

З ДОСВІДУ ВИЩОЇ ШКОЛИ

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METHODICAL INSTRUCTIONS OF PRACTICAL EMPLOYMENT ON A THEME: “DEGENERATIVE-DYSTROPHIC DISEASES OF JOINTS”

Actually of theme: Degenerative-dystrophic defeats of large joints – widespread disease of locomotor apparatus, that results in the protracted loss of capacity, and in the row of cases by the reason of disability of patients. The Degenerative-dystrophic diseases strike people in age most capable of working, a tendency to the permanent disability and progress, make near 3 % of all orthopaedic patients. Knowledge of clinical, roentgenologic diagnostics, principles of conservative and operative medical treatment and prophylaxis of degenerative – dystrophic defeats of joints is the primary purpose of study of one of widespread orthopaedic diseases.

Before that how to pass to preparation of practical employment familiarize with his purpose.

General purpose: to be able to identify independently clinical and roentgenological expose the degenerative-dystrophic defeats of large joints, to find out the reason of the given pathology, to draw up a plan of the proper medical treatment taking into account the form of stage of process, age, profession, places of residence, concomitant diseases, to set a medical and labor prognosis.

The educational purposes

A=1 (The first level of mastering)

To know: classification of degenerative – dystrophic diseases of joints. Etiopatogenesis of oseoarthrosis (OA, deformities arthrosis), aseptic necrosis (AN), epiphysial area cysts (EAC). To familiarize with a clinical and radiological features at degenerative – dystrophic diseases of joints. To know about principles of modern diagnostics, treatment.

A=2 (The second level of mastering)

To know clinical and radiological features degenerative – dystrophic diseases of joints. Know theories of etiology and patogenesis, pathophysiology of degenerative – dystrophic diseases of joints. To know

diagnostic criteria, accurate diagnostic laboratory investigations for degenerative – dystrophic diseases of joints. Clinical, roentgenological, pathomorphological classification of OA and AN by E.T. Scljarenko, Kellgrane&Lawrence, Outerbridge. To master methods of conservative treatment. To draw up a plan of medical treatment in dependence on a stage, to define indications and ways of surgical treatment of these diseases. Complications.

A=3 (The third level of mastering)

To be able to carry out the differential diagnosis of degenerative – dystrophic diseases. To be able to interpret roentgenograms in various stages degenerative – dystrophic diseases. To choose tactics treatment which depending on age patients, stages diseases. To know classes of drugs, mechanism of action of NSAID and chondromodifying drags (ChMD). Role of local corticosteroid treatment. To define indications and principle of surgical procedures in degenerative – dystrophic diseases in various age groups.

A=4 (The fourth level of mastering)

On the basis of a clinical material and use of sources of the basic and additional literature to know pathological change are observed in degenerative – dystrophic diseases and the severity varies according to the stages of the disease. To know substantiation of clinical signs, the radiographic or MRI features degenerative – dystrophic diseases. Differential diagnosis of degenerative – dystrophic diseases. To know classes of drugs and mechanism of action. Practical prescribing of NSAID and ChMD. Commonly prescribed drugs. To know treatment regimen, performing monitoring treatment in various age groups. Causes of early and long-term complications of diseases and treatment. To know the method of their prophylaxis and medical treatment. Principle of modern surgical procedures in arthrology.

Interdisciplinary integration:

Subject (discipline)	To know	To be able
1) Preliminary (normal anatomy, operative anatomy, topographical anatomy, histology, clinical biochemistry, pharmacology, patophysiology, radiology, neurology).	Anatomical constitution of the hip, knee, ankle, shoulder, elbow, wrist joints. Periods of normal development of joints. Structures of the joints, a place an attachment ligaments, their role. Muscles, their function and a role. Muscle forces acting across the joints. Anatomy-topographical features of region around joints. A substantiation rational operative procedures (access). Features of blood, nerves supply. The most diagnostic tool for degenerative – dystrophic diseases. Three classes of drugs are used regularly. Mechanism of action. Commonly prescribed drugs. <ul style="list-style-type: none"> • Analgesics • Anti-inflammatory drugs • Chondromodifying drugs. Reparative regeneration of chondral, bone and soft tissues around the joints and in the joints.	To defined radiographic or features abnormal joints (signs of arthrosis). Roentgenologic anatomy of the hip, knee, ankle, shoulder, elbow, wrist joints Joint aspirate. Steroids intra-articular damages. Identification of the causative factors. Results of laboratory investigations: parameters of blood, urine. Microscopy: the synovial fluid is tested for cells, sugars and proteins. Culture of the synovial fluid or of synovial tissue for diagnostic Arthroscopic criteria.
The following(which provided)	Resort medical treatment, electrotherapy. Mechanism of action Preventive of possible complications of arthrosis and ways of their prevention. Terms immobilization joints in various age groups of joints.	Immobilisation of the joints in functional position and medical physical education Muscle setting exercises To defined symptoms of degenerative – dystrophic diseases
Intrasubject integration (themes of the given discipline with which it is integrated).	1) Indication and methods of conservative medical treatment. 2) Indication and choice of methods surgical treatment	1) To measure of active and passive motions in the joints. 2) To measure of the lengths of upper and lower limbs, cause of changes. 3) To carry out medical physical education of joints.

The plan and organizational structure of employment.

Basic stages of employment and their functions	Educational purposes in levels of mastering (memorizing)	Quality monitoring and training	Materials of methodical support (maintenance)	Hour, minute
1. Preparatory stage				
1. Organization of employment	The teaching and educational purposes of employment before group of students are established	Opening speech of the teacher	Methodical instruction Test tasks	2-3
2. Definition of the educational purposes and motivation				3-5
3. The control of an initial level of knowledge, skills		The written control, express-questioning.		10

2. Basic stage					
<p>Forming of professional abilities and skills. To seize knowledge of diagnostic algorithm of degenerative – dystrophic diseases To receive skill of conducting of orthopaedic inspection of patients with degenerative – dystrophic diseases Clinical: symptoms of degenerative – dystrophic diseases. Laboratory investigations. To know indications and ways of conservative and operative treatment of these diseases, complication: a) To pay attention to the theories of etiology, pathophysiology of degenerative – dystrophic diseases. b) To be able to measure relative and anatomic length of a segments c) To be able to interpret roentgenograms of the joints in adolescents and adult. d) Formations of the diagnosis. e) Treatment: substantiation of methods of treatment, the indication and ways of surgical treatment, principles of rehabilitation.</p>		<p>Inspection of patients, theoretical interviews. Studying of roentgenograms in an educational room. Discussion</p>	<p>Thematical patients, reference cards. Roentgenograms, tables, pictures, structural-logical charts, video materials. Educational rooms, structural departments, clinics.</p>	30	
					20
					30
3. Final stage					
<p>5. For examination on an investigated theme it is recommended to solve situational tasks 6. Summarizing (theoretical, practical, organizational estimation) 7. Task home work</p>		<p>Thematic situational tasks, independent work, discussion. Individual analysis of control practical skills. Concluding remarks of the teacher</p>	<p>Educational room</p>	20	
			<p>Educational room Results of inspection reports, protocols, reference card for independent work with literature Recommended literature</p>	10	

Knowledge of basis of clinical, laboratory, morphological and roentgenological signs of osteoarthritis, differential diagnostics, prophylaxis, principles of medical treatment has the large practical value for medical and social rehabilitation of patients.

1. To define the clinical symptoms of degenerative – dystrophic defeats of joints (violations of step, limitations of active and passive movement in all planes in joints, types of contractures, presence of shortening of extremities and other symptoms).
2. To interpret the sciagrams of degenerative-dystrophic diseases of large joints of upper and lower extremities.
3. To be able to conduct differential diagnostics with the specific and non specific diseases of joints.
4. To Ground the plan of pathogenetic medical treatment degenerative – dystrophic diseases of joints (conservative and operative) taking into account a form, stage of process, age of sick, profession and concomitant diseases.

Program of independent work of student to practical employment.

Task 1. *On the basis of knowledge and abilities, acquired during the study of normal anatomy of man, histology and radiology, physiology, listened lectures and acquired practical skills from traumatology and orthopaedy, give writing answers for such questions:*

1. What elements of joint are struck at the degenerative-dystrophic diseases and why?
2. Structure of cartilage and exchange processes in him (schematically to sketch the layers of cartilage).
3. Schematically to sketch axial deformations of extremities.
4. To give determination of «contractures», «ankylosis». Types of contractures, ankylosis.
5. What roentgenological differences of osteoporosis and osteosclerosis?

Task 2. *On the basis of study of basic and additional literature from the theme of employment give written answers for such questions:*

1. What main reasons leads to the origin of degenerative- dystrophic defeats of joints?
2. Pathogenesis of degenerative-dystrophic defeats of joints.
3. Basic clinical signs of deformative osteoarthritis, aseptic osteonecrosis, cystic alterations on different stages of process.
4. What roentgenologic signs of degenerative - dystrophic defeats of large joints depending on the form, stages of process (schematically to sketch the stages of process at deforming arthrosis)?
5. What methods are used at medical treatment of degenerative -dystrophic defeats of joints taking into account the form, stages of process?

6. Expose essence of conservative medical treatment:
 - a) orthopaedic;
 - b) medicinal;
 - c) physical therapy;
 - d) balneological.
7. Testimony, basic principles of operative medical treatment of degenerative – dystrophic defeats of joints taking into account the etiologic factor of disease?

Program of independent work of students on practical employment.

Task 3. *Microcuration.*

1. To capture practical skills of inspection of orthopedic – traumatological patient at the -diseases of joints.
2. To capture practical skills of clinico-roentgenologic diagnostics of deformative osteoarthritis, to conduct differential diagnostics of degenerative-dystrophic diseases.
3. To capture knowledge of basic modern methods of medical treatment of degenerative-dystrophic diseases.

Sequence of action:

1. In taking of anamnesis to pay attention to heredity, character of labour, development of children, on a prophylaxis and medical measures. To expose unfavorable professional and other concomitant factors.
2. Review: to define the character of step, type of lameness and axial deformations of extremity, violation of configuration of joints, hypotrophy and atrophy of soft tissues.
3. Palpation: to define the places of severe pain in the region of large joints and surrounding tissues, presence of free liquid in a joint, skin temperature (general and local).
4. Functional inspection:
 - a) To determine length and axis of upper and lower extremities (anatomic, functional and relative shortening);
 - b) To determine the volume of active and passive motions in the joints of upper and lower extremities in norm and in the disease of joints;
 - c) Types and character of contractures, ankylosis;
 - d) To be able to measure valgus and varus deformation of upper and lower extremities.
5. To interpret sciagrams at the degenerative-dystrophic defeats of joints.
6. To ground a diagnosis and conduct differential diagnostics.
7. To work out a plan of medical treatment (orthopedic, medicinal, physical therapy, balneological) and ground him.
8. To give a medical, social and labor prognosis.

To ground a diagnosis, to show the constructed plan of medical treatment to the teacher, to take part in the discussion of theme of practical work by asking questions.

Task 4. *For verification of capturing your material of practical employment solve such tasks:*

I. In a polyclinic the patient consulted with complaints about pain in the left hip joint which increases after the protracted circulation and limitation of movement (extension, adduction). Pain in a joint began after the second delivery. And anamnesis: in childhood the patient treated oneself concerning dysplasia of hip joint, and in recent three years of lumbo-sacral radiculitis. At a review hypotrophy of muscles of the left thigh, limitation of extension of the left lower extremity is determined, shortening of the left lower extremity on 1,5sm in hip joint.

1. How to define the functional shortening of the left lower extremity?
2. How to define the volume of active and passive movement in all planes?
3. Preliminary diagnosis.
4. What additional diagnostic inspection needs to be applied?
5. Final diagnosis and ground of plan of medical treatment taking into account the etiologic factor.

II. A patient consulted a Doctor with complaints on pain in the knee-joint appealed, sharp limitation of motions, violation of step, pain increases during walking and fully disappears at rest. From anamnesis it is found out, that during 8 years after the trauma of the left knee-joint a patient did not appealed for help. At a review there is the knee-joint of ordinary form and configuration. At palpation there is a temperature in the region of joint within the limits of norm. Pain is localized along a medial copula, active and passive motions within the limits of norm. On the sciagram of the left knee-joint in motions within the limits of norm. On the sciagram of the left knee-joint in front-back projection of narrowing of joint crack, regional bone excrescences anymore on a medial surface, subchondral sclerosis.

1. Initial diagnosis?
2. What roentgenologic difference of osteoporosis and osteosclerosis?
3. What diseases of knee-joint it is necessary to conduct differential diagnostics by?
4. Your plan of medical treatment.

III. A patient appealed with complaints about pain in a right talo-crural joint at walking. Works as a longshoreman. It is known, that 2 years the fracture of both bones with displacement happened prior to it. At a review – skin is usual color. At palpation – local

temperature within the limits of norm, limitation of motions in a right joint (back bending) shin-foot at the static loading is multiplied valgus deformation of foot. On the sciagram of right joint (sciagram without the static exertion) shin-foot insignificant narrowing of joint crack, subchondral sclerosis.

1. by what to account for valgus deformation of foot of the static loading and how to define it?
2. Plan of additional inspection.
3. Initial diagnosis and plan of medical treatment.

According to clinico-roentgenologic classification Cosinscoi N. S. but Rohlina And. G. (1961) to the group of degenerative-dystrophic changes of joints: deformities arthrosis, aseptic osteonecrosis and cystic alteration of bones are taken.

OSTEOARTHRITIS

(osteoarthrosis, deformities arthrosis – in Ukraine).

Definition it is defined as a degenerative, non-inflammatory joint disease characterized by destruction of articular cartilage and new bone formation around margins of the joint surfaces.

Joints have between the bones – a synovial or joint cavity. They form the most mobile joints in the body and hence are more prone for injuries.

It consists of a fibrous joint capsule which helps to hold the articulating bones together. The synovial membrane lines the joint space and secretes the synovial fluid. This fluid serves to lubricate the joints and provides nourishment for the articular cartilage. The articular cartilage is formed by the hyaline cartilage which is a unique type of connective tissue formed by specialized cell called chondrocytes.

Functioning of an articulate cartilage depends from metabolic, endocrine immune status, synovial membrane, when producing synovial fluid, subchondral bones (subchondral plate, bone trabecula, intertrabecular space, vascularization).

Ecological factors, biomechanical loadings influence.

- Disorders of synovial membranes are results in change of a feed of a cartilage failure of structure and viscosity synovial fluid, fibrosis, synovitis.
- Disorders of subchondral bones is resulted in change of a cartilage, discongruence of articular surfaces, to change vascularization, with loss of durability subchondral bones.
- Disturbances of an articulate cartilage is shown: change of function chondrocytes, biosynthesis proteoglycanes, biosynthesis of collagen all this results in development of Osteoarthritis.

Repetition

Sequence of pathological events in osteoarthritis fibrillation due to loss of water of the weight bearing

articular cartilage is seen in early stages of the disease followed by complete loss of articular cartilage. This puts enormous pressure on the tanderiying bone which causes sclerosis and later eburnation. Cysts may develop in the subchondral zone due to microfractures that degenerate. New bone formation takes place and results in osteophyte formation.

Who is prone to get osteoarthritis?

- Middle-aged patients
- Women have a greater tendency than men
- One in three people over 60 years are affected and more than three in four persons over the age of seventy show some radiographic evidence of the condition

- Very rarely it can be seen in younger people

Allocate primary, secondary osteoarthritis.

Primary osteoarthritis etiological causes for primary osteoarthritis though exact cause is not known, the following factor are suspected to play an important role in the causation of primary osteoarthritis—heredity – Genetically caused form.

Secondary osteoarthritis

1. Generalized form. Etiological causes for Generalized form osteoarthritis- disorders of metabolic processes)
2. Local (dysplasia (*Concentration of pressure load*), coxa vara, an inflammation (*Rheumatoid arthritis, TB*), trauma – Intra-articular fractures – *Incongruity of the articular surface, Instability joint*. Overuse of intra-articular steroid therapy, intoxication)

Osteoarthritis spine (spondylorthros)

Separately allocate osteoarthritis of joints spine (spondylorthros). This section of pathology, we shall consider in the subsequent lectures.

The Ukrainian Association of Rheumatologists

Classification osteoarthritis

Clinical forms

- Monoosteoarthritis
- Oligoosteoarthritis (lesion of two and more joints)
- Polyosteoarthritis (lesion of three and more articulate groups)

Localization

- Osteoarthritis knee
- Osteoarthritis hip and other joints

(What joints are usually affected? Weight bearing joints like hip, knee, ankle, etc. Spine, Fingers)

Synovitis

1. With synovitis
2. Without synovitis

Radiological stage (for J.Kellgren and Lawrence):

0, I, II, III, IV

Functional ability of the patient (Functional insufficiency of joints)

- Work capacity is temporarily limited
- Work capacity no
- The patient requires assistance

Clinical features osteoarthritis are caused

1) Intraarticular changes, 2)extraarticular changes,3) Changes in an organism as a whole

1) Intraarticular changes:

- *reactive synovitis*
- *intraarticulate hyperpressing*
- *intrabone ischemia*
- *increase of intrabone pressure*
- *break subchondral cysts*
- *discongruence of articular surfaces*

2) extraarticular changes:

- *muscular – tonic reactions*
- *angiopathology*
- *neurodystrophic syndrome*
- *vertebral syndromes*

Signals from joint (arthritis) are picked up by sensory receptors in nerve endings. The environment of cartilage is alkaline. In dehydration it becomes acid. This acidity will sensitize the nerve endings that will register pain. More blood circulation is brought to the area, even if it has to come to the nearest sites in the fibrous capsule covering the joint. It is the swelling and stretch in the joint capsule that causes stiffness and eventually added pain. **Pain caused muscle spasm, then are nature way of immobilizing injury extremity. This muscular – tonic reactions at the arthritis Is results to depressed small vessels, nerves**

The pain is poorly localized and is dull aching in nature. Patient has mud swelling of joint and complains of early morning stiffness. Predominant symptom is pain which decreases on walking, because improve blood circulation, decreases intrabone pressure. Patient complains of early morning stiffness which subsides over the day after some activity.

The nerves then transmit the signal via the nerves leading from joint to the spinal cord, then into the brain where the signal is interpreted as pain. Pain is a self-protective mechanism which forces us to move away from danger, and afterwards, to rest the joint, giving the body the chance to heal itself.

From the spinal cord branch the 31 pairs of spinal nerves which pass out from the vertebral canal through the spaces between the vertebrae. Each nerve has 2 roots, the anterior which carries motor nerve fibres, and the posterior which carries sensory impulses. As both leave the spinal cord, the form a mixed spinal nerve on either side of the spinal column.

(Separately)

(Gate Control Theory devised by Patrick Wall and Ronald Melzack in 1965)

What are the structures that are involved in pain physiology?

Repetition

Intraarticular changes cause Painful muscular – tonic reflex answer, which cause **Chronic muscular spasm**, then **intraarticular hyperpressing**. In turn it results in development **Disorders (deficiency) of a feed of a cartilage, Spasm microvessels, depressed micronerves** which cause **neurodystrophic syndrome** of joint. Also **chronic muscular spasm** results in development **structural anatomical – biomechanical and metabolic changes** of joint and in combination with **vertebral factors** because development **neurodystrophic process** of joint.

How to make a diagnosis – osteoarthritis?

- Symptomatology.
- Instrumental diagnostic methods:
 1. Radiography, basically DS-signs:
 - Radiological stages for Kellgren и Lawrence: 0, I, II, III, IV.
 - Loss of joint space (due to destruction of articular cartilage).
 - Subchondral osteosclerosis (due to increase cellularity and bone deposition).
 - Osteophytes (due to revascularisation of remaining cartilage and capsular traction).
 2. Arthrosonography.
 3. MRI: noninvasive, informative and harmless.
 4. Arthroscopy – direct visual research of a cavity of a joint. « The Gold standard ».

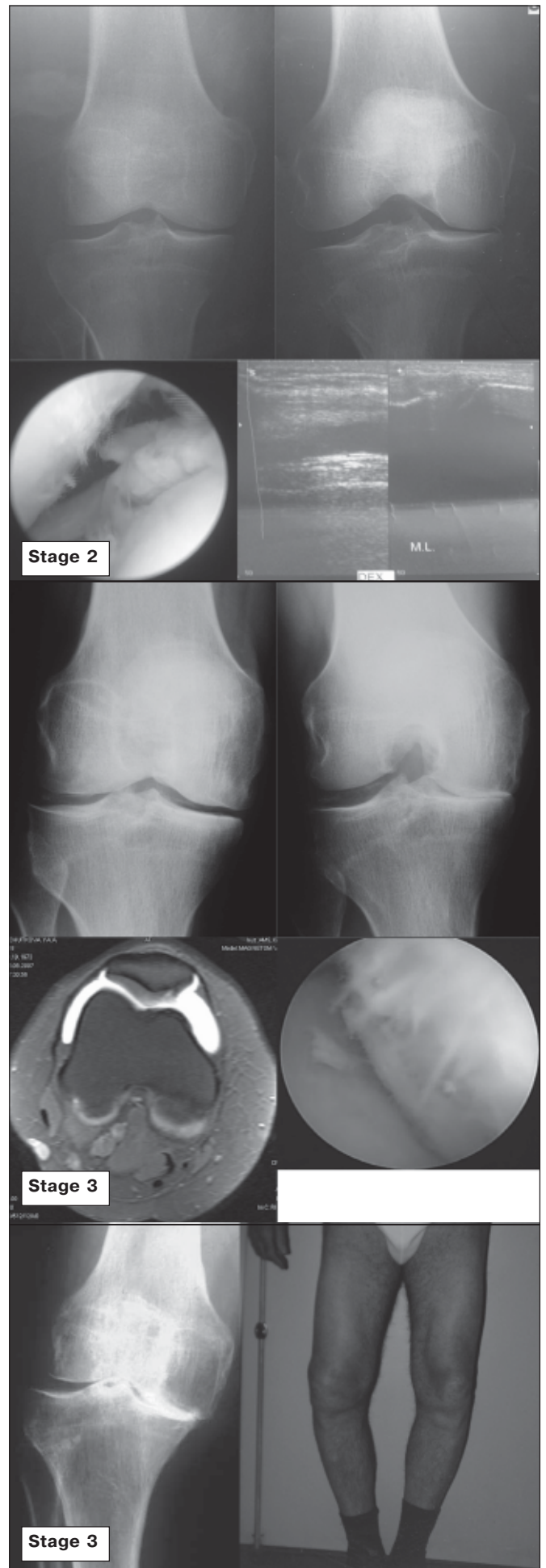
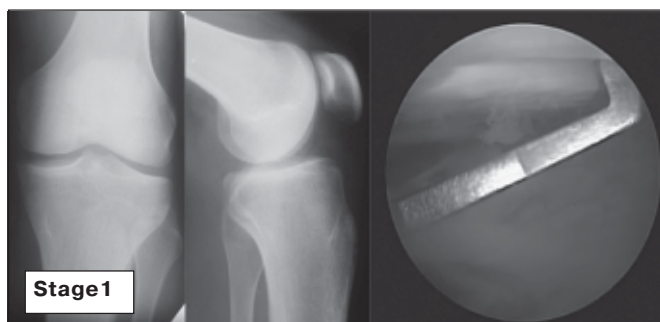
- Laboratory diagnostics:

Biological markers in synovial liquids: ↑(increase) ceratansulfates, ↓(decrease) chondroitinsulfates (CS), ↑proteoglycane, ↑CS4/CS6, ↑protease, ↑C-propeptide of collagen II type, ↑ fibronectin, ↑cytokines, ↑hyaluronidasum of serum.

Blood tests immunological markers: antibodies to collagen, CS.

- Physical examination.

Classification osteoarthritis



Clinical Features

Stage 1 prearthrosis In osteoarthritis of the hip joint patient is asymptomatic in the early stages, later patient may complain of slight pain lasting for 1 to 2 days. Patients reveal complaints about the unpleasant feeling, aching pain in a joint at the overload. All of them quickly disappears after rest. Muscle spasm, limp, restriction of terminal joint movements (limitation of extension in a joint (a symptom Is. T. Sclarenco) or limitation of external rotation in spherical joints) are the other complaints. Early morning stiffness.

Radiology. In the early stages no changes are seen.

Level of Biological markers metabolism of connective tissue in **serum** (sialine acid, glycoproteid, Glycoseaminoglycane) and in **Daily urine** (oxyproline) is defined.

Stage 2 arthrosis As the disease advances pain and more stiff, Patient complains of early morning stiffness which subsides over the day after some activity. Swelling of the joints restriction of joint movements – soft tissue contractures. Minimal tenderness and coarse crepitus can be elicited. If there are loose bodies in a joint, patient gives history of locking or giving way.

Radiological examination of the knee joint is the most important diagnostic tool. The following are the radiological features seen in osteoarthritis: joint space is reduced (25%), subchondral sclerosis, may be seen. macula osteoporosis appears. **Sonography enables to visualize the destroyed structures** of joints. **MRI and CT** scan also helps to diagnose, subchondral cysts, osteophytes, etc.

Stage3 Osteoarthritis Restricted range of joint movements (limitation of amplitude of active and passive movement in a joint). Appearance of flexor contracture of joints, hypotrophy of extensor muscles, **Deformity of joint.**

Radiology. Joint space is reduced (more 50%), Osteophytes (due to revascularisation of remaining cartilage **and capsular traction**).

Loose bodies (due to fragmentation of osteochondral surface).

• Deformity (due to destruction of capsules and ligaments).



How Does a Deformity Develop?

When a disease strikes the hip, the patient adopts a particular posture of say flexion, adduction, etc. to thwart the effects of pain. If this posture is maintained for a particular period of time by muscle spasm in the initial stages and by soft tissue contractures in the later stages, a permanent or fixed deformities develops. These deformities disturb the normal anatomy and function of the hip and the patient is unable to keep the legs parallel on the ground and walk. To enable the

patient to walk again, compensatory mechanisms develop in the spine and pelvis

Fixed flexion deformity is the most common deformity of joint disease. **The reasons for this being:**

1. In the position of flexion, the joint capacity is “maximum” and hence can accumulate more synovial fluid which is increased due to synovitis.

2. In this position the articular capsule of the hip ‘relaxes’ the most and thus lessens the effects of pain, spasm and distensions.

3. The flexors of the hip are more powerful than the extensors.

Stage 4 arthroso-arthritis. More synovial fluid in joint which is increased due to synovitis. Restricted range of joint movements, Deformity of joint Process progresses, pain takes a permanent character, considerable atrophy of muscles appears, extremity on a side is staggered. Acquire a permanent position, forms flexor-adducted contractures, external rotation of extremity, little mobility in a joint).

Radiology. Deformity and malalignment (due to destruction of capsules and ligaments) and subchondral cysts (due to synovial fluid intrusion into the bone). cyst like new growth in the head of thigh-bone. It is possible for subluxation at the hyperplastic forms of coxarthrosis.

Treatment

Purpose

- To slow down progressing osteoarthritis
- To reduce a pain
- To increase functional activity

Conservative methods which consists of the following measures.

- Reduction of weight
- Non-steroidal anti-inflammatory drugs (NSAIDs) and muscle relaxants.
- Intra-articular injections of steroids (not more than 2 recommended, local anaesthetic is avoided for fear of developing neuropathic joint).
- Antiosteoarthritis preparations
- Antioxidizer therapy: vitamin E, tiotriazolinum
- The preparations improving microcirculation
- Local application of ointments, gels, aerosols with NSAIDs
- Walking exercises. Isometric exercises.

About 50 per cent of patients respond to conservative treatment

Heat therapy is not, because increased synovitis

Mechanism of action of NSAIDa They have an inhibitory action on the following pain mediating agents.

- Prostaglandin synthesis
- Leucotriene synthesis



- Lymphocyte activation
- Oxygen radical generation
- Cytokine production, etc

NSAIDs

1. Preparations negatively influencing a cartilage (chondronegative NSAIDs) Derivatives of salicylic acid (Aspirinum) Antranilic acid (mefenaminum)

Derivatives of arylalkanoic acids — Derivatives arylpropionic acid (ibuprofenum, ketoprofenum) indolacetic acid (indometacynum)

2. Not influencing a cartilage (chondroneutral drugs)

Preferred derivatives of arylacetic acid — group diclofenacum; derivatives of pyrazolidindionum oxycamum

3. Preparations positively influencing a cartilage (chondropositive, chondromodelling) The combined preparations (Movalis, cerebrolaxum, Artrotenum (diclofenacum, meclozoprostum))

Slowly acted (effectived) preparations for treatment chondroprotectors, chondromodulators)

chondroitinum sulfate (Struktum)

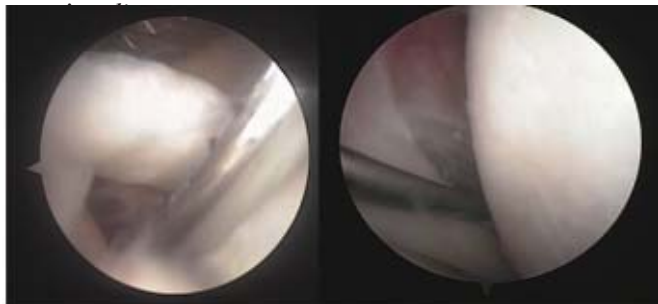
glucosaminm sulfate? (Dona – 200-S)

Preparations hyaluronic acids (Gyalganum)

Non-saponifying substances of an avocado and a soya Diacyreinum (ART – 50)

Surgical Methods

1. *Excision of osteophytes* is rarely done alone.
2. *Excision of loose bodies, tear meniscus* Indicated *meniscectomy* are best done by arthroscopy. *joint instability (tear ligaments)* → Indicated reconstructive

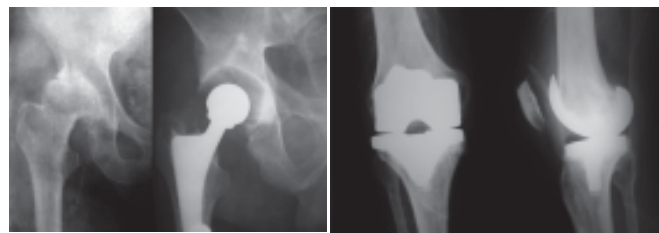


3. *joint debridement* are best done by arthroscopy.

4. Varus or valgus deformity, unicompartmental osteoarthritis knee with pain Indicated *Proximal tibial osteotomy (Slocum's)* or *Distal femoral osteotomy* -(Pain is decreased in 80 per cent of the cases following surgery as osteotomy changes the line of weight bearing and brings the more normal surface to carry out the function of load transmission).



5. *Total arthroplasty* In the late stages of osteoarthritis, in elderly and in restriction of flexion less than 70° The choice is total hip replacement (arthroplasty). This is indicated when both the compartments of the knee joint are destroyed or if valgus or varus deformity is more than 15°.



OSTEONECROSIS (aseptic necrosis)

Two forms exist, traumatic (the most common form) and atraumatic. Synonyms and related keywords: aseptic necrosis, avascular necrosis, ischemic necrosis

These terms to describe this disorder include avascular necrosis and ischemic necrosis to denote vascular etiology.

Classification

primary idiopathic (1/3) The third most common source – *the causal factor it is not possible to make*

Genetically caused (is heredity)

secondary Local (dysplasia) – trauma -intra-articular fractures. diabetes, overuse of intra-articular steroid therap, chronic intoxication – alcohol abuse. Coagulopathies, hyperlipidemia, thyroid disorders.

Steroid-induced osteonecrosis often involves multiple bones, in the case of the hip, results in nearly 100% bilateral involvement osteonecrosis associated with alcohol abuse usually occurs in those who drink more than 400 mL of alcohol per week or (a daily 1.5 L of red wine with an alcohol content of 10%).

Pathophysiology: Traumatic osteonecrosis is a direct result of disruption of blood supply to the femoral head. In atraumatic osteonecrosis- pressure increase within the femoral head, leading to vascular collapse and then necrosis. A fat embolism phenomenon with resultant vascular occlusion. Hyperlipidemic- chronic vascular occlusion.

Clinico-roentgenologic changes

I phase. The area of lightening with unclear contours is marked, not rarely regular shape – beginning of formation of cyst.

II phase. Absence of extension in a hip joint. Around the cell of compression it is visible strip of

lightening (demarcated area) and, quite often the expressed reactive sclerosis there is a cyst usually wrong form Expressed limited.

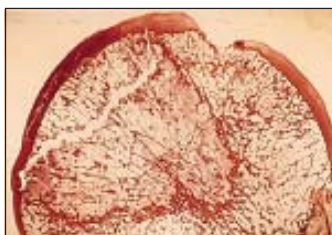
III phase. Permanent pain in the region of hip joint, violation of movement at least limitation of motion. It is determined by incongruence of joint surfaces due to a compression or bulging of necrotic area. Last diminished in a size, around the area of shadowing a reactive sclerosis is determined; a joint slit is some what narrowed. There is the increase of cyst in sizes, sometimes it is visible alteration and crack of its wall up to the extent that it bursts into joint, joint cavity and joint slit is unchanged.

IV phase. Strengthening of pain in the region of hip joint with an irradiation in the area of knee-joint, reduction of amplitude of motions, appearance of contractures, hypotrophy of muscles The cell of necrosis as a compression, incongruence joint surfaces is marked, regional bone excrescences on a head, narrowing of joint crack. At tearing away of necrotic area free bone-cartilaginous bodies in the cavity of joint, bulge of cortical layer of the most loaded surface. Flattening of head on the limited area (as a result of compression of wall of bone), structure it's heterogeneous due to alteration and reactive changes around the bone, regional bone excrescences.

V phase. Subsequent strengthening of pain, limitation of motions in hip joint, contractures, muscle atrophy. Sharp narrowing of joint slit, that confirms degeneration of joint cartilage, the more the expressed deformation of head and depression with regional bone excrescences. Deformation of head of thigh-bone grows, acetabulum due to regional bone excrescences.
Classification of aseptic necrosis of head of thigh-bone:



1 stage - stage of the initial phenomena



2 stage - stage of compressive fracture



3 stage - stage of secondary arthrosis



4 stage - stage of output

1 stage — stage of the initial phenomena. Clinically characterized by non-intensive pain which increases in

exertion. Pain usually is deep and throbbing and is worse with ambulation, but it also is significant at night. Onset often can be described as acute. Limitation of internal rotation is determined only. Passive internal rotation in extension being particularly painful. A Trendelenburg gait often is present.

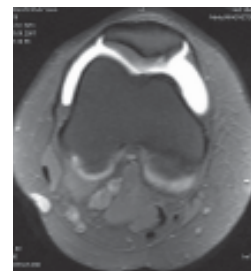
There can be a remote pain in a knee joint, which can be single sign.

Roentgenologically. In the region of head an area with unclear contours is determined, keel like or segmentary forms (symptom E.T. Scljarenca) it is possible to look for violation of structure of bone tissue of head as hearths of osteoporosis and osteosclerosis the zone of necrosis is surrounded by repair tissue as revascularization is occurring

MRI

Sensitivity and specificity is greater than 98%, MRI should be performed in all patients of osteonecrosis to assess the extent of the disease.

Informing of MRI is considerably multiplied at introduction of contrast to the explored joint.



This is arthroMRI.

2 stage — stage of compressive fracture. Transition in a 2 stage is accompanied by appearance of intensive pain from the compressive fracture of head. In subsequent pain becomes less intensive and increases in exertion. Movement in joint is sharply limited externally, internal rotation and extension.

Roentgenologic signs: expansion of joint slit; head of thigh-bone — contours are broken due to an compressive necrotic focus (subchondral collapse) in anterosuperior part which most loads up, focus necrosis differentiates distinctly due to increased roentgenologic density around the area of osteolysis and reactive sclerosis. Flattening of femoral head

A — Mild: <15% of surface or <2-mm depression

B — Moderate: 15-30% of surface or 2- to 4-mm depression

C — Severe: >30% of surface or >4-mm depression

3 stage — stage of secondary arthrosis. Pain is intensive, permanent, diminishes at rest.

Motions are limited in all three planes, appear flexor-adductive contractures.

Roentgenologically regional bone excrescences appear, uneven narrowing of joint crack, the changes of contours of head are determined. Focus of necrosis differentiates distinctly, surrounded by the area of osteolysis and sclerosis.

4 stage – stage of output.

Intensive, permanent pain is determined. Movement in joints are absent or sharply limited, expressive flexor-adductive contracture.

Roentgenologic signs:

acetabulum is deformed, considerable regional bone fragments are determined, Joint slit is narrowed significantly. saddlelike deformation of head, there are considerable regional bone excrescences.

The focus of necrosis is fragmented, sclerosis, the width of areas of osteolysis and osteosclerosis is diminished.

Treatment

1 stage *Conservative methods* which consists of the following measures.

- Reduction of weight (extension – 5 kg., crutches)
- Non-steroidal anti-inflammatory drugs (NSAIDs) and muscle relaxants.
- The preparations improving microcirculation

Surgical Methods

Decompression of intraosseous space – lower interosseous pressure

Core decompression and cancellous and cortical bone grafting procedures 1 stage.

Correction *osteotomy* 2 stage

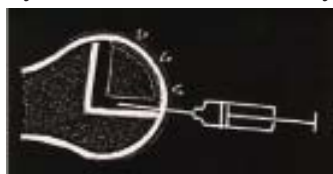
Total hip replacement (arthroplasty) – 3-4 stage

Now bone marrow harvesting and (This centrifuging technique yields a “concentrated myeloid suspension) **reinjection**, in the treatment osteonecrosis by bone marrow autograft

Necrotic segment is monitored with fluoroscopy.

USE OF CEMENT FOR RESTORATION OF FEMORAL HEAD SPHERICITY (cement injection).

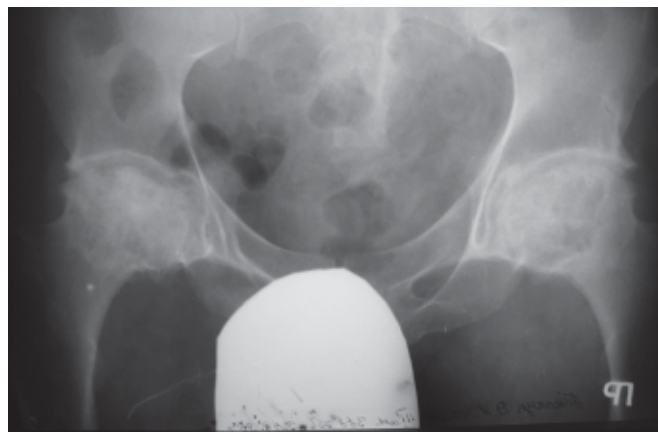
To restore the sphericity of the femoral head by elevating the necrotic segment and keeping it in its correct position, by the injection of cement (acrylic cement).



CYSTLIKE ALTERATION

In cystic alteration of epiphysial area cysts are selected:

1. stage – origin of single cysts – shadow of the rounded form in the epiphysial area of bone;
2. stage – expansion and confluence of cysts in a focus;
3. stage – breach of cysts in a joint cavity, deformation of joint surfaces.



Non surgical treatment: general principles correspond to treatment of osteoarthritis

Surgical Methods

- 1 stage - Tunneling, excochlietion of necrotic focus of head and autoplatic bone graft with spina illiaca
- 2-3 stage - Total hip replacement (arthroplasty)

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