Surgical treatment of TMJ diseases

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LECTURE PLAN

- RELEVANCE OF THE TOPIC
- FUNCTIONAL ANATOMY OF TMJ
- EPIDEMIOLOGY OF TMJ PATHOLOGY
- RESEARCH METHODS
- PATHOGENESIS OF TMJ DISEASES
- MANAGEMENT PLAN FOR PATIENTS WITH TMJ DYSFUNCTION

Actuality

- Difficulties in diagnosis

- Difficulties in treatment

- Diversity and complexity of the clinical picture

- Interdisciplinary integration

"Washington Post" on May 7, 1996 in the "Health News" section reports:

"...medical science is not sure how to treat pain in the lower jaw,

because the violation was not accurately diagnosed or described.

And no one is sure whether it is necessary to consult a dentist or not

to other doctors, or to those, and to others."

Epidemiology

ACCORDING TO OUR DATA - 17.1%, of them, 35% needed orthopedic treatment.

IT OCCURS 7-8 TIMES MORE OFTEN IN WOMEN.

ANATOMY of TMJ

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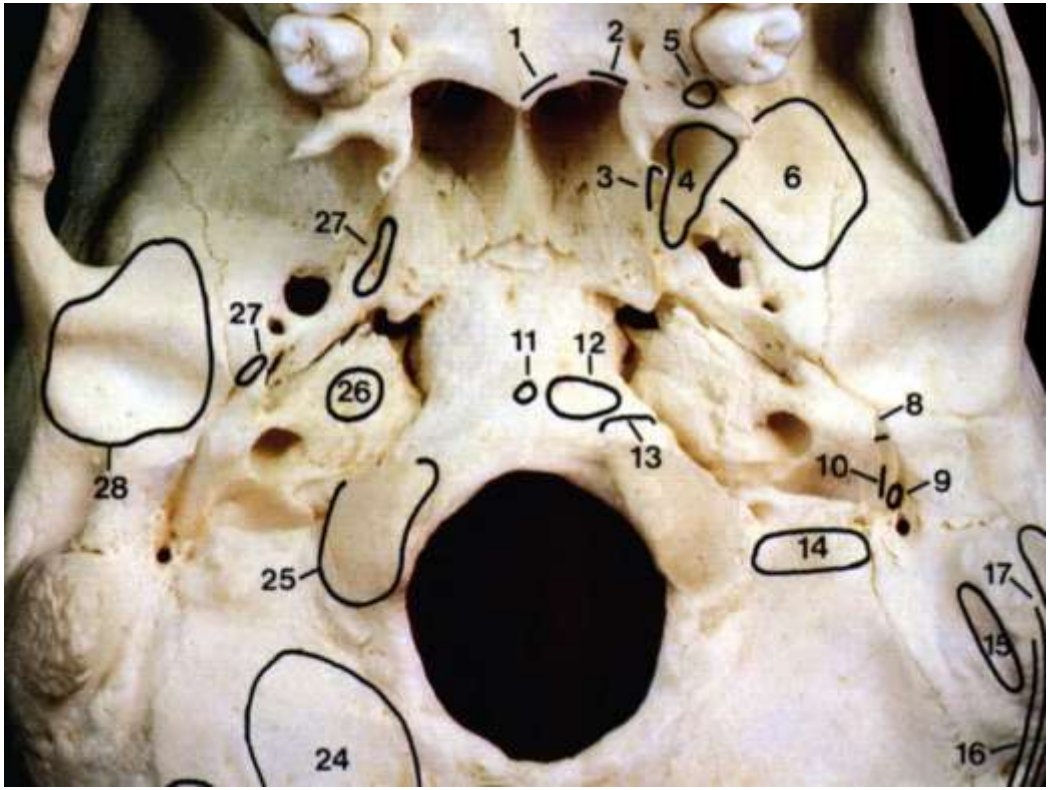
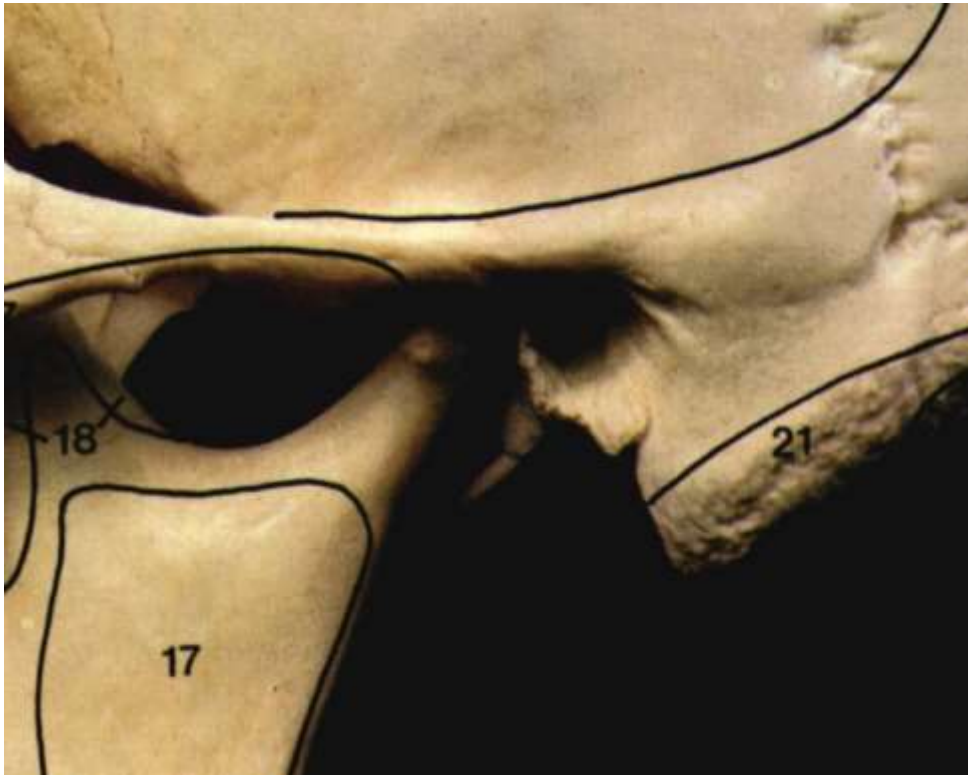


ANATOMY of TMJ



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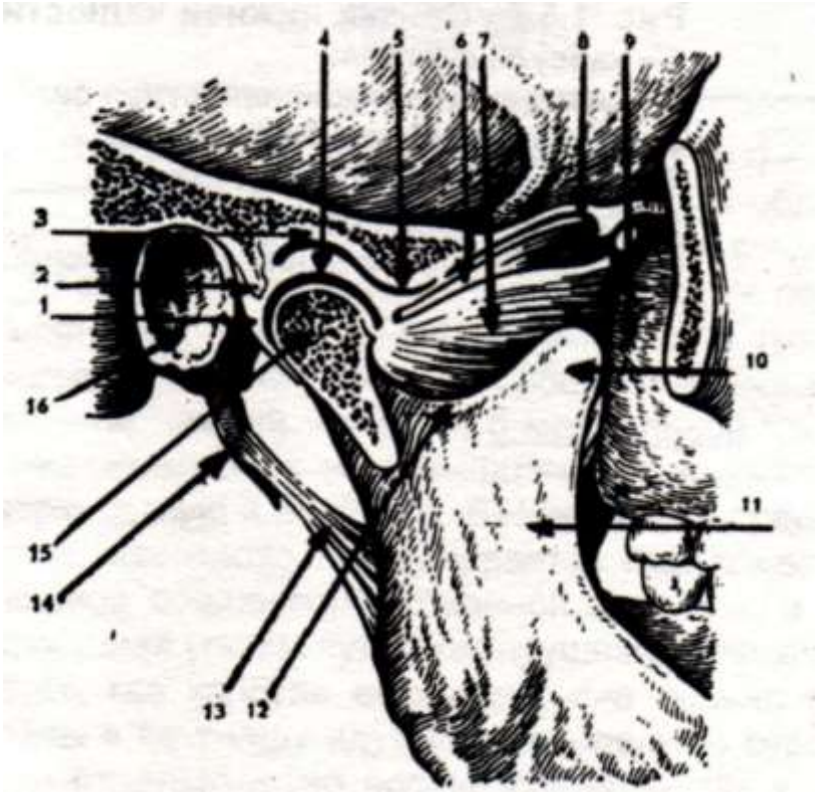

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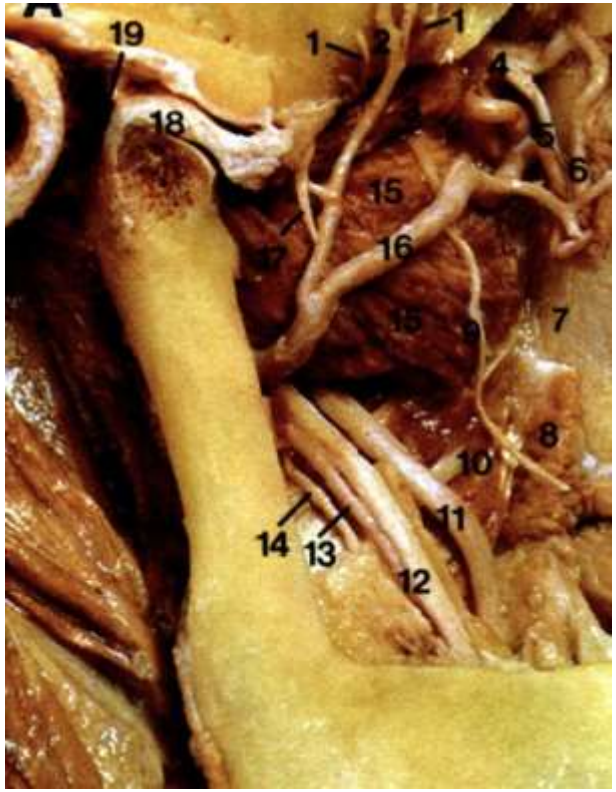

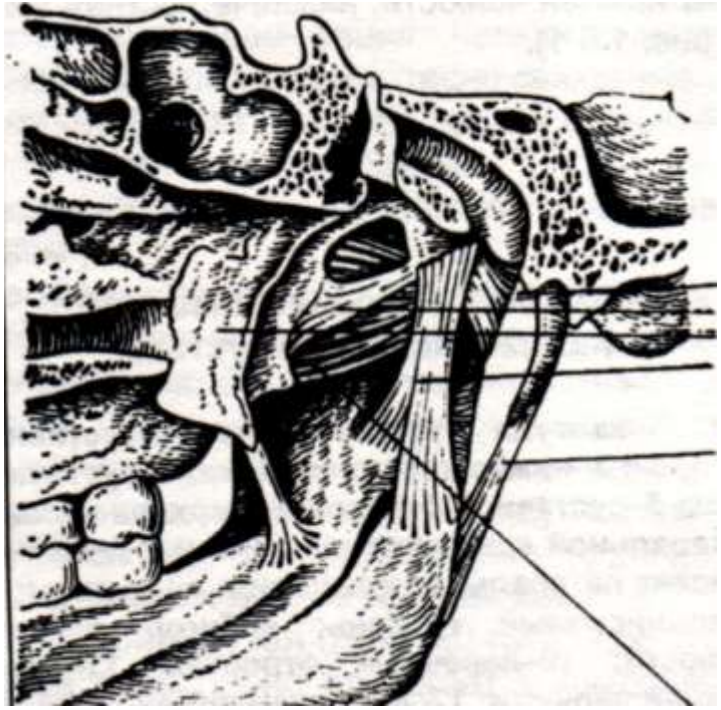

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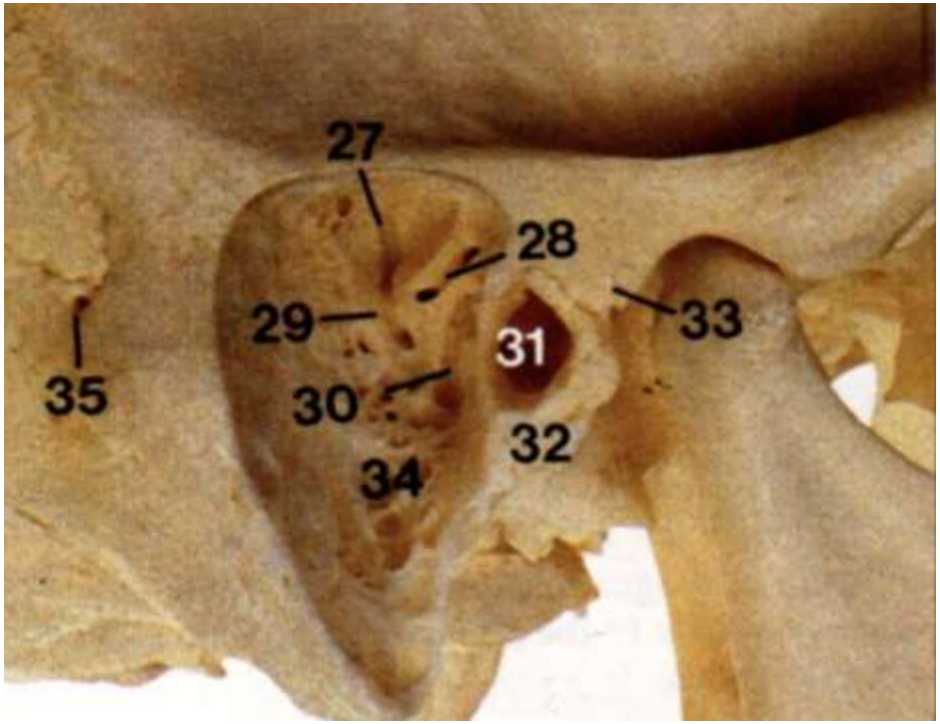


Classification (V.A. Khvatova (1982)

- ARTHRITIS – acute and chronic;
- ARTHOSIS

- sclerosing and deforming;

- in the chronic stage and the stage of exacerbation

- MUSCLE-JOINT DYSFUNCTIONS;
- ANKYLOSIS;
- TUMORS

Classification (Y.A. Petrosov (1982)

- DYSFUNCTIONS

- neuromuscular;

- occlusal and articulating;

- usual sprains.

- ARTHRITIS

- acute (infectious, allergic, traumatic)

- chronic (only systemic and infectious allergic)

- ARTHROSIS

  - post-infectious, post-traumatic, exchange)

- ANKYLOSIS
- COMBINED FORMS OF DISEASES
- NEOPLASMS AND DYSPLASIAS

ARTHRITIS

(a synonym is osteoarthritis)

inflammatory processes

in TMJ

ETIOLOGY:

– more frequent for people of young and middle age;

– local infection (parodontitis, gingivitis, stomatitis, otitis, osteomielitis of jaws and other);

– general infectious diseases (ARD, flu, pneumonia, dysentery, tuberculosis, syfilis and other);

– allergic diseases, traumatic influences et cetera;

– supercooling, overburning;

– a change is in the endocrine and nervous systems;

– presence of hearths of chronic infection (especially in the cavity of mouth)

An infection in a joint spreads hematogenic and contact ways.

CLINIC OF ACUTE ARTHRITIS:

– has the sharp beginning;

– characterized by sharp pains in TMJ, which increase at the least motions a lower jaw and irradiation in the area of face and head;

– pains are permanent, only at rest of the lower jaw they diminish;

– sharp limitation appears at opening of mouth, and a lower jaw at motion is displaced toward a sick joint;

– at pressure on a chin pain in a sick joint increases sharply, even at the closed mouth;

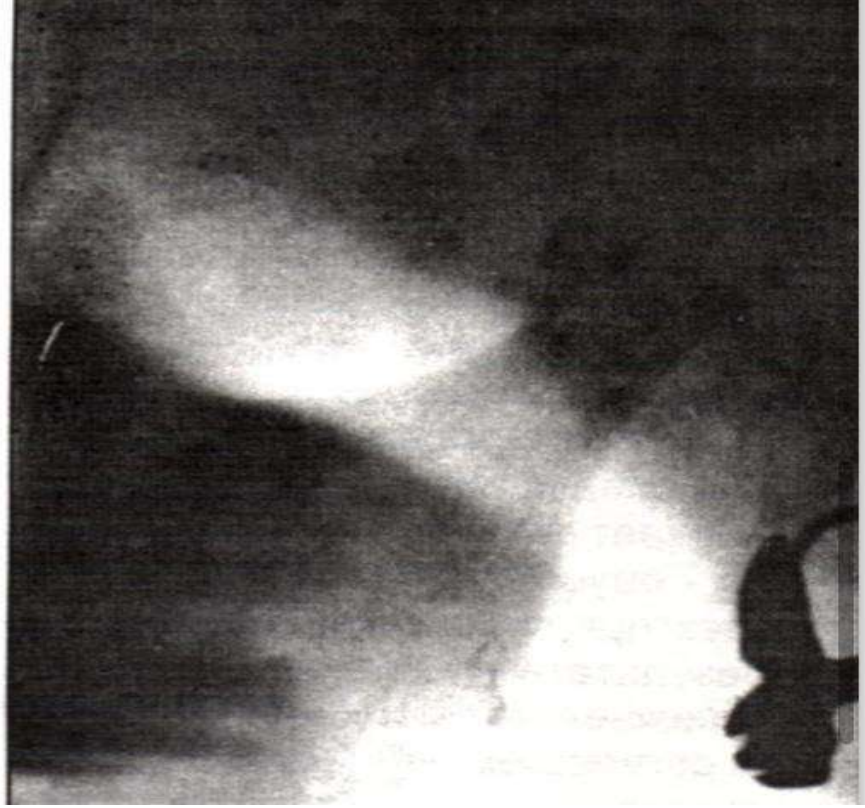
– the oedematosus and infiltration of soft tissue appears ahead of ear antilobium, skin can be hyperemic.

SEROSAL ARTHRITIS - a serosal exsudate appears in the cavity of joint.

FESTERING ARTHRITIS - a festering (purulent) exsudate appears in the cavity of joint.

PSEUDORHEUMATISM (rheumatoid) - the bilateral damage of TMJ is characteristic.

CONTACT ARTHRITIS - the hemilesion of TMJ is characteristic.



HEALTHY MAN

PATIENT WITH ARTHRITIS

X RAY CHANGES ARE NOT PRESENT

DIFFERENTIAL DIAGNOSTICS

INDUCTED WITH THE FOLLOWINGS DISEASES:

– arthrosis;

– by pain dysfunction of TMJ;

– by sharp otitis;

– by the break of condylar sprout of lower jaw;

– osteomyelitis of upper jaw in area of molars;

– myositis;

– inflammatory contracture of masseters;

– by a trigeminal neuralgia;

– by the ganglionitis of ear knot.

CLINICAL PICTURE OF CHRONIC ARTHRITIS

– Lasts from a few months to few years.

– Characterized the moderately expressed pains in TMJ, which are more frequently provoked supercooling, after the protracted talk, during eating (hard).

– Joint stiffness is marked at mornings and at the end of day.

– Stiffness in a joint at mastication or talking.

– Limitation of opening of mouth is observed, mainly, in the period of exacerbation.

– Pain in the area of ear antilobium.

– A paresthesia or giperesteziya of skin of this area, crunch, is in a joint.

– At intensifying of the dysfunction appear more clinical simptoms, characteristic of sharp arthritis.

TREATMENT OF ARTHRITIS

- to create rest in a joint, limiting the function of lower jaw.

- a chin lay on - parietal gauze bandage or head little cap with elastic traction to the chin sling and simultaneously rubstrip in 5-10 mm thick between large cheek-teeth (for the prophylaxis of acampsia).

- surgical interference *(synosteotomy) is rotined at presence of festering exsudate in the cavity of joint.*

TMJ X-ray of a patient with chronic arthritis.

There is narrowing of arthral crack in its back department.

IN THE SHARP STAGE WE PRESCRIBE:

- antimicrobial medicines,
- antiinflammatory medicines (Indomethacinum, ortofen, naproksen, piroksikam and other),
- anodynes,
- antihistamines,
- sedatives,
- physical therapy treatment.

After the removal of the sharp inflammation orthopaedic treatment is conducted (on testimonies).

Degenerative Joint Disease (Arthrosis, Osteoarthritis)

DJD includes a variety of anatomic findings, including irregular, perforated, or severely damaged disks in association with articular surface abnormalities, such as articular surface flattening, erosions, or osteophyte formation. The mechanisms of TMJ degenerative diseases are not clearly understood but are thought to be multifactorial.

Current concepts of DJD incorporate three possible mechanisms of injury: (1) direct mechanical trauma, (2) hypoxia reperfusion injury, and (3) neurogenic inflammation

Mechanical trauma may be a result of significant and obvious trauma to the joint or much less obvious microtrauma, such as excessive mechanical loading. The excessive stress produced in the joint can lead to molecular disruption and the generation of free radicals, with resulting in oxidative stress and intracellular damage. Excess loading can also affect local cell populations and reduce the reparative capacity of the joint.

The hypoxia-reperfusion theory suggests that excessive intracapsular hydrostatic pressure within the TMJ may exceed the blood vessel perfusion pressure, resulting in hypoxia.

This type of increased intracapsular pressure has been clearly demonstrated in patients during clenching and bruxing. When the pressure in the joint is decreased and perfusion is reestablished, free radicals are formed. These free radicals may interact with other substances in the joint (e.g., hemoglobin) to produce even more damage.

Neurogenic inflammation results when a variety of substances are released from peripheral neurons. It is hypothesized that in cases of disk displacement the compression or stretching of the nerve-rich retrodiscal tissue may result in release of proinflammatory neuropeptides. The release of cytokines results in the release and activation of a variety of substances including prostaglandins, leukotrienes, and matrix-degrading enzymes. These compounds not only have a role in the disease process but may also serve as biologic markers that may help to diagnose and eventually treat joint pathology. It must be emphasized that it is impossible to predict the progression of joint pathology. Patients with DJD frequently experience pain associated with clicking or crepitus, located directly over the TMJ. Usually, an obvious limitation of opening is present, and symptoms usually increase with function. Radiographic findings are variable but generally exhibit decreased joint space, surface erosions, osteophytes, and flattening of the condylar head. Irregularities in the fossa and articular eminence may also be present.

Myofascial Pain

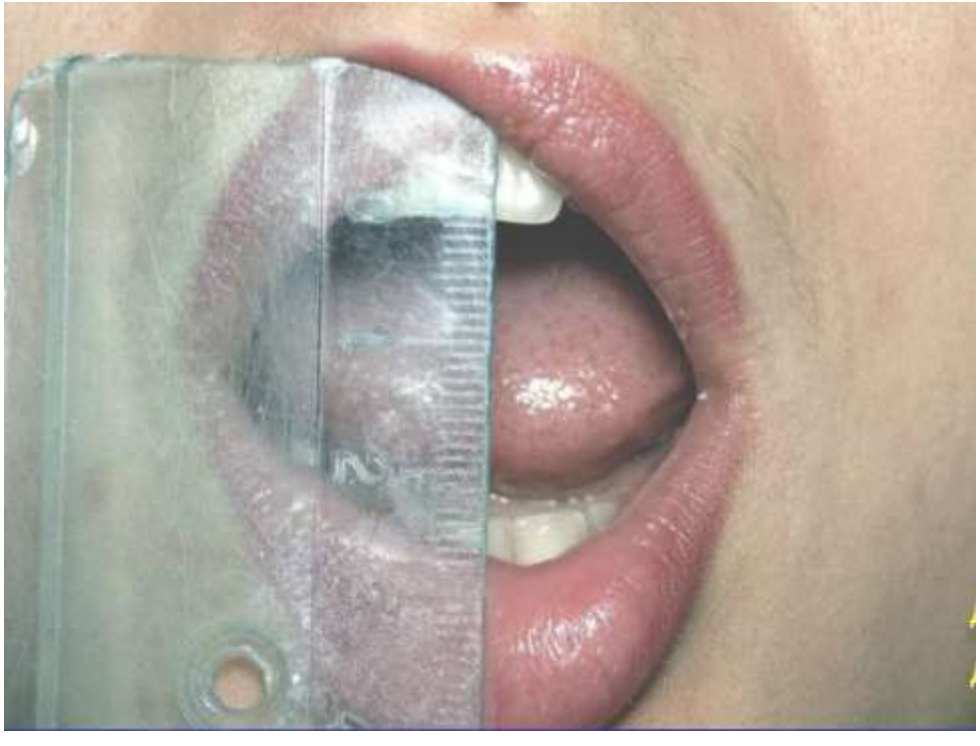
Myofasdal pain and dysfunction (MPD) is the most common cause of masticatory pain and limited function for which patients seek dental consultation and treatment. The source of the pain and dysfunction is muscular, with masticatory muscles developing tenderness and pain as a result of abnormal muscular function or hyperactivity. This abnormal muscular function is frequently but not always associated with daytime clenching or nocturnal bruxism. The cause of MPD is controversial, although it is generally considered to be multifactorial. One of the most commonly accepted causes of MPD is bruxism secondary to stress and anxiety, with occlusion being a modifying or aggravating factor. MPD may also occur secondary to internal joint problems, such as disk displacement disorders or degenerative joint disease (DJD).

Patients with MPD generally complain of diffuse, poorly localized, preauricular pain that may also involve other muscles of mastication, such as the temporalis and medial pterygoid muscles. In patients with nocturnal bruxism, the pain is frequently more severe in the morning. Patients generally describe decreased jaw opening with pain during functions such as chewing. Headaches, usually hitemporal in location, may also be associated with these symptoms. Because of the role of stress, the pain is often more severe during periods of tension and anxiety.

Examination of the patient reveals diffuse tenderness of the masticatory muscles. The TMJs are frequently not tender to palpation. In isolated MPD, joint noises are usually not present. However, as mentioned previously, MPD may be associated with a variety of other joint problems that may produce other TMJ signs and symptoms. The range of mandibular movement in MPD patients may be decreased and is associated with deviation of the mandible toward the affected side. The teeth frequently have wear facets. However, the absence of such facets does not eliminate bruxism as a cause of the problem.

Radiographs of the TMJs are usually normal. Some patients have evidence of degenerative changes, such as altered surface contours, erosion, or osteophytes. These changes, however, may be secondary to or unassociated with the MPD problem.

WIDTH AND TRAJECTORY OF MOUTH OPENING



PALPATION OF TMJ AND MUSCLES

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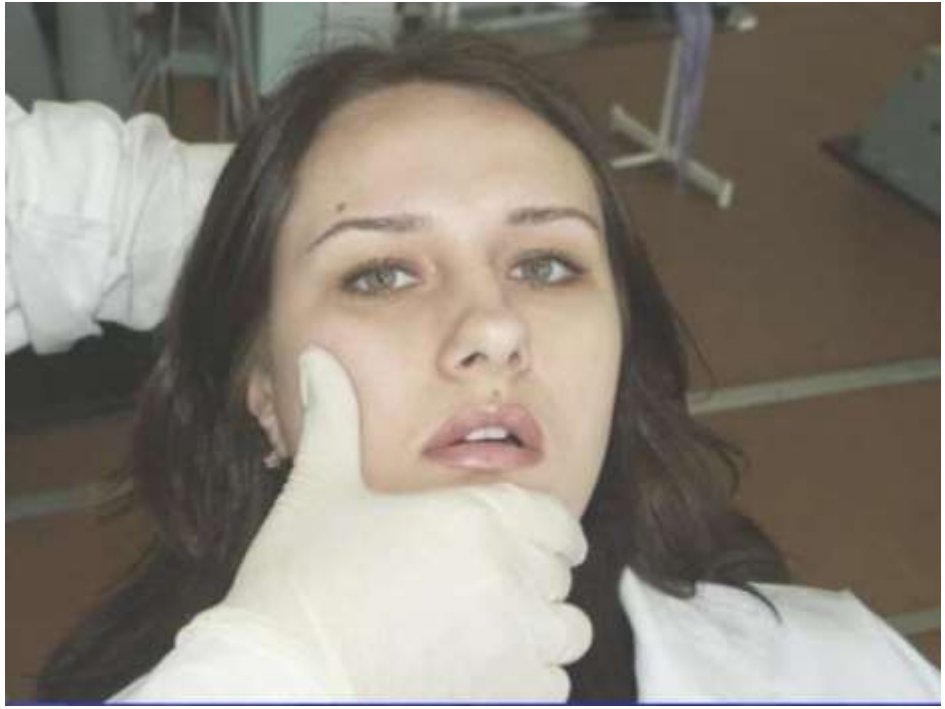
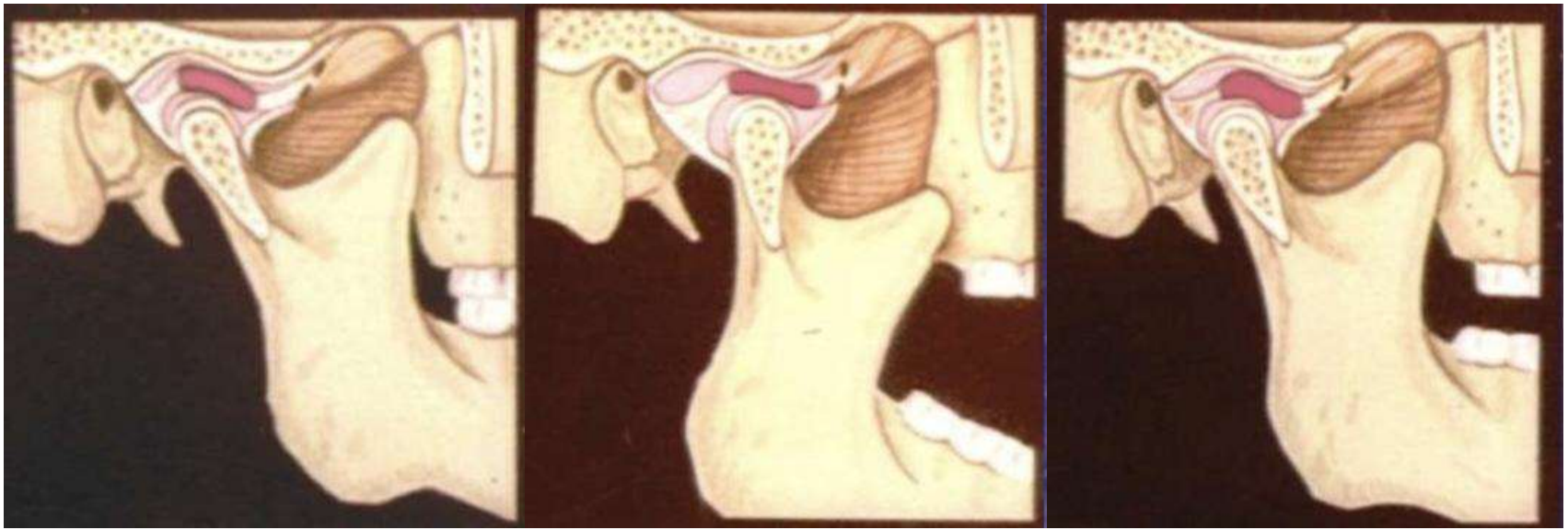


BITE AND OCCLUSION CONTACTS ASSESSMENT

ANALYSIS OF SYLLABIC SOUNDS



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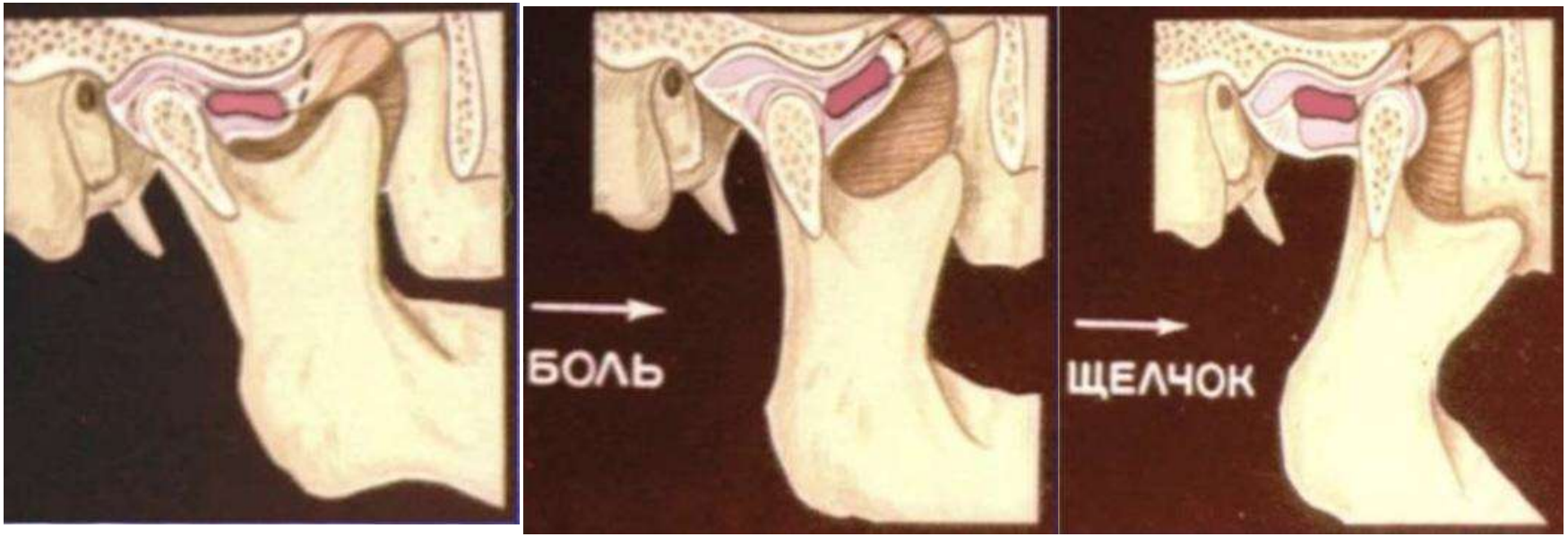

X-RAY METHODS

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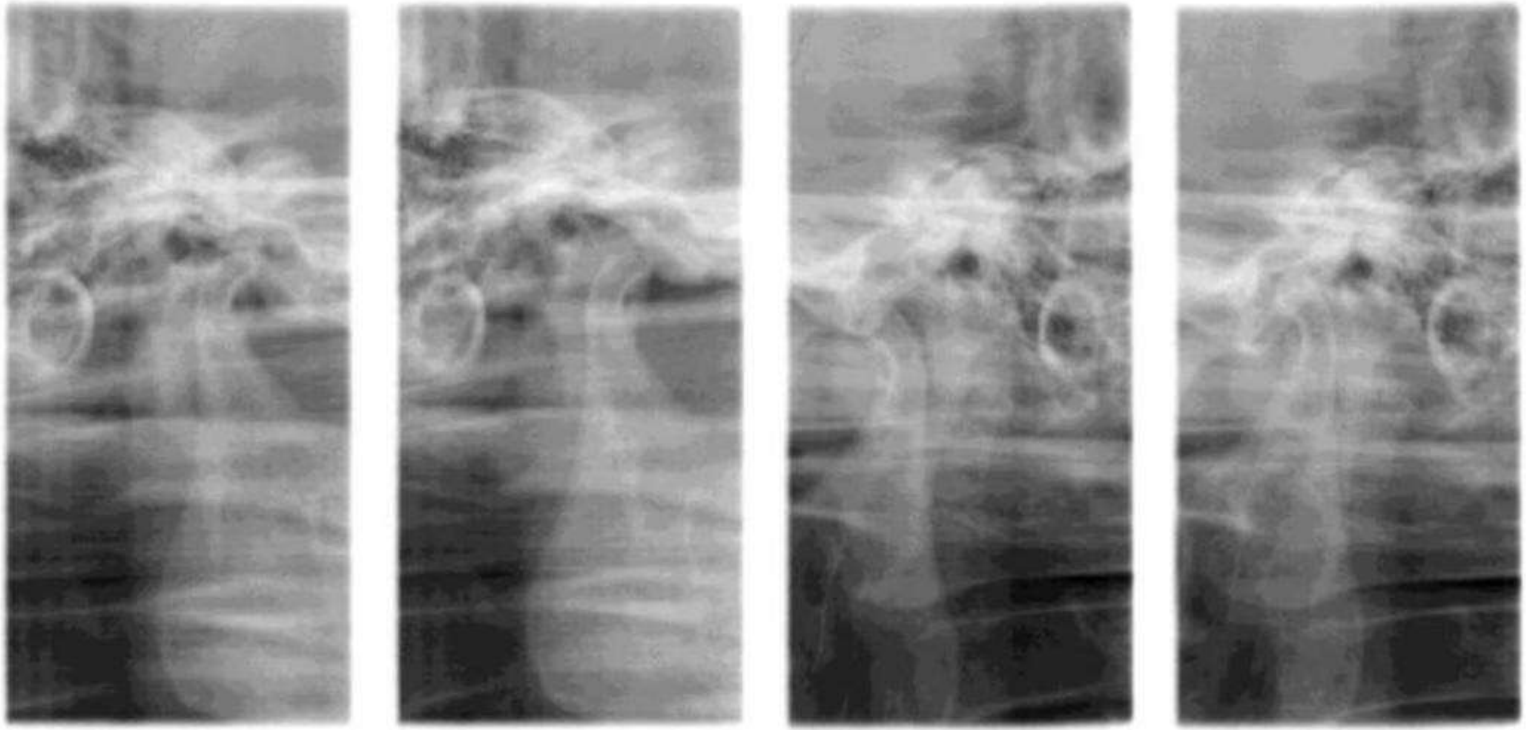
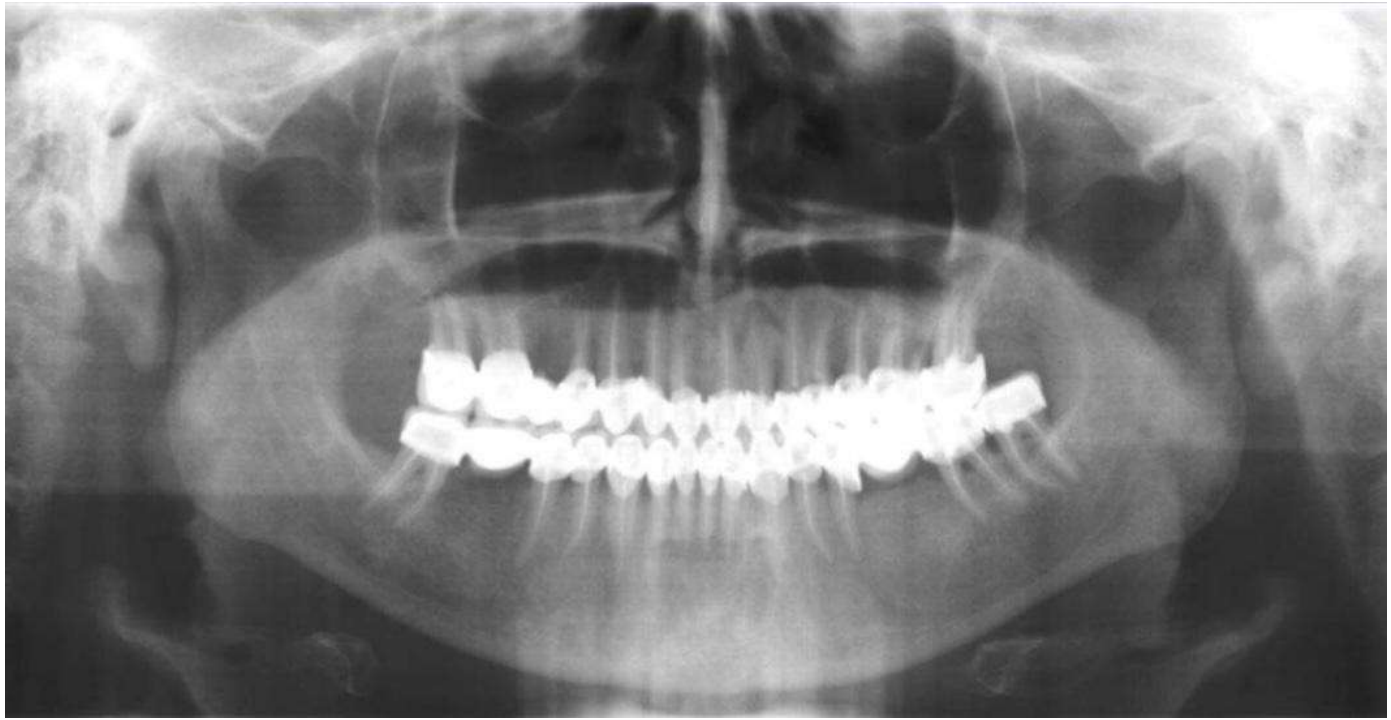


X-RAY METHODS

depth of cut 2 - 2.5 cm



MAGNETO-RESONANCE TOMOGRAPHY

-Allows you to assess the condition not only of the bone, but also of the soft tissue elements;

- in 3 planes;

- in dynamics;

- relative X-ray density

METHODS OF TREATMENT OF TMJ DYSFUNCTIONS

- Orthopedic
- Orthodontic
- Therapeutic
- Surgical
- Comprehensive

METHODS OF SURGICAL TREATMENT

1. The choice of the method of surgical treatment depends on the character of the pathological process in the TMJ, the degree of functional and structural disorders in bone and soft tissue elements of the joint.

2. During the surgical treatment of internal disorders of the joint associated with pathology of the articular disc, ligamentous-capsular apparatus preference should be given to minimally invasive endoscopic technologies comparable to open access methods.

3. Resection of the articular process due to various pathological conditions processes should be carried out simultaneously with arthroplasty auto or allografts, endoprosthesis based on three-dimensional reconstruction using laser stereolithography.

METHODS OF SURGICAL TREATMENT

4. Surgical treatment of TMJ ankylosis must be carried out early terms to ensure full-fledged psychosomatic development patient, prevention of secondary jaw and occlusal deformities

5. Endoprosthetics of the jaws should be carried out according to the relevant procedures, mainly for ankylosis. During joint endoprosthetics a complete endoprosthesis should be used, including the endoprosthesis articular fossa and half-joint endoprosthesis with the aim of its full-fledged functioning and exclusion of displacement of joint elements in the middle cranial fossa

6. Better results in the surgical treatment of TMJ diseases are achieved in a comprehensive approach and maxillofacial cooperation a surgeon with an orthopedic doctor, an orthodontist, a physiotherapist, a physical therapist and according to other symptoms - with other specialists.

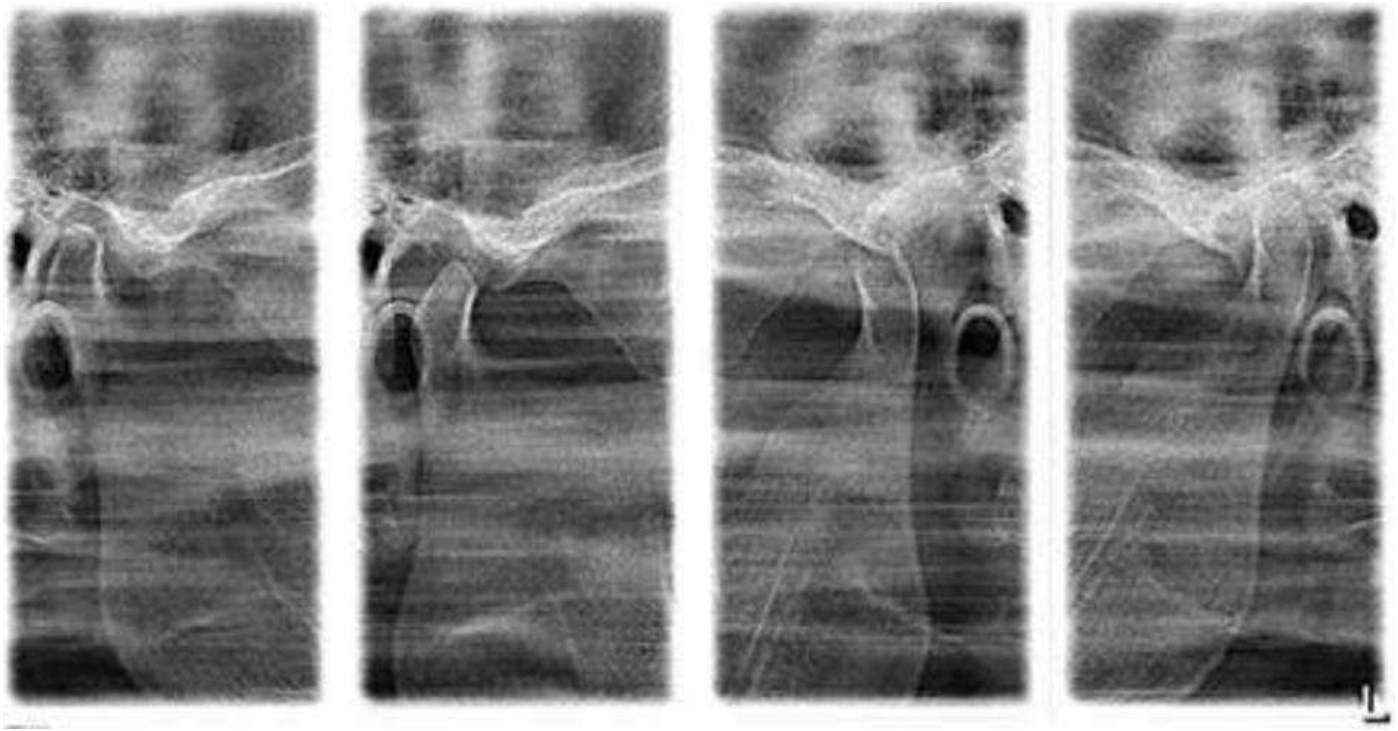
Problems, tasks and methods of surgical treatment of patients with TMJ diseases

Problems	Tasks	Ways of solving
1. Arthritis (synonyms: catarrhal, purulent, polyposis)	Elimination of the inflammatory process	• Drainage of a joint abscess. • Arthrocentesis or joint lavage. • Intra-articular injection of glucocorticoids according to the method of A.M. Sokolova • Intra-articular laser irradiation according to the method of N.G. Krotkih, Yu.I. Annikeeva • Endoscopic rehabilitation of the joint according to J.P. Mc Cain or M. Ohnishi
2. Absence or reduction products synovial liquid	Magnification quantity synovial liquids in joint cavity	• Restoration of the amount of synovial fluid
3. Displacement articular disc, that is not practiced	Repositioning articular disc	• Hydraulic pressing according to the method of K. Muracami • Endoscopic reposition and fixation of the joint disk according to J.P. Mc Cain or A. Holmlund • Open reposition and fixation of the articular disc according to F.T. Temerkhanov

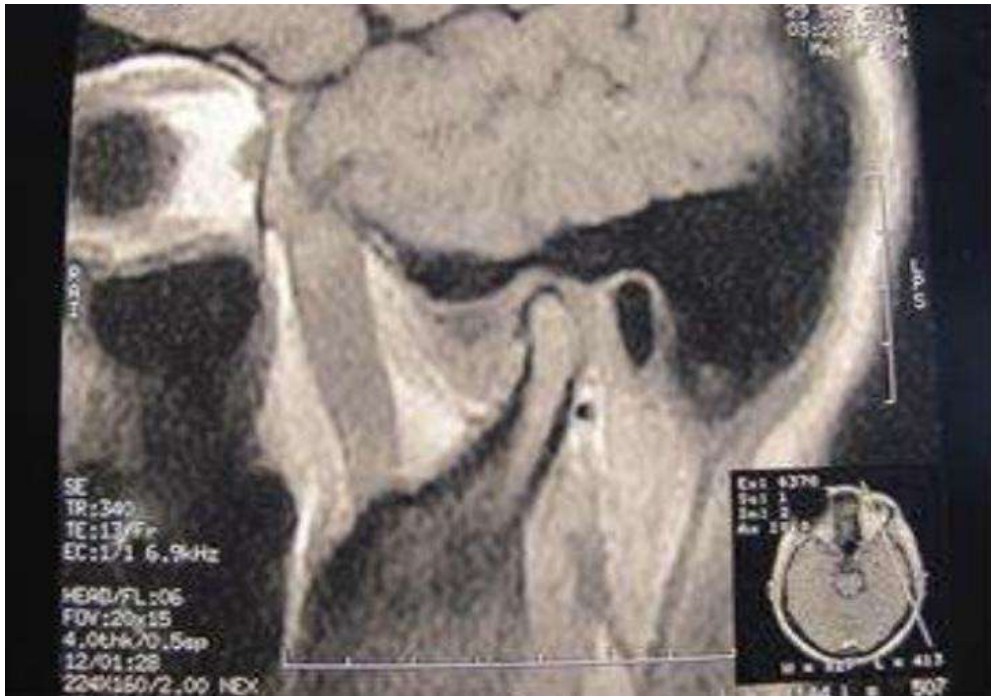
Problems, tasks and methods of surgical treatment of patients with TMJ diseases

4. Usual dislocation joint	Removal of the front articular dislocation heads	• Increase in the height of the articular tubercle by • A.E. Rauer, V.A. Sukacheva, • P.G. Sysolyatinym, A.A. Ilyina
5. Raised stretching necessarily capsular device	Strengthening of the capsular apparatus is mandatory	• Joint capsule plastic surgery according to T. Temerkhanova, P.G. Sysolyatin, A.A. Ilyina, W. Kaduk • Posterior intraarticular plastic surgery connections according to P.G. Sisolyatinym.
6. Deformation lower head jaws	Restoration of the head lower jaw	• Arthroscopic plastic surgery by J. H. Quinn, A.M. Nikandrova, ON. Plotnikova, A.A. Nikitina • Focal chondroplasty according to P.G. Sysolyatinym, A.A. Ilyina
7. Splicing lower head jaws with base skull (ankylosis)	Restoration of mobility lower jaw	• Endoprosthetics according to V.A. Semkin, I.N. Lyasheva • Allogeneic joint transplantation according to N.A. Plotnikova, A.A. Nikitina • Compression-distraction osteosynthesis according to M.G. Semenov, A.A. Safonova • TMJ restoration with use vascularized tissue grafts

Sonogram of TMJ



MRI of TMJ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