct trauma consists of direct force applied to the bone; direct mechanisms include tapping fractures (eg, bumper injury), penetrating fractures (eg, gunshot wound), and crush fractures. Indirect trauma involves forces acting at a distance from the fracture site such as tension (traction), compressive, and rotational forces.

The 5 phases of fracture healing are the following:

1. Fracture and inflammatory phase
2. Granulation tissue formation
3. Callus formation
4. Lamellar bone deposition
5. Remodeling

Actual fracture injuries to the bone include insult to the bone marrow, periosteum, and local soft tissues. The most important stage in fracture healing is the inflammatory phase and subsequent hematoma formation. It is during this stage that the cellular signaling mechanisms work via chemotaxis and an inflammatory mechanism to attract the cells necessary to initiate the healing response. Within 7 days, the body forms granulation tissue between the fracture fragments. Various biochemical signaling substances are involved in the formation of the granulation tissue stage, which lasts roughly 2 weeks.

During callus formation, cell proliferation and differentiation begin to produce osteoblasts and chondroblasts in the granulation tissue. The osteoblasts and chondroblasts, respectively, synthesize the extracellular organic matrices of woven bone and cartilage, and then the newly formed bone is mineralized. This stage requires 4-16 weeks.

During the fourth stage, the meshlike callus of woven bone is replaced by lamellar bone, which is organized parallel to the axis of the bone. The final stage involves

remodeling of the bone at the site of the healing fracture by various cellular types such as osteoclasts. The final 2 stages require 1-4 years.
Patient factors that influence fracture healing include age, comorbidities, medication use, social factors, and nutrition. Other factors that affect fracture healing include the type of fracture, degree of trauma, systemic and local disease, and infection.Patients who have poor prognostic factors in terms of fracture healing are at increased risk for complications of fracture healing such as nonunion (a fracture with no possible chance of healing), malunion (healing of bone in an unacceptable position in any plane), osteomyelitis, and chronic pain.

Classification

Types of Bone Fractures

Fractures are classified as closed or open (compound) and simple or multi-fragmentary (formerly comminuted).

- Closed fractures are those in which the skin is intact, while open (compound) fractures involve wounds that communicate with the fracture and may expose bone to contamination. Open injuries carry an elevated risk of infection; they require antibiotic treatment and usually urgent surgical treatment (debridement). This involves removal of all dirt, contamination, and dead tissue.
- Simple fractures are fractures that occur along one line, splitting the bone into two pieces, while multi-fragmentary fractures involve the bone splitting into multiple pieces. A simple, closed fracture is much easier to treat and has a much better prognosis than an open, contaminated fracture. Other considerations in fracture care are displacement (fracture gap) and angulation. If angulation or displacement is large, reduction (manipulation) of the bone may be required and, in adults, frequently requires surgical care. These injuries may take longer to heal than injuries without displacement or angulation. Lactate dehydrogenase levels increase when the bone breaks.

Another type of bone fracture is a compression fracture. An example of a compression fracture is when the front portion of a vertebra in the spine collapses due to osteoporosis, a medical condition which causes bones to become brittle and susceptible to fracture (with or without trauma).
Other types of fracture are:

- Complete Fracture- A fracture in which bone fragments separate completely.
- Incomplete Fracture- A fracture in which the bone fragments are still partially joined.
- Linear Fracture- A fracture that is parallel to the bone's long axis.
- Transverse Fracture- A fracture that is at a right angle to the bone's long axis.
- Oblique Fracture- A fracture that is diagonal to a bone's long axis.

- Compression Fracture-A fracture that happens only in the vertebrea.
- Spiral Fracture- A fracture where at least one part of the bone has been twisted.
- Comminuted Fracture- A fracture causing many fragments.
- Compacted Fracture- A fracture caused when bone fragments are driven into each other
- Open Fracture- A fracture when the bone breaches the skin

Joint (intraarticular). Occur within a joint; lead to a loss of motion and gradually developing osteoarthritis.
Pathologic. An underlying disorder (such as infection, a noncancerous bone tumor, cancer) weakens a bone, leading to a fracture
Stress. A bone becomes stressed repeatedly over time because of certain activities, such as walking with a heavy pack or running
Occult Fractures that are difficult or impossible for a doctor to see on an initial x-ray; may appear as dark or white lines days to weeks after injury
Greenstick. A partial crack and a bend in the bone but not a break through the bone completely; occur in children only
Growth plate. A break through part of the bone that allows bones to lengthen (growth plate); may cause a bone to stop growing or to grow crookedly; occur only in children
Displaced The broken ends of the bones are separated or bent at an angle
Nondisplaced The normal shape and alignment of a bone are maintained despite cracks completely through the bone

<u>Symptoms and Complications</u>
Pain is the most obvious symptom. Fractures hurt, especially when force is applied, such as when a person tries to put weight on an injured limb. The area around the broken bone is also tender to touch. Swelling of soft tissue around the fracture begins within a few hours. The limb may not function properly, so that moving an arm, standing on a leg, or gripping with a hand is very painful. For a person who cannot speak (for example, a very young child, a person with a head injury, or an older person with dementia), refusal to move an extremity may be the only sign of a fracture. People with pathologic fractures often experience steadily increasing pain beginning weeks before the fracture actually occurs.

Internal bleeding may occur with a closed fracture (one in which the skin is not torn). The bleeding may occur from the bone itself or from surrounding soft tissues. The blood eventually works its way to the surface, forming a bruise, which at first is purplish-black then slowly turns to green and yellow as the blood is broken down and reabsorbed back into the body. The blood can move quite a distance from the fracture, and the entire process takes a few weeks to complete.

The blood can cause temporary pain and stiffness in surrounding structures. Shoulder fractures, for instance, can bruise the entire arm and cause pain in the elbow and wrist. Some fractures, especially hip fractures, can lose quite a lot of blood into the surrounding tissues, causing low blood pressure.

The person usually feels some discomfort with activities even after fractures have healed sufficiently to allow full weight bearing. For example, although a fractured wrist may be strong enough to allow some use in about 2 months, the wrist will not have completely undergone remodeling, and it will be painful with forceful gripping for up to 1 year. The person may also notice increased pain and stiffness when the weather is damp, cold, or stormy.

Most fractures heal with few problems. However, sometimes even with proper treatment, fractures can cause serious complications.
Compartment Syndrome: Compartment syndrome is a serious limb-threatening condition caused by excessive swelling of injured muscles, which may occur as a result of a fracture or crush injury to a limb. Muscles are surrounded by a fibrous covering that forms a closed space (compartment). An injured muscle swells; when the swelling is significantly confined by the muscle's compartment, and particularly when it is further confined by a cast, the pressure within the muscle tissue may increase. This increase in pressure decreases the normal blood flow that provides oxygen to the muscle. When the muscle is deprived of oxygen for too long, further injury to the muscle occurs, which leads to further swelling and higher tissue pressures. After only a few hours, irreversible injury and death of muscle and nearby soft tissues may result.

A doctor becomes concerned about compartment syndrome when the person feels increasing pain in an immobilized limb after a fracture, pain when the fingers of an immobilized arm or toes of an immobilized leg are moved gently, or numbness in the limb. The diagnosis of compartment syndrome can be confirmed using a device that measures pressure in the muscles.

Pulmonary Embolism: Pulmonary embolism is the sudden blocking of a lung artery by an embolus, nearly always resulting from a blood clot that can travel to the lungs, especially from the deep veins of the leg. Pulmonary embolism is the most common fatal complication of serious hip and pelvic fractures. People with hip fractures are at high risk of pulmonary embolism because of the combination of trauma to the leg, forced immobilization for hours or days, and swelling around the fracture site blocking blood flow in the veins. Of people with a hip fracture who die, about one third die of pulmonary embolism. Pulmonary embolism occurs much less commonly with fractures of the lower leg and very rarely with fractures of the upper body.

Doctors may suspect pulmonary embolism based on a range of symptoms, including chest pain, cough, and shortness of breath. Confirmation may involve chest x-ray, electrocardiogram, and one or more of a variety of imaging studies.

Diagnosis

X-rays are the most important tool for diagnosing a fracture. They not only show the fracture but also help a doctor understand how the fragments of bone are misaligned. Small or nondisplaced fractures can be difficult to see on routine x-rays, and sometimes additional x-rays are taken at special angles. Occult or stress fractures may take days or weeks to show clearly on x-rays. Pathologic fractures are diagnosed by x-rays that show bone abnormalities, such as punched-out (lytic) areas caused by infection, benign tumors, or cancer.

Computed tomography (CT) and magnetic resonance imaging (MRI) can show features not seen on routine x-rays. CT can show the fine details of a fractured joint surface or can reveal areas of a fracture hidden by overlying bone. MRI shows the soft tissue around the bone, which helps to detect injury to nearby tendons and ligaments, and can show evidence of cancer. MRI also shows injury (swelling or bruising) within the bone and can thus reveal occult fractures before they appear on x-rays.

Bone scanning is an imaging procedure that involves use of a radioactive substance (technetium-99m-labeled pyrophosphate) that is taken up by any healing bone. Occult fractures can be detected on bone scans 3 to 5 days after the injury. If a pathologic fracture is suspected, bone scans help to check for problems in other bones—ones that might not yet be producing symptoms.

Treatment

Fractures require immediate attention because they cause pain and loss of function for the person. After initial emergency care, fractures usually require further treatment, including immobilization with casts or traction, or fixation with surgery.

Fractures in children are often treated differently than those in adults because bones in children are smaller, more flexible and less brittle, and most importantly, still growing. Treatment with casts or traction is often preferred over surgery to avoid damage to the growth plate.

Initial Treatment: When a fracture is suspected, the person should call his or her doctor, who will determine the appropriate facility for treatment. The choice of a facility depends on the severity of the injury. For example, people with minor wrist and shoulder fractures can be treated in medical offices. Because people with hip

fractures are in severe pain and are unable to move, they must be transported by ambulance to a hospital with surgical facilities.

Open fractures need to be treated immediately with surgery to carefully clean and close the wound. Massive open fractures with great losses of the skin, muscle, and blood supply to the bone are the most serious and difficult to treat.

For most closed fractures, treatment with casts or surgery can be delayed up to 1 week without affecting the long-term result. However, there is usually no advantage to waiting, because until they are treated, people are troubled by pain and loss of function. Before seeing a doctor, the person should immobilize and support the injured limb with a makeshift splint, sling, or a pillow; elevate the limb to the level of the heart to limit swelling; apply ice to control pain and swelling; and take only acetaminophento relieve pain. Aspirin and other nonsteroidal anti-inflammatory drugs (NSAIDs) should not be taken because they may worsen bleeding.

The doctor may recommend the person continue to keep an injured arm or leg elevated to control swelling. For arm fractures, pillows are used for elevation. For leg fractures, the person should periodically lie flat with the leg on a pillow. The doctor compares the swelling of the injured limb with the normal appearance of the uninjured limb to help determine how long or often elevation is needed. During the later stages of healing, elastic stockings may be used during the daytime to help control swelling when the person is sitting or standing.

Immobilization: Most fractures can be treated without surgery. They are immobilized with a splint, sling, or cast until they heal sufficiently. Displaced fractures must be aligned (by a procedure called reduction) before being immobilized. When minor fractures (such as those of the fingers or wrist) are aligned, the person may need an injection of a local anesthetic, such as lidocaine, to prevent pain. When major fractures of the arm, shoulder, or lower leg are aligned, the person may need general or spinal anesthesia; this procedure is called closed reduction.

A splint is a long, narrow slab of plaster or fiberglass applied with elastic wrap or tape. The slab does not completely encircle the limb, which allows for some expansion due to tissue swelling. For this reason, splints are often used for initial treatment of fractures. For finger fractures, aluminum splints covered with foam are commonly used.

A sling by itself provides sufficient support for many shoulder and elbow fractures. The weight of the arm pulling downward helps to keep many shoulder fractures

well aligned. A strap passing around behind the back can be added to keep the arm from swinging outward, especially at night. Slings permit some use of the hand.

A cast is made by wrapping rolls of plaster or fiberglass strips that harden once wetted. Plaster is often chosen for the initial cast when a displaced fracture is being treated. It molds well and has less of a tendency to cause painful contact points between the body and cast. Otherwise, fiberglass has the advantage of being stronger, lighter, and more durable. In either case, the cast is lined with soft cottony material to protect the skin from pressure and rubbing. If the cast becomes wet, it is often impossible to completely dry the lining; this can lead to skin softening and breakdown (maceration). For partially healed fractures, a special, more expensive and less protective waterproof lining is sometimes substituted.

After a cast is applied (especially for the first 24 to 48 hours), it should be kept elevated when possible to the level of the heart to combat swelling. Regular flexion and extension of the fingers or wiggling of the toes helps the blood to drain from the limb and also helps to prevent swelling. Pain, pressure, or numbness that remains constant or worsens over time should be reported to a doctor immediately. These conditions may be due to a developing bedsore or compartment syndrome.

Traction: Traction is sometimes used to keep the bones aligned while a fracture heals. An array of ropes, pulleys, and weights are used to continuously pull on the limb. In adults, traction is used only until the fracture can be safely treated with a cast or surgery. In children, certain fractures are best treated with traction because the healing time is shorter than in adults. Also, traction does not injure the growth plate, whereas surgery may do so.

Surgical Treatment: Fractures sometimes require surgical treatment. For instance, the doctor must explore and carefully clean open fractures to ensure that no foreign material has contaminated the bone ends. When a bone fragment or a tendon is trapped in the bone ends, a doctor may not be able to align a displaced fracture and surgery is needed. Comminuted fractures are often too unstable for a cast to maintain alignment against the forces of muscle contraction, which can cause the bone to shorten or angle. Joint fractures require a near-perfect alignment of the joint surfaces or the person will later develop arthritis. If possible, pathologic fractures are stabilized surgically before they break through completely. This approach avoids the pain, disability, and the more complex surgery involved with a displaced fracture. Finally, if fractures of the femur (thighbone), which includes most hip fractures, are not treated surgically, they would require months of immobilization in bed before the person is strong enough to bear weight. In contrast, surgical stabilization usually permits the person to walk with crutches or a walker within days.

Surgical stabilization involves first accurately reducing the fracture to restore the bone's original shape and length. The surgeon uses anesthesia to relax the muscles and x-ray equipment to help align the bones. A surgeon exposes the fracture to see and manipulate the fragments with special instruments. Then, the bone fragments are securely fixed using some combination of metal wires, pins, screws, rods, and plates. Metal plates are contoured and fixed to the outside of the bone with screws. Metal rods are inserted from one end of the bone into the marrow cavity. These implants are made of stainless steel, high-strength alloy metal, or titanium. All such implants made in the last 15 years are compatible with the strong magnets that are used for magnetic resonance imaging (MRI). Most will not set off security devices at airports.

A joint replacement procedure (arthroplasty) may need to be performed when fractures severely damage the upper end of the femur (thighbone) or humerus (armbone) that form the outer half of the hip and shoulder joints.

Bone grafting may be used to assist healing of fractures initially, if the gap between fragments is too large, or later, if the healing process has slowed (delayed union) or stopped (nonunion).

Treatment of Complications: For compartment syndrome, initial treatment consists of immediately removing or loosening anything that may be confining the limb, such as a splint or a cast. When the muscle compartment continues to cause increased pressure, an emergency surgery called fasciotomy must be performed to open this constricting tissue. Otherwise, the muscles and nerves could die because of a lack of oxygen. If this occurs, it may be necessary to amputate the limb.

Pulmonary embolism can be prevented with drugs such as heparin, low-molecular-weight heparin, warfarin, and fondaparinux (a new drug similar to heparin). These drugs reduce the tendency of the blood to clot, and are given to people with fractures that put them at risk of forming a pulmonary embolism. If an embolus occurs, emergency treatment is needed.
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Joint dislocation occurs when bones in a joint become displaced or misaligned. It is often caused by a sudden impact to the joint. The ligaments always become damaged as a result of a dislocation.Once a joint is dislocated, it may reduce (return to its proper position) on its own, or it may require physical manipulation. Such manipulation, if improperly attempted, can greatly increase the severity of the injury. However delay in treatment of a dislocation can affect blood supply, ligaments, bone and joint structures, sometimes resulting in permanent disability.

As with most medical conditions, expert help should be sought as soon as possible. Once reduction is achieved, the joint may be held in place through a splint (for straight joints like fingers and toes) or a bandage (for complex joints like shoulders). Shoulder injuries can be surgically stabilized, for example using arthroscopic surgery. Dislocations often require immediate medical attention. After a dislocation caution should be exercised and the joint structures stabilized and muscles strengthened. This will help reduce the chances of repetition.
The shoulders, fingers, and wrists are all common places for a dislocation to occur. Having a dislocation increases the risk of a re-occurrence. Constant dislocations can be treated via surgery or strengthening the structures surrounding the dislocated area, normally through exercise.
A subluxation is a partial dislocation.
Classification: Dislocations are classified as follows:
Congential
Traumatic
Pathological
Paralytic
Congential dislocation are dealt with in congential deformities
Traumatic dislocation
This usually follows a serious violence. The following are the clinical types of dislocation.
Acute dislocation
Old unreduceddislocation
Recurrent dislocation

Acute dislocation
The traumatic dislocation commonly occur in the shoulder, elbow and hip. The acute dislocation are further classified according to the direction of dislocation of the distal bone in relation to the proximal e.g. Anterior, posterior etc. Clinically the acute traumatic dislocation is diagnosed by the history and the findings. There is acute pain and swelling around the joint. There is gross deformity at the joint, and the bony landmarks are distorted. The clinical sings common to all dislocation fall into 2 groups.
1. The sings denoting the absence of the articular end of a bone from its normal anatomical
position.
2. Sings denoting the presence of the displaced end of the bone in an abnormal position.
One should look for associated nerve and vascular injuries. Radiographs confirm the
diagnosis and detect associated fractures.

Management: Acute dislocation of a joint is an orthopaedic emergency and it requires immediate reduction under anaesthesia. After reduction the part should be immobilised till the soft tissues like the capsule and ligaments heal. After about 3-4 weeks the joint is mobilised by exercise therapy.

Old unreduced dislocation

Patients with unreduced dislocation present themselves for treatment weeks to months after the primary dislocation. This is unfortunately common in India due to unsuccessful treatment by indigenous practitioners carried out in rural areas. These are difficult problems and need prolonged treatment

Treatment: Closed reduction under anaesthesia is attempted in cases presenting within four weeks. This should not be done in dislocations more than six to eight weeks old as there is danger of fracture during the manipulation. Surgical reduction is indicated in such cases.

Recurrennt Dislocation

When a traumatic dislocation of a joint is followed by subsequent frequent dislocations by minimal trauma, it is called recurrent dislocation. This is particularly common in the shoulder joint and patello femoral joint.

Pathological dislocation

This is caused by some disease process and is common in the hip joint. This occur when there is destruction of the head of the femur or excessive distention of the joint capsule.

Destructive Dislocation

This is common in the following condition: (I) Tuberculosis of the hip when there is a travelling acetabulum, (ii) Septic arthritis of the hip of infancy where there is total destruction of the head of femur.

Distensive Dislocation

The head of the femur gets dislocated when the joint capsule is rapidly distended by an effusion of synovial fluid or pus.

Paralytic dislocation

This occurs when there is marked imabalance of muscle power. It can occur in the hip whenever there is an overaction of the hip flexors and adductors, in certain paralytic conditions. This is always a posterior dislocation. In poliomyelitis, when the hip extensors and abductors are paralysed, the normal adductors and flexors overact and cause dislocation. In cerebral palsy, the spasm of the adductors and flexors cause the dislocation.

V. Materials of activation of students

(questions, tasks, controversial situations, illustrative materials and other).

VI. Materials of selftraining of students on the topic of lecture: literature, questions, tasks.

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