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ДОБРОКАЧЕСТВЕННЫЕ НЕОДОНТОГЕННЫЕ ОПУХОЛИ КОСТЕЙ ЧЕЛЮСТНО-ЛИЦЕВОЙ ОБЛАСТИ

BENIGN NON-ODONTOGENIC TUMORS OF MAXILLOFACIAL BONES

Учебно-методическое пособие

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INTRODUCTION

The problems of diagnosis, treatment, and prevention of neoplasms of the maxillofacial area remain among the priorities in the science of oncology, as the head and neck occupy 9 % of the entire surface of the human body. However, the pathological formations developing in the maxillofacial region are extremely diverse in their genesis, due to the fact that all three embryonic sheets participate in the formation of the organs and tissues of the head. Moreover, possible are tumors that are characteristic only for this region, i. e. salivary gland tumors and odontogenic tumors. Benign tumors refer to tumors of the most diverse morphology, but they have one prognostically favorable property, it being their slow growth and metastasizing, and frequent involution (I. V. Davydovsky, 1962).

This methodological guide provides only basic information on the most common non-odontogenic benign tumors of the maxillofacial region. In connection with the different embryogenesis of tissues and organs of this area, as well as their various functions, the issue of diagnosis and treatment of neoplasms presents doctors with a challenge.

The aim of the lesson is to diagnose benign tumors of the bones of the facial skeleton on the basis of the clinical examination, clinical and roentgenological data and the findings by special methods, to carry out differential diagnostics with malignant tumors of the maxillofacial bone, tumor-like formations and inflammatory diseases of the maxillofacial region.

Objectives of the lesson:

1. To learn to draw up a plan for examining patients with benign tumors of the facial bones; to collect anamnesis; to identify clinical symptoms; to be able to conduct differential diagnostics with malignant formations of the bones of the maxillofacial region, tumor-like formations and inflammatory processes.

2. To learn to read the radiographic signs of benign tumors of the maxillofacial bones and make a comparative analysis with the X-ray picture of malignant tumors; to learn to make a complex treatment plan for patients with benign tumors of the jaw.

Basic knowledge requirements. To fully master the topic, the material from the following sections is to be revised:

Human morphology:

– topography-anatomical features of the facial bones;
– blood supply to the head and neck;
– innervation of the maxillofacial region;
– pathogistology of benign tumors of the facial bones.

Test questions and assignments in related disciplines:

1. List the bones involved in the structure of the maxillofacial region.
2. Anatomical features of the upper jaw.
3. Anatomical features of the localization of the teeth of the upper jaw in relation to the maxillary sinus.
4. Anatomical structure of the lower jaw.
5. Blood supply and innervation of the upper and lower jaws.

LEARNING MATERIAL

According to statistics, neoplasms and tumor-like processes of the oral cavity and maxillofacial region constitute about 20–25 % among tumoral diseases of other localizations. In the bones of the facial skeleton, in particular in the jaws, various tumors can occur as well as in other parts of the bone system. Some of them are formed from the jaw bone tissue elements, e. g. chondroma, osteoma, giant cell tumors, chondrosarcoma, osteogenic sarcoma; others from connective tissue, vascular, reticular, haematopoietic elements embedded in interosseous spaces, e. g. fibroma, myxoma, angioma, myelomas Ewing's tumors, eosinophilic granuloma, etc.

The main groups of benign tumors of the bones of the maxillofacial region are represented in the T. P. Vinogradova classification.

Vinogradova classification of primary bone tumors and their borderline processes

I. Odontogenic tumors
1. Cysts of the jaws
2. Ameloblastoma (adamanthinoma)
3. Odontoma
4. Cementoma
5. Epulis

II. Tumors of the cartilage tissue
1. Chondroma
2. Chondroblastoma
3. Chondromixoid fibroid

III. Osteogenic Tumors
1. Osteoclastoma (giant cell tumor)
2. Osteoid-osteoma (classical type)
3. Spongy osteoma; compact osteoma

IV. Tumors of connective tissue
1. Myxoma
2. Fibroid

V. Tumors of fatty tissue
1. Lipoma

VI. Tumors of vascular elements
1. Hemangioma
2. Hemangioendothelioma
3. Telangiectatic angioma

VII. Tumors of nervous tissue
1. Neurofibroma
2. Neurilemmoma

VIII. BORDERLINE PROCESSES (dysplastic diseases)
1. With benign cartilage tumors:
a) osteochondral exostose
b) chondromatosis of bones
2. With benign osteogenic tumors:
a) Braitsev-Liechtenstein fibrous dysplasia
b) deforming ostosis (Paget's disease)

As it can be seen from the classification, group III includes osteogenic conditions. According to T. P. Vinogradova the term "osteogenic" means "a derivative of bone tissue and forming bone tissue".

Methods of diagnosis of benign tumors of the facial bones

Currently, the following methods are used for the diagnosis of benign tumors of the facial bones:

– clinical data;
– X-ray diagnostics;
– radionuclide diagnostics;
– physical methods of diagnosis;
– morphological diagnostics.

Clinical data. In most cases, benign tumors of the facial bones are characterized by the scarcity of clinical manifestations, which prevents patients from seeking medical help. The starting point in the diagnosis of tumors can be the patient's sex and age. Precancerous formations are known to occur, as a rule, in persons over 50, more often in men than in women. Vascular tumors and tumor-like formations of the jaw bones predominate in the newborns.

Tumors of the jaws localized on the alveolar processes are recognized early. When localized in the jaw area, they develop asymptomatically over a long time.

Neoplasms located in the region of the angle and branch of the lower jaw, as well as tumors of the paranasal sinuses, are much more difficult to diagnose. In the region of the angle and branch of the lower jaw, the compact substance predominates over the spongy bone. Most of the bone here is covered by chewing muscles inside and outside, and therefore, tumors of this localization are detected much later than tumors of the body of the lower jaw. Deformation of the face becomes noticeable when the tumor destroys more than a half of the lower jaw branch. Sometimes, the tumor of the lower jaw resembles parotid neoplasm.

Intra-osseous tumors and tumor-like growths first affect the spongy substance, then cause thinning of the compact plate and deformation of the jaw body. The lower jaw is accessible for inspection and palpation throughout its entire length, which allows a good palpation of the tumor, but not at the early stages of its growth. In the process of growth of a neoplasm, the bone tissue of the lower jaw can become so thin that it leads to a pathologic fracture.

Tumors located on the orbit of the upper jaw can lead to a shift in the eyeball and diplopia. Squeezing of the nasolacrimal canal leads to tears. The most secretively developing tumors are located on the transverse surface of the upper jaw. Sometimes the first sign of the growth is a sense of obstruction when opening the mouth, due to the fact that the coronoid process rests against the tumor without any pain.

Deformation at the base of the nose or the medial wall of the orbit reveals a lesion of the frontal process of the upper jaw, resembling a cerebral hernia. Tumors arising in the zygomatic process and extending to the tubercle of the upper jaw can significantly weaken its strength.

In the area of the alveolar process of the upper jaw, a variety of benign tumors may develop: osteoma, odontoma, osteoblastoma, fibroids. During surgery, penetration into the maxillary sinus is possible, which requires manufacturing a protective plate in the preoperative period. In operations in the anterior part of the alveolar process of the upper jaw, penetration into the nasal cavity is possible. The oncoming fistulas are difficult to cure.

According to A. Solntsev and V. S. Kolesov, zygomatic bone is rarely affected by benign tumors. The authors observed a chondroma and an osteoma.

If a tumor is suspected, particular attention should be paid to the areas of regional lymph drainage. We should not forget about the possible changes of regional lymph nodes due to chronic nonspecific lymphadenitis caused by inflammatory processes in the oral cavity and throat.

X-ray diagnostics. This method, as a rule, applies only to tumors of the jaw bones and is an auxiliary method of research. At the present time, several positioning ways are used, making it possible to obtain an image of the affected area of bone tissue in the desired projection. X-ray signs of the neoplasm are more easily determined when it is localized in the lower jaw. Tumors of the upper jaw, and especially of the paranasal sinuses, are much more difficult to detect radioliologically. In this regard, computed tomography has been widely used for the diagnosis of tumors of the upper jaw and for the assessment of their distribution, which allows to obtain a layered image of individual layers of the growth.

This is the most informative method of all X-ray methods, which allows to obtain an image of all types of tissues (bone, cartilage, muscle, etc.); to see the image not only of the organ under examination, but also of other organs and tissues that are on this “edge” and to determine their shape, size, topographic relationship; to match the images of transverse sections and obtain a longitudinal image of the organ; to zoom in the pathological focus and conduct precise measurements of the area under investigation; to get a clear image of the tissues of different density.

Nuclear magnetic resonance computed tomography (NMR CT) allows obtaining additional information on the state of the molecular nuclei of the substance under study and visualizing the object at a qualitatively higher level, as well as conducting research in any plane. This makes it possible to obtain

voluminous information not only about the pathological focus, but also about the blood vessels, lymph nodes, the relation of the tumor to the surrounding healthy tissue.

The need for contrast X-ray examination occurs only with tumors of the paranasal sinuses and salivary glands. The essence of the method lies in the artificial contrasting of the object due to its low radiographic density. For contrasting, they use oily (iodolpol) or water-soluble (urotrust, urographine, verophin, cardiotrastic, triiodtrast) radiocontrast preparations.

Radionuclide diagnosis consists in the introduction into the patient of special indicator substances able to selectively accumulate in the organs affected by the pathological process. Indicator substances are labeled with radioactive nuclides, which are *gamma* and *beta* emitters. The method of clinical radiometry allows the measurement of the accumulation of a radioactive nuclide in a pathological focus compared to the symmetrical healthy area. Radioactive phosphorus and calcium are used to diagnose bone tumors.

Among the physical methods of diagnosis of benign tumors of the jaws, electrodontodiagnostics is widely used, based on the study of the reaction of the tooth tissues to electrical stimulation. The method makes it possible to determine the viability of tooth tissues, so it is used to diagnose neoplasms of the mandible and paranasal sinuses, in which the electrical excitability of the teeth can be disturbed.

Morphological diagnostics. The most reliable method of diagnosing tumors and tumor-like formations is histological. At present, the role of morphological studies is increasing due to the introduction of more advanced methods of biopsy and the expansion of surgical interventions. Detailed morphological characteristics of the neoplasm provide data for the diagnosis, treatment method, and the extent of surgical intervention (N. A. Krayevsky et al., 1982). Biopsy of the treatment dynamics allows to monitor its effectiveness.

Biopsy is a microscopic examination of a life-time tissue or cell material for diagnosis and treatment (A. I. Rakov et al., 1982). Microscopic examination involves not only pieces of tissue removed by surgery, but also punctures, scrapings, excreta and secreta.

The following types of biopsy are used to diagnose tumors and tumor-like processes in the maxillofacial region: excision, incision, puncture, trepanobiopsy and methods of cytological examination of punctata, scrapings, print smears, secreta and excreta (aspiration biopsy) (I. M. Fedyaev, I. M. Bayrikov et al. “Malignant tumors of the maxillofacial region”, 2000).

Tumors of cartilaginous tissue

Chondroma is a benign tumor consisting of cartilaginous tissue, quite rare in jaw bones. A. A. Kolesov divides chondroma of the jaw bones into two groups: 1) endochroma is chondroma located intraoossally; 2) echondroma is located on the outside of the jaw and grows exophytically.

Pathogenesis. B. I. Migunov connects the development of the mandibular endochondroma with the remnants of the mekkelia cartilage. According to K. Thoma, the majority of the jawbone chomdroms is of embryonic origin. Ch. Geshickter et Copeland suggest that the source of chondroma may be foci of physiological bone formation.

Chondroma of jaw bones is more often observed in middle-aged, even elderly people (A. Evdokimov, G. A. Vasiliev, A. A. Kolesov). In most cases, chondroma develops in women and is localized on the mandibular median line. On the lower jaw, it can be found in the thickness of the condylar processes and in the retromolar region.

Clinic. Chondroma may have different size and shape, cartilaginous consistency, tuberosity; when being removed, a fibrous capsule may be revealed. The tumor grows slowly, without causing pain and any other disorders. Pain appears with a large tumor size, paresthesia, dental mobility and displacement, and deformation of the face. The tumor is usually covered with an unmodified coat. If it is located under the skin, then the latter is also unmodified. On palpation, the tumor is painless, of a dense consistency, with bumpy or smooth surface and the relatively clear borders. The tumor is not related to the teeth, but the roots of the teeth affected by the tumor are subjected to resorption. Localized on the upper jaw, chondroma can spread to the malar spine and the malar bone, causing a marked deformation of the face. The regional lymph nodes in patients with chondroma do not tend to increase in size.

Echondromas are mainly found on the upper jaw (A. A. Kolesov et A. A. Kandsky). They can be localized both on the alveolar process, and in the thickness of the bone. At large sizes, the tumor can germinate into the nasal cavity, hard palate, maxillary sinus, or the orbit.

Enchodroma (central, intraosseous chondroma) can be located on the upper and lower jaws. As the tumor grows, toothache, mobility and displacement of teeth appear. On palpation the tumor is motionless and has a dense consistence. The overlying skin and mucous are not modified in color. The tumor is slow to grow.

Radiological image. Determined is the enlightened center of an irregular or rounded shape, sharply delimited from unmodified bone, sometimes with the resorption of the roots of the teeth located in the area of tumor.

Macroscopically, chondroma has a pearlescent hue, which is well revealed on the bumpy surface of the echondroma or when the tumor is being incised.

Microscopically, chondroma is constructed from the hyaline cartilage with the interlayers of connective tissue containing vessels; the main substance contains cartilaginous cells, often with two cores, surrounded by a capsule.

Differential diagnosis of chondroma should bemade with many other bone lesions: juvenile osteochondral cartilage exostoses, osteoma; enchondroma can be taken for osteoclastoma or fibrotic dysplasia. In most cases, the final diagnosis is established by histological examination.

Treatment for chondroma is surgical, i. e. radical removal of the tumor within a healthy tissue. It should be remembered that chondroma often recurs and can become malignant. To prevent recurrence of echondroma, partial bone resection is advisable.

Chondroblastoma remains poorly understood and rarely found. In 1931, Codman first described this type of tumor called "epiphyseal chondromatous giant cell tumor". In connection with the simultaneous combination of chondroblasts and giant cells (osteoclasts) in the tumor, T. P. Vinogradova expressed her viewpoint on the nature of chondroblastoma. She referred it to intermediate forms of tumors between the chondroma and osteoclastoma.

Clinic. Unlike chondroma, chondroblastoma is more common in young people with incomplete epiphyseal growth, i. e. aged 10 to 20 years, and sometimes even younger. The neoplasm also manifests as chondroma.

On X-ray the tumor has a number of characteristics. There are small oval or rounded single lesions 2–5 mm in diameter, located eccentrically in relation to the bone; the cortical layer is thinned and rises above the tumor; a periosteal reaction is possible. The background of the hearth differs from the non-homogeneity of the structure, since the cartilaginous tissue is stained with inclusions of bone.

Histologically, the tumor consists of a cartilaginous base, including cells of the formed hyaline cartilage and embryonic immature cells chondroblasts.

Differential diagnosis should be carried out with bone tumors of other types: osteoclastoma, osteogenic sarcoma, and osteochondroma. It is especially difficult to differentiate the malignant form of chondroblastoma. In a benign chondroblastoma, detection on the X-ray of a periosteal reaction may indicate an osteogenic or cartilaginous sarcoma.

The treatment is only a surgical removal of affected areas of the bone within a healthy tissue.

Osteoclastoma. So far, there have been various names given to osteoclastoma, e. g. giant cell tumor of the epulide type, brown tumor, giant cell sarcoma, osteoblastoclastoma (A. V. Rusakov (1959), and local fibrotic osteodystrophy. The term "giant cell tumor" is adopted in the International Histological Classification of Primary Tumors and Tumor-like Bone Diseases.

In the etiology of this tumor, according to a number of authors, a significant role is played by bone trauma. Osteoclastoma is a benign osteogenic tumor which occurs in the jaw bones. The tumor develops mainly in young people, more often in women of 11–30 years (A. A. Kolesov, A. I. Evdokimov). According to Yu. I. Bernadsky (1970), osteoclastoma accounts for 20.7 % of facial bone tumors.

Osteoclastoma can be located on the periphery of the bone and in the thickness of bone tissue. When localized on the alveolar process of the jaw, it is considered as a giant cell epolide. In the lower jaw, the tumor is most often localized in the region of premolars and molars, in the premolar region of the upper jaw. However, the malar bone is a rarely affected.

Clinic. A uniform thickening appears in the lower or upper jaw, usually painless and unnoticeable for the patient. The tumor grows for 3–10 years, sometimes faster. On palpation, its dense sites alternate with softened ones. Its shape is convex, domed, sometimes the walls of the jaw are thinning, manifesting as Dupuytren symptom (crepitation). The teeth in the affected area are mobile, their electrical excitability is lowered, resorption of the roots of the teeth by $^1/_3$ of the length is noted in the lesion focus. Mucous over the tumor is not altered, or slightly anemic, the venous network of the mucous membrane in the tumor region can be expanded. In the presence of an odontogenic inflammatory process, the signs of acute inflammation prevail.

On the basis of clinical and X-ray data and the morphological picture, osteoclastoma can be of cellular, cystic, or lytic forms (A. A. Kolesov, 1972).

Cellular osteoclastomas are characterized by very slow development and develop more commonly in mature and elderly people. On examination, a dense swelling with a tuberous surface is determined. It is not possible to clinically distinguish the tumor from healthy bone. The jaw is often spindle-shaped. The teeth, located in the area of the tumor, rarely change their position. Electroexcitability of the pulp of intact teeth is not disturbed. The mucous membrane covering the tumor is somewhat anemic.

In the *cystic form* of osteoclastoma, the first symptom in most cases is toothache. On palpation, individual tumor sites are malleable when pressed, *aka* the parchment crunch symptom.

The lytic form is rare, more common in childhood and adolescence, and accounts for 10 % of all jaw osteoclastomas. The development of this form of osteoclastoma occurs rather rapidly. In a number of cases, the first sign of a developing tumor is pain. With thinning of the cortex, along with pain at rest, palpation is painful. The venous network of the mucous membrane covering the tumor is enlarged. Teeth are often displaced and become mobile, the electroexcitability of the pulp is reduced. In the area of lesions, there may be pathological fractures of the jaw; when localized on the upper jaw, its germination is possible into the maxillary sinus, nasal cavity and other facial bones. Puncture reveals brown or yellowish liquid, which is associated with the disintegration of erythrocytes and the formation of hemosiderin, sometimes with blood. The punctate does not include the cholesterol crystals that are commonly found in cysts.

Radiographically, in the cellular form of the tumor, the shadow of many small and larger cavities or cellular formations separated from each other by bony septa of various thickness is noted in the place of the lesion. Reactions from the periosteum are not observed. The picture is in many respects similar to the X-ray picture of ameloblastoma.

The cystic form on the roentgenogram resembles the odontogenic cyst of the jaw and ameloblastoma. The cystic form of ameloblastoma is characterised by its border with the bone, which has fine-fanciful outlines in the form of extremely small coves.

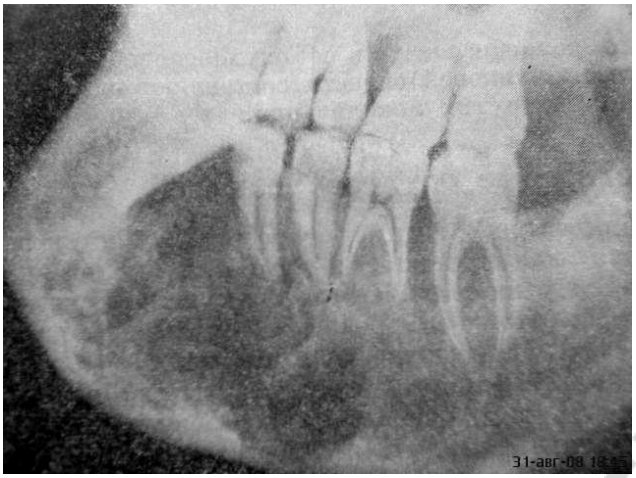

Fig. 1. X-ray image of the cellular form of osteoclastoma

In the lytic form of osteoclastoma, the tumor gives an unstructured focus of enlightenment.

Macroscopically, the tumor has a motley structure: areas of brown color alternate with areas of red-grey color and yellowish fields of necrosis. Single or multiple small cavities are distinguished in the thickness of the tumor containing bloody brown liquid. There are foci of ossification.

Microscopically, is determined a large number of small, slightly elongated cells with a rounded nucleus, similar to osteoblasts in osteoclastoma, with massive accumulations of giant multinucleate cells (osteoclasts).

Differential diagnosis. Osteoclastoma of cystic and cellular forms must be differentiated with ameloblastoma and radicular cyst; the lytic form of osteoclastoma with osteogenic sarcoma (in contrast to osteolytic sarcoma, thinning and swelling of the cortical layer of the jaw is noted in osteoclastoma,) and fibrous osteodysplasia (slow growth and preservation of the continuity of the cortical layer of the jaw are characteristic on the X-ray diffraction chart); fibromyxoma; central jawbone fibroma.

The treatment of osteoclastoma of the jaws is surgery. In cystic and cellular forms, a thorough scraping of the lesion can suffice. If the tumor occupies significant areas of the jawbone, it is possible to perform a lower jaw resection, if necessary with a one-stage osseous plasty. In the lytic form, partial jaw resection is more frequently used without disrupting the continuity of the mandibular bone (continual resection) or resection of the jaw fragment with one-stage bone plasty. Radiation therapy does not provide a sufficient therapeutic effect. However, it is prescribed to patients with total contraindications to surgery due to their general status. Short-focus X-ray therapy, remote gamma-therapy, high-energy bremsstrahlung are commonly used. The average dose of irradiation varies between 30–50 Gy/kg. The prognosis of treatment is favorable, but the possibility of malignancy and metastasis of the tumor with a benign neoplasm is not excluded. Wrong treatment tactics may result in relapses of the tumor growth.

Osteoma. It is a benign osteogenic tumor of mature bone tissue, accounting for 15.1 % of all tumors of the jaw bones (A. M. Solntsev, V. Kolesov).

Pathogenesis. A number of authors recognize the tumor nature of osteoma (N. N. Petrov et al.), others (A. V. Rusakov, T. P. Vinogradova, I. G. Luganova et al.) consider the pathogenetic basis of their development embryonic disorders in bone formation.

Clinically, there are the central osteomas, i. e. located in the thickness of the bone, and peripheral ones, i. e. exostoses. The growth of osteoma is very slow, the tumor remains undetected for a long time. Sometimes it is discovered by chance during X-ray examination. The first clinical sign of osteoma is usually bone deformation. Osteoma of the condylar process of the lower jaw can make it difficult to move. The tumor compression of the neurovascular bundle of the lower jaw causes paresthesia or neuralgic pain. Osteoma of the upper jaw can obstruct nasal breathing, and if the lower edge of the eye and the bottom of the orbit are damaged, it causes a visual disturbance. If the tumor is localized on the alveolar processes, difficulties arise in prosthetics of the teeth.

Osteoma is defined as a single smooth or bulging protrusion of a dense consistency, painless with clear boundaries. The skin or mucosa covering the osteoma is usually unmodified in color and freely folded. This tumor does not suppurate.

An important factor in the **diagnosis** of the tumor belongs to the X-ray methods. On the roentgenogram, the central osteoma is defined as a focus of intense darkening, usually homogeneous, round or oval, with distinct borders of very variable dimensions. The tumor is not connected to the teeth, but sometimes it adjoins them, similar to odontoma. The peripheral osteoma on the roentgenogram has the form of a limited protuberance with clear even contours. Sometimes it is a spine-shaped growth of the bone, which extends to the surrounding tissues.

According to the structure, osteomas are divided into the following types:

1) compact, consisting of a cortical substance of the bone with complete absence of bone marrow and almost complete lack of vascular channels (Fig. 2, 3);

2) spongy, consisting of porous spongy substance;

3) soft, with wide medullar cavities.

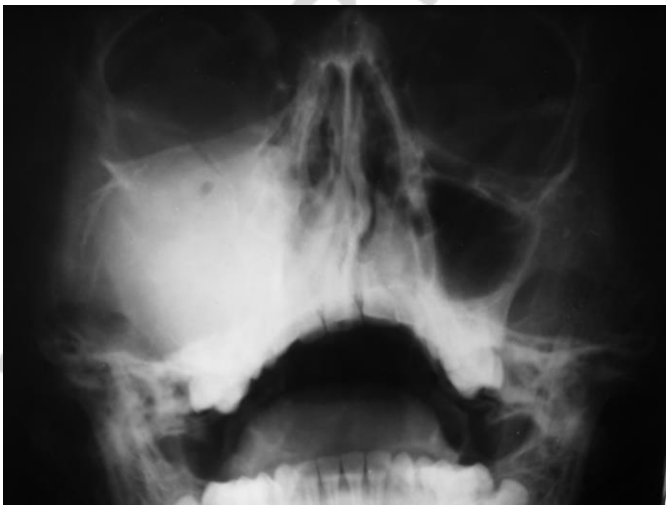

Fig. 2. Compact osteoma of the upper jaw with germination into the maxillary sinus

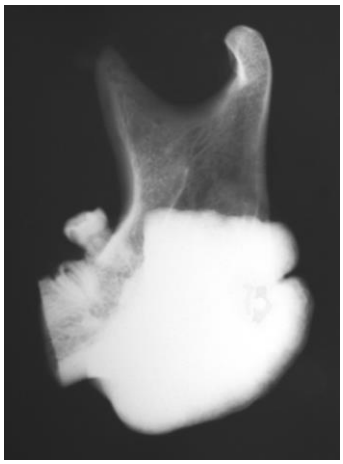

Fig. 3. Compact osteoma of the angle of the lower jaw

Macroscopically, compact osteoma has the appearance of a dense bone tumor, short of vessels, which cannot be pressed with a knife. Spongy osteoma is a full-blooded crumbling soft bone tissue.

Microscopically, compact osteoma does not have the typical osteogenic structure which is observed in the cortical substance of the bone; though there is a small number of narrow, randomly scattered Haversian canals. Spongy osteoma does not have Haversian canals; bony barbs of a bizarre shape are irregularly distributed, bone marrow spaces occupy large areas, there are wide interlayers of cell-fibrous tissue.

Differential diagnosis of osteoma should be carried with odontoma, osteoid osteoma, reactive hyperostosis, fibrous dysplasia, and osteoclastoma.

Surgery is the only **treatment** of osteoma, when the tumor is removed within the healthy bone. The operation is indicated only in cases of pain, functional disturbance or aesthetic inconvenience caused by the tumor. Osteoma and non-tumorous exostoses must be removed as pre-prosthetic preparation of the oral cavity. Post-surgery tumor recurrence has not been reported.

Some authors consider **osteoid-osteoma** to be a kind of osteoma. However, these tumors have their own characteristics. Osteoma usually does not cause subjective disorders, while osteoid-osteoma is accompanied by pain, often intense. **On the roentgenogram**, osteoma is usually defined as a foci of homogeneous darkening with clear boundaries. In osteoid-osteoma, the focal point of destruction with fuzzy boundaries is distinguished on the roentgenogram, surrounded by a rim of sclerotized bone tissue. Unlike osteoma, the contours of reactive hyperostoses on the radiograph are not even and clear.

Macroscopically, the tumor has a spherical or ovoid shape, having a grey-red color on the cut. In the central section it is loose, the density increasing towards the periphery.

Microscopically, the tumor consists of a large number of anastomosing small osteoid and slightly calcified bone beams of varying degrees of maturity. The spaces between the bony beams are abundantly vascularized and filled with fibrous tissue, where in places clusters of multinucleated giant cells like osteoclasts (Yu. N. Soloviev, 1971), as well as mononuclear cells such as osteoblasts, are found.

Differential diagnosis of osteoid-osteoma is carried out with chronic osteomyelitis, Brody abscess, osteoma and osteogenic sarcoma.

Treatment of osteoid-osteoma is surgery. The tumor is removed within the healthy tissue along with the surrounding sclerotized bone. Tumor recurrences are very rare, according to A. A. Kolesov.

Non-odontogenic non-osteogenic tumors of jaws

Fibroma. It is a rare tumor of a non-osteogenic nature. According to A. A. Kolesov (1969), intraosseous fibroma is responsible for 2 % of all primary tumors of the jaws. Intraosseous fibroids of the jaws are rare, and therefore, poorly

studied diseases. Morphologically, the fibroid consists of connective tissue elements and does not produce bone tissue.

The clinical picture of fibroids of the jaws is nonspecific. The tumor grows slowly, asymptomatically, may affect both jaws. It can be detected accidentally by X-ray examination of the jaw. Having reached a large size, the fibroid deforms the jaw. Speech may be disturbed and food intake may be difficult. In some cases, the growth of the tumor can be accompanied by aching pains. It can take months to several years to develop from the first symptoms till bringing the patient to the doctor. Infection of fibroids occurs extremely rarely. Extending beyond the bone of the jaw, the fibroid forms a protrusion under the unmodified mucous membrane of the oral cavity or the skin in the form of a hemispherical formation, which is firmly welded to the bone. Its surface is smooth, the boundaries are clear. On palpation, the tumor has a dense painless consistence. The tumor involving the alveolar process of the jaw can cause displacement of the teeth.

The radiological image of the centrally located jaw fibroma in typical cases is represented by the central focus of bone destruction, round or ellipsoidal in shape, with quite clear boundaries; the focus has an unstructured homogeneous appearance.

The final diagnosis of central intraosseous fibroma is based on the clinical-radiological and histological comparison.

Histologically, there are three morphological varieties of fibroma (A. A. Kolesov):

– simple fibroma, which is characterized by the presence of coarse fibrous connective tissue with a moderate content of cellular elements;

– lytic fibroma is characterized by fine-focal deposits of calcium salts;

– odontogenic fibroma is characterized by the presence of residues of the tooth-forming epithelium (V. F. Ermolov).

Differential diagnosis should be performed with sarcoma (especially in childhood), osteoclastoma, fibrotic dysplasia, adamanthinoma.

The treatment of true intraosseous fibroids of the jaws is only surgical (the tumor is removed within the healthy tissue).

Myxoma of the jaw bones is a rare disease. The intraosseous myxoma of the jaw constitutes about 1 % of all primary tumors and tumor-like formations of the facial bones (A. A. Kolesov, 1969). The tumor is localized in the lateral sections of the upper and lower jaws, more often on the upper jaw. Myxoma is found in childhood and adolescence, as well as in adult men and women.

Pathogenesis. Myxoma develops from a mucosal tissue containing mucin and Wharton's jelly. Myxoma can be primary and secondary. The latter is the result of a mucous transformation of fibroids, lipoma, sarcoma, etc. In this regard, they distinguish myxoma, myxolipoma, myxofibroma, myxochondroma, myxosarcoma.

Clinic. Myxoma is a dense painless tumor with a smooth surface, slowly growing and often reaching considerable dimensions. It is palpated as a dense,

painless node with a smooth surface, covered with unmodified mucosa. The teeth are sometimes loosened and displaced. On the lower jaw, in the case of tumor invasion into the neurovascular bundle, Vincent's symptom is determined. On the upper jaw, the tumor can germinate into the maxillary sinus and into the nasal cavity.

Macroscopically, myxoma is a rounded elastic formation in the form of a single knot, without a shell, with no clear boundaries from the surrounding tissues. On a cut it looks like a gelatinous translucent mass with many small cysts filled with mucus bloody fluid.

Microscopically, in myxoma are found stellar spindle-shaped anastomosing cells, located in a semitransparent mucin-containing basic substance that abounds in blood vessels, collagen and argyrophilic fibers. The growth has no capsule.

X-ray image has a number of characteristic features. The tumor is a focus of destruction of the jaw bone tissue of a round or oval shape. It can be located centrally or eccentrically. The cortical layer of bone is thinned from the inside, there are bayonet protrusions. The boundaries of the tumor are not clear. Against the backdrop of the lesion focus, bone bunches can be observed in various shapes and thickness. In some areas, the tumor looks like a cyst.

Usually, the clinical and radiological picture is not pathognomonic for myxoma, as the same symptoms can occur in the cystic osteoclastoma, adamantinoma, radicular cyst and enchondroma. Therefore, in most cases the diagnosis requires histological examination.

Differential diagnosis of myxoma is carried with adamantinoma, osteoclastoma, and radicular cyst.

The treatment is exclusively surgical. Radical removal of the tumor is indicated by subperiosteal resection of the jaw with a one-stage osseous plasty. Post-surgery relapses have not been reported.

TEST QUESTIONS

1. Name the classifications of non-odontogenic tumors used in the practical work of maxillofacial surgeons and dentists.
2. List the most informative methods for diagnosing benign tumors of the facial bones.
3. List the types of biopsies used for diagnostic purposes.
4. Give the definition of non-odontogenic tumor.
5. Name the tissues from which chondroma develops.
6. Specify the typical sites for chondroma localization.
7. What are the types of osteoclastoma depending on its localization?
8. What are the possible options for surgical treatment of osteoclastoma, depending on its size?
9. What is the difference between the cystic form of osteoclastoma and ameloblastoma?
10. What is the characteristic clinical sign of osteoid-osteoma?

11. Describe the radiologic image of osteoid-osteoma.
12. Describe the structure of fibroids.
13. What is the distinctive feature of the structure of myxoma?

Answer key

1. Vinogradova Classification of primary tumors of bones.
2. Orthopantomography, zonography, radiovisiography, computed tomography, magnetic resonance imaging (NMR CT).
3. Excision; incision; puncture; trepanobiopsy.
4. These are tumors formed from the tissue elements of the jaw bones (chondroma, osteoma, giant cell tumor) or from connective tissue, vascular, reticular, haematopoietic elements embedded in the interosseous spaces (fibroma, myxoma, angioma, etc.).
5. Of cartilaginous tissue.
6. On the upper jaw along the median suture, on the lower jaw in the thickness of the condylar process and in the retromolar region.
7. Central tumor in the thickness of jaw bones; peripheral tumor, i. e. giant cell epulis.
8. In a significant size of growth resection of the lower jaw, if necessary with a one-stage osseous plasty. Partial resection of the jaw is also possible without disrupting the continuity of the mandibular bone or resection of the jaw fragment with one-stage osseous plasty.
9. The border of adamantinoma with bone has small-crenate contours in the form of extremely small coves. Cystic osteoclastoma resembles an odontogenic cyst and has a clear border with the bone.
10. Aching pain, which intensifies at night.
11. An irregular rounded focus of destruction, surrounded by a sclerotized bone.
12. Of connective tissue elements; it does not produce bone tissue.
13. Develops from a mucous tissue containing mucin.

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