

DENTO-MAXILLARY RADIOLOGY AND IMAGING

Course 9

TMJ PATHOLOGY RADIOIMAGING DIAGNOSIS

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9.1. TMJ ANATOMY

Temporo-mandible joint is the most evoluated from the human body being also the most used one. Anatomically it is symmetrical, bicondylar meniscus diarthrod, which ensure the lowering, elevation, protrusion, retraction and rotation movements of the mandible.

It have a complex structure formed by:

- temporal bone glenoid cavity,
- mandible condyle,
- temporal bone eminence or tubercle, filogenesis human decisive element, which permit complete open of the mouth without secondary compression of delicate neck structure by the mandible angle through an anterior translation movement of condyles.

Meniscus or intraarticular disc interpose between skeletal joint components and separate the articular space in two independent articular compartments:

- a superior disco-temporal one, which anteriorly translate the disc and mandible condyle on the posterior face of the temporal tubercle and
- an inferior condylo-discal one, which rotate the mandible condyle head on the anterior disc surface.

9.2. TMJ PHYSIOLOGY

The joint is neuro - sensorial and vascular supply by an important capsulo - ligament complex which intermediate and make possible the mechanic active component dynamic - mastication muscles:

- masseters, temporals and medial pterygoid muscle elevate the mandible;
- inferior belly of lateral pterygoid and suprahyoid muscles lower the mandible;
- superior belly of lateral pterygoid muscles exert an anterior traction of

the intraarticular disc.

Lateral and medial pterygoid muscles bilateral contractions will realize mandible protrusion and lowering by mandible condyles and intraarticular disc translation.

Lateral and medial pterygoid muscles homolateral one side contractions will realize mandible laterality movement.

9.3. IMAGING DIAGNOSIS METHODS

ULTRASOUND

Superficial symmetric and bilateral topo – anatomic situation, offer a successful exploration tool for both articular compartments with suggestive, dynamics and in real time image acquisition using dedicated surface transducers of 7 – 10 MHz.

RADIOGRAPHY

In specific projections (Parma, Schüller) done in both “closed mouth” și “open mouth” positions made possible the identification and localization of miscellaneous regional morbid entities.

CT and MRI

Offer the imaging possibility investigation in all 3 spatial plans with ability in 3D images reconstruction.

Have specific diagnosis performing abilities:

- osteo - articular - CT - scan,
- disco - ligamentar and musculo - tendinos - MRI.

9.4. CONGENITAL AND DEVELOPEMENTAL DISORDERS

Mandible condyle aplasia associates miscellaneous malformation with asymmetry and dental eruption disorders.

Mandible condyle hypoplasia may be congenital or acquired (posttraumatic, post radiotherapy, post infectious). Usually associate facial asymmetry, dental eruption disorders and ankylosis.

Mandible condyle hyperplasia may be uni – or bilateral and determines secondary prognatism with occlusion disorders.

9.5. INTERNAL DERANGEMENTS

Are determined by abnormally movement of intraarticular disc:

- disc anterior movement to the mandible condyle may be associated by dynamic reduction with normal relocation during the mouth opening, being the mildest form of disease without disc morphologic changes.
- disc anterior movement without dynamic reduction and also disc posterior

movement are associated with disc: distortions, compressions and perforations.

9.6. ARTICULAR DISEASE

May be:

ARTHRITIS

- traumatic,
- infectious non - specific and specific (tuberculous, syphilitic, actinomycetes),
- rheumatoid,
- hyperuricemic.

ARTHROSIS

- degenerative.

ARTHRITIS

TRAUMATIC ARTHRITIS

Appear due to mechanical involvement of miscellaneous joint components, the worst being the secondary condylar head or glenoid cavity fracture usually associated with local suppuration and ankylosis.

RHEUMATOID ARTHRITIS

Are present in varying proportion in clinic manifested polyarthritis patients - radiographic detected by structural changes of condylar head with regional osteogenic productions.

HYPERURICEMIC ARTHRITIS

Affect in great proportion the gout patients being diagnosed by clinico - biological specific aspect without unusually radiographic images.

INFECTIOUS NON - SPECIFIC ARTHRITIS

Result from intraarticular extension of the neighboring infectious process or by hematogenous spreading of infectious disease (scarlet fever, typhoid fever, measles).

Have a noisy symptomatology with an initial mild radiographic aspect - minor joint space widening, followed in next evolutive stages by marginal osteolysis and bone remodeling.

INFECTIOUS SPECIFIC ARTHRITIS

SYPHILITIC ARTHRITIS

Appear in secondary and tertiary stages associated with mandible condyle atrophy or hypertrophy without secondary ankylosis.

TUBERCULOUS ARTHRITIS

Rarely, always secondary by invasion of neighboring regional involvement being associated by great destructive osteolysis with fibrosis and ankylosis.

ACTINOMYCETES ARTHRITIS

Appear by extension of the localizations to the neighboring soft tissues, always respecting the skeletal structures but in association with an accentuated secondary, periarticular fibrosis.

ARTHROSIS

Are degenerative disorders radiographic and imaging identified due to all joint components changes with:

- osteogenic productions,
- geode osteolysis,
- capsulo - discal and synovial fibrosis with secondary luxations and recurrent subluxations.

9.7. TEMPORO - MANDIBULAR TRAUMAS

As: contusions, sprains (anterior, posterior, and lateral) and articular wounds are identify by clinico-radiologic and imaging specific aspects, being often followed by complications: sepsis, fibrosis and secondary ankylosis.

9.8. TEMPORO - MANDIBULAR ANKYLOSIS

Most often represent the end stage of any incorrectly treated morbid entity (traumas, infections, arthrosis), also appearing as a result of a tumoral development: benign (osteoma, fibroma) or malignant (condro or fibrosarcoma, synovial sarcoma).

Diagnosis assessment by radioimaging identifying of specific lesional syndrome: traumatic, infectious, arthrosis, tumoral.