

The Temporomandibular Joint Examination

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Definition

The temporomandibular joint (TMJ) is the articulation of the mandibular condyle with the glenoid fossa of the temporal bone. Normal movement of the mandible depends on proper function of the TMJ. Externally, the preauricular area lies directly over the joint.

Technique

Begin by inspecting the preauricular area for swelling or erythema. Palpate directly over the joint while the patient opens and closes the mandible, and the extent of mandibular condylar movement can be assessed. Normally, condylar movement is easily felt. Have the patient close slowly, and you will feel the condyle move posteriorly against your finger. Tenderness elicited by this maneuver is invariably associated with articular inflammation. Palpate the superficial temporal artery for nodularity and tenderness.

Palpate the masticatory and cervical muscles and search for areas of tenderness or sustained contraction. Begin with the sternocleidomastoid, trapezius, and posterior cervical muscles. Palpate the masseter at its attachments to the zygomatic arch and angle of the mandible, the temporalis both in the temporal fossa and intraorally along the ascending ramus of the mandible, and the medial pterygoid bilaterally, placing one finger externally at the medial aspect of the angle of the mandible and the other finger orally in the lingual vestibule in the retromolar region. The lateral pterygoid is accessible to the examining finger intraorally posterior to the maxillary tuberosity. Areas of identified muscle spasm or tenderness can be injected with local anesthesia, 2% lidocaine or 0.5% bupivacaine without epinephrine, or can be sprayed with fluoromethane or ethyl chloride to determine if these areas are the cause of the patient's symptoms.

Examine the external auditory canal and tympanic membrane with the otoscope and do tuning fork tests to rule out ear pathology, particularly important in patients who complain of hearing changes in association with TMJ symptoms. An audiogram may be indicated if hearing loss is suspected.

The joint is auscultated during mandibular motion. The normal joint functions relatively quietly. Listen for crepitus or grinding and clicking or popping sounds.

The degree of mandibular opening is measured using the distance between the incisal edges of upper and lower anterior teeth. Opening of less than 35 mm is considered abnormal in an adult. There is no upper limit of normal, but few patients can exceed 60 mm comfortably. Observe the opening pattern for deviation. The mandible often deviates toward the affected side during opening because of muscle spasm or mechanical locking by a displaced meniscus.

Examine the hands for signs of systemic disease (e.g., Heberden's nodes of osteoarthritis, ulnar deviation of rheumatoid arthritis), which may also involve the TMJ. Laboratory tests (e.g., complete blood count, erythrocyte sedimentation rate, rheumatoid factor, antinuclear antibody, serum uric acid) are helpful when a systemic cause for TMJ disease is suspected.

Radiographs provide useful information about bony architecture of the joint and movement of the condyles during mandibular opening. Lateral transcranial films display the anteroposterior contour of the bony joint structures, whereas transpharyngeal or transorbital x-rays show mediolateral condylar anatomy. Tomograms or a computed tomographic scan determine the extent of a joint ankylosis or tumor. Arthrography or magnetic resonance imaging (MRI) is helpful in determining the position, movement, and integrity of the meniscus.

Basic Science

The temporomandibular articulation is unique in the body in that the two joints must always move simultaneously. Two distinct movements, rotation and translation, occur in the joint during mandibular opening and closing. The TMJ, therefore, is called a *ginglymoarthroidal joint*.

Mandibular opening is initiated by action of the suprahyoid muscles. Simple rotation of the mandibular condyle in the glenoid fossa accounts for the first 25 mm of interincisal opening. Further opening is due to a forward gliding or translation of the condyle along the posterior slope of the articular eminence. Forward motion of the condyle is guided by action of the lateral pterygoid muscle. Mandibular closure is due to action of the temporalis, masseter, and medial pterygoid muscles.

A fibrocartilaginous disk or meniscus, less than 1 mm thick, separates the condyle and glenoid fossa from direct contact and divides the joint space into superior and inferior compartments. The disk normally is attached to the condyle medially and laterally and moves with it.

Any condition (tumor, muscle spasm, fracture, ankylosis, displaced meniscus) that prevents the normal translation of one condyle will not prevent the contralateral condyle from sliding forward normally. The result is deviation of the chin toward the affected side. If translation of the condyles is prevented bilaterally, mandibular opening is restricted, usually to less than 25 mm.

Clinical Significance

Temporomandibular joint disorders are classified as extraarticular and intraarticular. Extraarticular disorders of the TMJ are more common than are intraarticular; in some patients, intra- and extraarticular involvement exists si-

multaneously. TMJ disorders are a common source of patient complaints to their physician.

Extraarticular disorders include myofascial pain–dysfunction syndrome (MPDS), temporal arteritis, and psychopathology. MPDS is a common affliction of the musculature surrounding the joint. It is seen most often in young adult females, but it may occur in any age group. MPDS is due to sustained contraction of the masticatory muscles (by clenching, bruxism, or jaw thrusting) in response to stress. Repetition of these parafunctional maneuvers establishes a self-perpetuating cycle of pain and muscle spasm, which often spreads beyond the muscles of mastication to involve other muscle groups (e.g., sternocleidomastoid, trapezius, or posterior cervical) in the head and neck region. The classic syndrome, which may be unilateral or bilateral, includes the complaint of pain in the TMJ area, tenderness and/or spasm of the masticatory muscles on the affected side(s), and limited mandibular opening with deviation. Except when MPDS is secondary to intraarticular disease, joint radiographs show normal bony architecture but limited or absent translatory condylar movement.

Patients with psychiatric disturbances may complain of TMJ pain or dysfunction. These complaints are out of proportion to physical findings. Symptoms are relieved following the institution of appropriate psychiatric care and psychotropic medications.

Intraarticular conditions of the TMJ include dislocation, arthritis, ankylosis, meniscus disorders, and tumors. Dislocation may occur as the result of yawning, prolonged opening of the jaw, trauma, a pernicious habit, or neuromuscular disorders. The condyle, during extreme mandibular opening, translates forward anterior to the articular eminence and, because of muscle spasm, becomes lodged in that position. The patient cannot voluntarily return the condyle to the glenoid fossa and achieve mandibular closure.

Any of the various arthritides (e.g., degenerative joint disease, rheumatoid, gouty, septic) may affect the TMJ alone

or in association with a generalized condition. Crepitus is often heard in the joint during mandibular motion. Associated MPDS is common. Generalized manifestations of the underlying disease are often found. As many as 5% of all patients with arthritis elsewhere develop TMJ involvement, which may be the initial presentation in some cases.

Ankylosis of the joint may be either fibrous or bony and due to infection, rheumatoid, or other collagen-vascular arthritis or trauma. Mandibular opening is generally limited to 15 mm or less. Differentiation between mandibular hypomobility secondary to coronoid process enlargement and ankylosis is made on radiographs.

Displacement or injury to the fibrocartilage disk within the joint presents as clicking or popping and deviation to the affected side during jaw opening or “locking” of the jaw in which the disk completely blocks condylar translation and limits mandibular opening to less than 25 mm. MPDS commonly accompanies this situation.

Tumors of the joint are uncommon. Enlargement of the condyle or coronoid process by hyperplasia, osteochondroma, osteoma, or sarcoma causes progressive facial asymmetry and change in dental occlusion. Pain and limitation of mandibular opening are frequent associated complaints.

References

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