GUIDELINES
Individual work of students

<table>
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<tr>
<th>Educational discipline</th>
<th>Surgical stomatology</th>
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<tr>
<td>Module № 1</td>
<td>Propaedeutics Surgical Stomatology</td>
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<td>Content module 2</td>
<td>Tools and techniques removal of teeth and root</td>
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<tr>
<td>Theme</td>
<td>Hematogenic, contact and traumatic osteomyelitis of jaws. Clinic, diagnostics, medical treatment.</td>
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Poltava
1. The theme uppericality.

Hematogenic, contact and specific osteomyelitis of jaws compound from 3,5 up to 10 % of all osteomyelites of jaws. An etiopathogenesis, diagnostics, prophylaxis and the treatments of these forms of osteomyelites of jaws on the present imagine a difficult problem. It is explained to that series of questions of a pathogenses, prophylaxis and treatment of an osteomyelitis of jaws for the present not certain. In the same time the change of a clinical course of osteomyelites is observed, the character of complications, method of their treatment variates.

2. The objectives of the studies.

To have common views about a state of a problem of a hematogenous, contact and traumatic osteomyelitis of jaws.

To know features of an etiopathogenesis, clinic, diagnostics, clinical course of the given forms of an osteomyelitis.

To be able to collect an anamnesis of life and disease of the patient with an osteomyelitis of jaws. To be able to carry out differential diagnostics of the different forms of an osteomyelitis.

To take possession of methods of diagnostics of a hematogenous, contact and traumatic osteomyelitis of jaws, engineering of operative treatment.

3. Basic knowledge, skills, skills necessary for study topics (interdisciplinary integration).

<table>
<thead>
<tr>
<th>Name of previous courses</th>
<th>These skills</th>
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<tbody>
<tr>
<td>Anatomy</td>
<td>To take into account anatomical features of a structure of the upper and lower jaws at operative measures</td>
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<tr>
<td>Gistology</td>
<td>To take into gistology features upper and lower jaws in development of an osteomyelitis of jaws.</td>
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<tr>
<td>Pathophysiology</td>
<td>Etiology and pathogenesis inflammatory diseases maxillofacial region.</td>
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<tr>
<td>Microbiology</td>
<td>To carry out clinical, laboratory, instrumental diagnostics of an acute odontogenic osteomyelitis of jaws.</td>
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<td></td>
<td>To be able to carry out an assessment given of a laboratory blood analysis, urine at the patients with inflammatory diseases.</td>
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<tr>
<td>Propedeutics of intrinsic illnesses</td>
<td>To be able to nominate medical agents to the patients with inflammatory diseases of maxillo-facial region.</td>
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<tr>
<td>Pharmacology</td>
<td>Pharmakokinetics and pharmacodynamics of preparations, which are applied to treatment of a hematogenous, traumatic and contact osteomyelitis.</td>
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</table>

4. Tasks for independent work in preparation for the classes.

4.1. A list of key terms, parameters, characteristics that must learn the student in preparation for the lesson:
<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
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<tr>
<td>Osteomyelitis</td>
<td>inflammation of a bone</td>
</tr>
<tr>
<td>Hematogenous</td>
<td>spread of infection through blood vessels</td>
</tr>
<tr>
<td>Lymphogenous</td>
<td>spread of infection in lymphatic vessels</td>
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4.2. **Theoretical questions to lesson:**

1. What means term "osteomyelitis" and in what his essence consists?
2. Name the factors, congenial for development of an osteomyelitis of jaws?
3. Pathological anatomy of an osteomyelitis of jaws?
4. Modern classification of an osteomyelitis of jaws?
7. General and aboriginal complications of an osteomyelitis?

4.3. **Practical works (tasks) are performed in class:**

- To carry out observation of the patient with a hematogenous, contact, traumatic osteomyelitis of jaws;
- To familiarize with methodise of disclosing subperiosteal abscess; sequestectomies;
- To carry out differential diagnostics of an osteomyelitis with other inflammatory diseases of maxillo-facial range;
- To make a treatment planning of the patient with a hematogenous, contact, traumatic osteomyelitis of jaws.

5. **Theme contents:**

From anatomy-physiological features in a constitution of jaws it is necessary to note, that on the upper jaw more expressed spongiform material of a bone, than on a mandible, where prevails teeth compact material a bone. Between bone балочками settle down a plenty of a myeloid tissue and red bone brain. The bones of jaws penetrated nutrient (haversian) by caanals, which assist diffusion of inflammatory process.

The hematogenic, that was developed due to drift of an infection contamination in a bone by a hematogenic way from the locus placed far from a place of a lesion. The hematogenic osteomyelitis appears at children - neonatal and in the age of 3-4 years. The upper jaw is damaged more often, than lower. A hematogenic osteomyelitis on nature - one of the forms of a septicopyemia. Entrance infection atriums is umbilical sepsis, pustular of a lesion of a skin (strepto- and staphyloderma), microtrauma of a mucosa of an oral cavity, chroniosepsis, otites, infringements corrected of a care of the child at presence of a mastitis in the mother. Agents - mainly coccal flora, colon bacillus, Bacillus aerugenosa, Proteus.

The process begins is acute, with expressed intoxications. Per the first 2-3 day of local signs so it is not enough, that the diagnosis is well-timed is not established.
The complaints of the parents to exaltation of the child, crying, abandoning of nutrition, bad dream, fervescence.

Clinic. On clinical course distinguish 3 forms of a hematogenous osteomyelitis - toxic, septicopyemic and circumscribed-local. Last at children practically does not meet.

The toxiferous form has rough course - is accompanied by a heat of a body, sharp intoxication. During examination the tachycardia is taped, the respiration becomes often and superficial. In a blood - picture of a hypochromia anemia, leukocytosis, alteration of the formula to the left, augmentation erythrocyte sedimentation rate (ESR), hypoproteinemia. On a background of the expressed general picture the local clinical signs are erased. The captious survey can show an insignificant edema of a mucosa of an alveolar process and hardly appreciable hyperemia it. The signs of a lesion of a jaw occur only for 4-6 day the ambassador of a beginning of disease.

The septicopyemic form also is characterized by fast development, quick deterioration of a general state of the child. As against the toxiferous form the local attributes accrues quickly.

At a lesion of the upper jaw there is tumescence in infraorbital region and infiltration of soft tissues. Owing to an inflammation of a fat of an orbit can be observed exophthalmus; is defined chemosis of a conjunctiva, the eye is closed. In 2-3 days from a beginning of disease purulent exudates found the cortical layer of a bone also leaves under a periosteum. The alveolar process of a jaw is deformed from both parties, transitive fold flattened, the mucosa bloodshots, infiltrate. Can be defined fluctuation. The presence of primary infiltrates and fistulas is characteristic. In case of a lesion of medial departments of the upper jaw the laboured nasal respiration because of a rhinedema, abjection of pus from the conforming nasal course is observed. The tumescence and infiltration of tissues in region of an intrinsic angle of an eye, edema of blepharons is defined; the skin of these fields is intense, bloodshot. The mucosa of an alveolar process is hydropic, bloodshot, transitive fold flattened at the expense of an infiltrate posed on an anterior surface of the upper jaw. The process is distributed to a clivus of a nose. The fistulas near an intrinsic angle of an eye are formed. Both compact plates of a bone can be exposed to a destruction, in such case the break of pus in a nasal sinus or in a maxillary sinus is observed.

If are struck larerals departments of the upper jaw (zygomatic processus), nasal respiration free. There is an infiltrate in the upper department of a cheek, the sharp edema of blepharons, exophthalmus is observed, a sclera and conjunctiva bloodshot, appreciable mucopurulent abjection on blepharons. The process is distributed to zygomatic bone, the pus breaks on lower orbital margo near a outward angle of an eye, the formation of fistulas on an alveolar process is possible. The destruction of germs of temporary teeth is observed.

In case of transition of disease in a chronic stage for 1-2 weeks the small sequesters are formed. The large sequesters it is usual on the upper jaw are not shaped. The appearance they can be caused by irrational treatment. The follicles of constant teeth can perish sequestered and sustain inflammatory process.
The bilateral diffuse lesion of the upper jaw is extremely seldom observed which is accompanied by development of a phlegmon of retrobulbar space.

If the mandible (articular process) is struck, in 3-4 days from a beginning of disease in subzygomatic and auriculo-masticatory regions the inflammatory infiltrates educe. Exudates is distributed in the party of an outside acoustical course, which is accompanied dissolution of a bone last with formation of fistulas.

The sequesters are shaped, therefore terms of formation are delayed on 3 and more than months.

Radiological about 6-7 days in jawbones find attributes diffuse dissolution. The presence of sequesters is defined by 3-4 weeks from a beginning of disease.

At a laboratory blood analysis and urine there are changes inherent to acute serious inflammatory process (erythropenia, leukocytosis, rising erythrocyte sedimentation rate (ESR), shift of the formula to the left, appearance of C - reactive protein; in urine - presence of protein, erythrocytes, leucocytes)). In purulent contents find cells of a red bone brain.

The diagnosis is established on the basis of given of an anamnesis, study of the complaints (sharp infringement of a general state of the child - exaltation, abandoning of nutrition, bad dream, temperature of a body up to 39-40°C), given of objective inspection (edema of soft tissues around of the upper jaw with a bloodshot skin above it, smoothness transitive fold and fluctuation during a palpation, bilateral thickening of an alveolar part or process), given blood analysis and urine.

Differential diagnostics will be carried out with a odontogenic osteomyelitis, periostitis, phlegmon, diseases of a middle ear, acute inflammatory diseases to an eye and orbit, specific lesions of bones, benign and malignant neoplasms.

Treatment: etiopathogenic, complex, is carried out only in conditions of a hospital, includes an acute management and intensive care directed on elimination to an intoxication, anti-inflammatory, fortifying treatment, immunotherapy.

The medicament therapy per the first days will be carried out extremely intravenously.

The surgical treatment includes an adequate incision abscess and infiltrates of soft tissues, subperiostal abscess with the further drainage of wounds and conducting them by a principle of purulent maxillo-facial surgery.

Complications of a hematogenous osteomyelitis can be transition in a chronic stage, sepsis, mediastenitis, arthritis, parotitis, destruction of regions of growth of a jaw and germs of constant teeth, abscess and phlegmon.

Consequences of a hematogenous osteomyelitis: secondary deformations of jaws, bones, soft tissues of maxillo-facial region, cicatricle eversion of eyelid, adentia, obliteration of a maxillaries sinus, one and bilateral ankylosis temporalmandibullar of a joint.

**Osteomyelitis in nursing & infants (osteomyelitis maxillaris neonatum).**
In most cases the infection is caused by Staphylococcus aureus. The microorganisms are believed to enter the wounds made during delivery when the finger is inserted into the child's mouth and the mucosa is scratched or later through injuries of the oral mucosa made by sucking a foreign object. Others believe the disease also may be caused by infections from the infant's nose. Hematogenous invasion by streptococci or pneumococci also has been reported.

**Clinical findings:**

Osteomyelitis in infants may have a sudden onset and run an acute course. Such cases are associated with a severe constitutional reaction; high fever, rapid pulse, vomiting, delirium and prostration. In other instances the disease may run a chronic course with a slow onset, slight fever, and moderate pain. The local signs are swelling of the face, with edema of the eyelids, and subperiosteal abscesses that develop on the alveolar mucosa and palate, followed by sinus tracts draining pus. In some cases pus is discharged from the nose.

Lowered resistance plays an important part in this disease, and, because the infant may refuse nourishment, feeding becomes a problem. Parenteral feeding may be necessary; proteins and multivitamins is necessary; proteins and multivitamins should be supplied abundantly. In pre-antibiotic days the mortality was high; death usually occurred by spread of infection to the brain (i.e. cavernous sinus thrombosis) or from toxemia. With the advent of antibiotics, death is rare and morbidity has been greatly diminished.

**Radiographic findings:**

Radiographs are usually of little value in making an early diagnosis, since there is minimal bone involvement at first. In long standing cases dental films may help to locate sequestra that may form or necrotic tooth germs, which may have to be removed.

**Treatment:**

Antibiotics should be given intravenously. A culture should be taken from any discharge that may exude from a sinus tract or the nose. If the bacteria are penicillin resistant, other antibiotics such as erythromycin or tetracycline should be given initially. An antibiotic sensitivity test should be made as soon as possible. Many cases of acute osteomyelitis can be cured by means of antibiotics, without recourse to surgery penicillin gives a good result. Intraoral incision should be made if there is an indication of a subperiosteal or palatal abscess. If a sinus tract is present, irrigations should be done frequency until the acute phase of the disease has subsided. Later sequestrectomy of the removal of dead tooth germs should be undertaken as indicated by the clinical and radiographic findings. Surgical interference should be conservative, since the loss of bone and teeth often causes severe deformities. All children who have had sequestrectomies should be carefully watched by an orthodontist, who may be able to aid in the development of the arch and maintenance of the occlusion. Developing teeth may show hypoplastic defects when they erupt, similar to those in Turner's syndrome.

**Contact osteomyelitis.**
By the cause, which will cause a contact osteomyelitis, there is a rather long contact of jawbones with purulent exudates.

It takes place at osteomyelites, chronic not specific periostites, furuncles and anthraxes. Pots exercising feedings of a bone in this case are damaged. A clottage, vascular embolism, microbial an intoxication invoke a marginal necrosis of jawbones. The majority of sequesters thus it do not appear.

Differential diagnostics will be carried out with a odontogenic osteomyelitis, periostites, malignant neoplasms, which festered cyst jaws.

The diagnosis is established on the basis of given of an anamnesis, clinic- of laboratory, accessory methods of diagnostics.

Treatment: etiopathogenic, complex. The surgical treatment consists in treatment of disease, which has caused a contact osteomyelitis. After formation of sequesters will carry out sequestectomy. The general treatment is described above.

**Traumatic osteomyelitis of bones face.**

The traumatic osteomyelitis complicates an adhesion of the open fractures of bones of the face. In children's and youthful age in peacetime time meets seldom. Infection of an bone wound descends through micro- or seen breakages of a mucosa of an oral cavity, nose or maxillary of a sinus, less often - through wounds of a dermal integument of the face.

On clinical course of process distinguish an acute and chronic traumatic osteomyelitis. The clinical picture of an acute traumatic osteomyelitis differs from a picture of an acute odontogenic or hematogenic osteomyelitis. At a odontogenic and traumatic osteomyelitis the inflammatory locus educes centrally, in the closed space of bone material. Thus the development of acute process is accompanied by rising intraosteal of pressure, which invokes a general intoxication and development of a megalgia. The odontogenic and hematogenic osteomyelitis has course an acute contagion. The main difference of a traumatic osteomyelitis consists that the process at a trauma proceeds in the open bone. Inflammatory exudates from a beginning of disease has a free output for borders of a bone, therefore development of process is not accompanied by an expressive general and local symptomatology. The initial signs of an acute osteomyelitis pass imperceptibly for the clinician, as frequently are regarded as a consequence of a trauma as such. As a late sign of an acute traumatic osteomyelitis it is necessary to consider development abscess and phlegmons in mild tissues.

The traumatic osteomyelitis more often is diagnosticated in a chronic stage. In this term the attenuation of acute inflammatory signs and gradual increase of proliferative ossifying processes is observed. In an oral cavity there are fistulas with purulent exudates. The germs of constant teeth, which are in the pathological locus, perish.

X-Ray the reaction of a periosteum is defined which is characterized by construction of a young bone, cuff, which covers a place of fracture. The line of fracture loses a sharpness of borders, in this field there is a region of underpressure of a bone. The germ, which was lost, loses precise contours, in a region of growth of a germ the destruction of a bone accrues.
The principle of treatment of an acute and chronic traumatic osteomyelitis remains same, as well as at treatment of odontogenic process. The special attention should be paid on careful bracing of bone fragments. Necrotizing germs of dens are subject to extraction.

Aseptic traumatic osteomyelitis (aseptic traumatic necrosis). In children's and young age, which reminds on clinic-roengenological to manifestation an osteomyelitis, can educ at the closed trauma of a bone. A bruise or fracture of a bone can result in development of an aseptic inflammation of bone material. The process is usually localized in range lower orbital of edge, zygomatic bone or branch and angle of a mandible. The first signs of disease occur in 2-4 weeks after a trauma and find as a thickening of a bone, which slowly accrues. In the pathological locus there is a weak pain, which sometimes strengthens at the night. The palpation of a bone is morbid.

On a roentgenogram the numerous locuses resorption spongiform and cortical substance are defined. In region of underpressure of a bone there are fields of an osteosclerosis, which remind sequesters. Outside a bone there is appreciable stratose periosteal a constructed bone. Than more prescription of disease, especially are more expressive rearrangement and proliferation of a bone.

Diagnostics of this disease complex also will be carried out on the establishment of generalization given an anamnesis, clinical and X-Ray signs. Frequently disease should be differentiated with bone tumoral process and to resort to the open surgical biopsy.

The treatment consists from anti-inflammatory of measures in a combination to physiotherapeutic procedures.

3.5. Materials for self control:
A. Assignments for self control (tables, charts, drawings, graphs).
B. Self-control tests:

1. Osteomyelitis it: A) Inflammatory process, which covers tissues of a periodontium and is distributed to environmental bone frames;
B) Infection-allergic purulent - necrotic inflammatory process, which arises in a bone under influence as exogenous (physical, chemical, biological), and endogenic (neyrohumoral, the endointoxication) factors on a background of the previous sensibilization and secondary immunosupretion of an organism and is accompanied by a necrosis of an bone tissue.

2. In what age most more often the hematogenous osteomyelitis educes?
   A) At children of one - two years;
   B) In teenage age;
   C) At 21-35 of years;
   D) At 35-60 of years.

3. At the patients the hematogenous osteomyelitis with what jaws more often meets?
A) Upper;  
B) Lower.

4. The clinical manifestation at a hematogenous osteomyelitis are characterized by clinic:  
A) Acute periostitis;  
B) Acute periodontitis;  
C) Signs of all inflammatory diseases.

5. The flow of pus from a nose at an osteomyelitis of the top jaw at children testifies to diffusion of process on what part of a bone?  
A) Medial and maxillary sinus;  
B) Lateral;  
B) Anterior and angle vein of the face.

6. What lesion lower orbital of edge maxillaris of a bone at an osteomyelitis of the top jaw at children?  
A) Only completely;  
B) Only particulate;  
C) Completely or particulate.

7. At what localization the osteomyelitis of a mandible at children proceeds most hardly?  
A) Alveolar process;  
B) Body of a jaw;  
C) Angle of a mandible.

C. Problem for self-checking:

1. To the patient A., 2 years the acute hematogenous osteomyelitis of the left upper jaw and primary fistula on a palate is diagnosed. In what conditions it is necessary to carry out treatment of the patient?

2. At examination of the child the tumescence in infraorbital region, exophthalmoses, chemosis of a conjunctiva is defined, the eye is closed, labored nasal respiration, abjection of pus from a nasal course. Define the clinical diagnosis:  
A) Hematogenous osteomyelitis of the upper jaw, retrobulbar abscess, chemosis of blepharons;  
B) Hematogenous osteomyelitis of a mandibles complicated retrobulbar abscess;  
C) abscess of infraorbital region.

3. The mother with the boy 5 years has addressed to the doctor with the complaints to deterioration of appetite, periodic fervescence, insignificant abjection of pus
from an oral cavity, tumescence of tissues, adjaw. From an anamnesis the mother has informed, that week back child has fallen and has hit by a chin. Local - infiltration of mild tissues, regional lymph nodes enlarged, are painless at a palpation. The alveolar process enlarged from both parties. The fistulous course with purulent abjointed is defined. At a palpation of a jaw the sign step is defined. The laboratory parameters testify to flaccid chronic process. On a roentgenogram - not a precise line of fracture with augmentation of volume of a bone. Define the clinical diagnosis:
A) Fracture of a mandible;
B) Osteoblastoclastoma of a mandible;
C) Acute odontogenic osteomyelitis of a mandible;
D) Fracture of a mandible, chronic traumatic osteomyelitis of a mandible;
E) Chronic periostitis of a mandible.

Basic:

Additional:

MEDICINAL PREPARATIONS

Rp.: Sol. Analgini 50 % of 50mg/kg
S. I/m with the purpose of a premedication.
#
Rp.: Sol. Dimedroli 1 % 1 ml
S. On 1 ml of an in / muscle with the purpose of a premedication.
#
Rp: Cefazolini 5-7,5мг/kg
D.t.d. N 10
S. Contents vial to dissolve in water for injections to introduce i/m 4 times on pores.
#
Rp: Lincomicini hydrochloridi 30 % of 5-7,5 mg/kg
S. Introduces into a muscle 2-3 times per day.
Methodical recommendations is prepared by docent Rezvina Ye.Yu.
STANDARDS OF ANSWERS

Tests
1 – B; 2 – A; 3 – A; 4 – C, 5 – A, 6 – C, 7 – C.

Standards of answers to a problem:

1. In conditions of a hospital.
2. A.
3. D.