Disorders of the temporomandibular joint

A great number of people (60–70%) have some problem with the temporomandibular joint (TMJ) but most are asymptomatic. About 25% of this group has symptoms that can be attributed to the TMJ.1,2 Of this group only 5% will get treatment and these patients are mostly women – they outnumber male patients by at least 4:1.3 Temporomandibular disorders occur at any age but most often in young adults.4,5

Pain the temporomandibular area is the most common complaint and is easily related to a lesion of the TMJ.6,7 However, the exact cause of TMJ problems is often difficult to determine because several disorders may be present at the same time and combined muscular and inert tissue disorders are not uncommon. As a consequence, it may be necessary to treat both joint and muscle. Conservative treatment is still the most effective management for more than 80% of patients.8

There are several major causes of TMJ problems:9

• A single major injury, even if it has been only a light blow to the mandible or extreme stretching of the TMJ, can permanently injure the joint and ligaments.10
• Repetitive microtraumas, such as clenching, grinding or atypical chewing for a prolonged period of time, may damage the joint and then lead to muscular problems.
• Monoarticular arthritis and inflammatory polyarthritis, such as rheumatoid arthritis, but seldom psoriatic arthritis, may affect the joint.11
• Abnormal biomechanical loading as a result of structural changes of the teeth may also be harmful. However, this should not be overestimated as a cause of TMJ problems.12

Disorders of the temporomandibular joint are summarized in Table 1.

Disorders of the inert structures

The most common disorders of the inert structures are internal derangement and arthritis. The former may be present in hypermobile joints or may affect a normal joint, so leading to hypomobility.

Internal derangement

Internal derangement is usually the result of lack of coordination between the meniscus and the condyle, in which the meniscus displaces anteriorly and the condyle posterosuperiorly. Acute or chronic repetitive injury may be the cause. Acute injury, such as whiplash, traumatic tooth extraction or intubation during anaesthesia, may displace the condyle posteriorly, so stretching the posterior attachments of the meniscus. Repetitive microtraumas occurring over a longer period, as a result of loss of posterior teeth or interference with the incisors, may provoke a posteriorly directed force on the jaw, which again displaces the mandibular head posteriorly.

Initially, this process is characterized by reciprocal clicking, later by temporary or continuous locking. Finally, osteoarthritis may result.

Each stage of internal derangement may give rise to painful chronic irritation of the synovium, with resulting arthritis.
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Table 1: Summary of disorders of the temporomandibular joint
Disorders of the temporomandibular joint

The other thumb, protected by a rubber pad, is placed on the molar teeth and the fingers pass round the mandibular body. Downward pressure is applied to the molar teeth, which distracts the joint surfaces, allowing repositioning of the meniscus on the condyle.

**Technique: distraction with anterior glide**

In the same position, the tip of the index finger of the manipulating hand is hooked around the mandibular angle. Downward pressure and anterior pull are applied. This restores the anterior translatory glide which has been lost because of capsular retraction or because of the anteriorly displaced meniscus.

**Technique: combined distraction, anterior glide and lateral stretch**

The mandible is additionally pulled to the side, towards the therapist, thus realigning the fibres in all three planes of space.

**Technique: lateral glide without distraction**

The position and fixation of the patient is the same as for previous techniques. The hand grasps the mandible around the angle and pulls it towards the therapist, restoring lateral joint movement.

**Home exercise programme**

The patient is shown how to perform self-mobilizing techniques on opening, on forward movement and on lateral excursions of the mandible.

The muscles of mastication should be gently stretched to their full length. Coordination can be increased by practising hinge-type movement of the jaw and then making specific lateral movements without protrusion. Jaw movements must be limited to the click-free range and chewing on the side that provokes any noise must be avoided.

If significant painful clicking is associated with a possible meniscus displacement, a repositioning occlusal splint can be useful. It is used only if a small change in the position of the mandible stops the click on opening and closing of the mouth. It should initially be worn 24 hours a day for 8–10 weeks, except while eating. Once the clinical symptoms have diminished, use of the appliance is progressively decreased, although a part-time repositioning appliance is needed.

**Fixed dislocation of the meniscus**

Progression of the disorder may finally lead, via momentary self-reducing dislocations, to a permanent luxation of the meniscus. From time to time the joint becomes suddenly locked, with the meniscus lodged anterior to the condyle.

With a dislocated meniscus, clinical examination shows a reduced range of opening of the mouth. Because of loss of anterior translatory glide, only rotation is possible. In such a condition the patient can always open the mouth by at least 1 cm but often not any wider. Full closure remains possible and is painless. The chin deviates to the ipsilateral side and deviation to the contralateral side is painful.
The Temporomandibular Joint

 Treatment

Manipulative reduction

Manipulative treatment aims to restore the normal relationship between the meniscus and the joint surfaces.

Technique (Fig. 2)

The patient lies on a high couch. The manipulator stands at the patient’s opposite side and puts one thumb, protected by a thick pad, on the molar teeth of the affected side. The other hand is put around the patient’s head and holds it steady. Caudal pressure is now applied to the molar teeth and swift translatory movements of the patient’s mandible are performed, three or four times. During the manoeuvre, the reduction click is felt.16

Manipulative reduction usually succeeds in one session.

Problems arising because of hypermobility

Hypermobile joints may also give rise to reciprocal clicking, subluxations and dislocations because of excessive translatory glide. On clinical examination, excessive movements are found together with clicking. Treatment consists mainly of stabilizing the joint and avoiding excessive anterior translatory gliding of the condyle by controlling the rotation in the joint. To do this, the patient is instructed to put and to keep the distal third of the tongue flat against the palate during opening, which limits opening to rotation movement only and reduces the tendency to anterior sliding. This method of opening should also be performed when chewing and protects the joint from further wear and tear.

Arthrosis

Arthrosis of the TMJ may be the final stage of internal derangement or is sometimes due to bruxism or missing molar teeth. In primary osteoarthrosis, no apparent cause is present.17

The outcome of progressive change in internal derangement is shortening and fibrosis of the meniscus-condyle attachments, and occasionally perforation or total rupture of the meniscus. Paradoxically if the latter occurs, there is only a small limitation or even complete freedom of movement, so that subjectively the patient feels better although radiography clearly shows the degenerative changes. The click changes to a more grinding noise.

Patients with arthrosis are usually over 40 years of age and it remains unilateral.18 Usually, it does not give rise to significant inflammation or swelling, or to severe pain or limitation of movement. Only when the capsule is inflamed does it cause pain, in which case it is often present in any part of the range of movement. Crepitus is frequently found; limitation of opening of the mouth and of contralateral deviation of the chin may be present. On opening, the chin deviates to the affected side. Palpation of the back of the condyle is usually tender. Pain and stiffness increase during the day.

A radiograph shows flattening of the anterior slope of the condyle and the posterior slope of the articular tubercle, with loss of joint space and formation of osteophytes.

The complaints usually diminish progressively over 2–3 years with little painless residual disability. However, about one in five patients still has pain after 2 years.19 Ankylosis is uncommon.

Technique: deep friction (Fig. 3)

For friction the patient lies on a couch, painful side up. The therapist sits behind the patient and places the index of the ipsilateral hand, reinforced by the middle finger, in front of the joint line. This is easily palpable, just cranial to the mandibular head, on opening and closing the mouth. The other hand stabilizes the head on the skull. The index finger is now pulled backwards while pressure is applied. Friction is given for about 20 minutes, three times a week.

Technique: intra-articular injection (Fig. 4)16

The patient lies with the affected side up. The posterior aspect of the mandibular condyle is palpated, anterior to the tragus and below the zygomatic bone. The space to be injected lies...
Disorders of the temporomandibular joint

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Luxation of the condyle

In luxation, both condyle and meniscus lie in front of the articular tubercle (Fig. 5). It is usually bilateral and is encountered most frequently in hypermobile joints. The onset is often a result of yawning or excessive laughing with the mouth wide open. The patient is suddenly unable to close the mouth. If closing is tried passively, there is an elastic recoil. Sometimes the dislocation is temporary and can be reduced by the patient. In other cases, manual reduction is needed.

Treatment

Treatment is by manipulative reduction.

**Technique: manipulative reduction** (Fig. 6)
The patient sits in a chair. The manipulator stands at the front, puts both thumbs on the molar teeth and grasps the mandible with the fingers. Caudal pressure is now applied with the thumbs and simultaneously the chin is pulled in the cranial direction so as to close the mouth."
**Synovial disorders**

Arthritis of the TMJ is clinically characterized by pain on movement, crepitus and tenderness over the joint. Sometimes progressive limitation of opening of the mouth follows but the joint is only exceptionally ankylosed.

**Monoarticular steroid-sensitive arthritis**

For no apparent reason, a patient may develop progressive pain in one of the TMJs without other joints being affected.

Opening the mouth becomes progressively painful and limited and may lead to inability to take solid food. On mouth opening the chin deviates towards the affected side but at rest in the closed position it deviates towards the other side. The disorder may persist for months. Because the lateral pterygoid muscle is attached to the anterior part of the joint capsule, in a severe case resisted opening of the mouth may also be painful.

Pain and stiffness are worse in the morning and improve after movement. Technical investigations for inflammatory disorders, such as radiography and laboratory tests, are negative.

**Treatment**

An intra-articular injection with steroid is usually effective and may be repeated after 1 week (see above).

**Inflammatory polyartritic diseases**

Juvenile rheumatoid arthritis, ankylosing spondylitis and rheumatoid arthritis sometimes involve the TMJs. They affect the synovium and may subsequently lead to destruction of bone. The clinical findings are the same as for monoarticular steroid-sensitive arthritis. The fact that other joints are affected, together with radiographic findings and laboratory tests positive for rheumatological disorders, reveal the exact nature of the condition.

Psoriatic arthritis, gout and lupus erythematosus are very rare and seldom give rise to bone destruction. There is no separate treatment for the TMJ; the joint is included in measures against the underlying disorder.

**Infections**

Infections of the TMJ are rare and are usually the result of an adjacent infection of the external auditory canal, the parotid gland or the middle ear. Inflammation may sometimes occur in viral diseases such as infectious mononucleosis, measles and mumps. Gonococcal infection has been reported.

The patient may be severely ill and complains of temporomandibular pain and limitation of mouth opening, with deviation towards the ipsilateral side. Bacterial infection of the TMJ requires hospitalization and, after culture of aspirated pus, is treated by antibiotics.

**Sympathetic arthritis**

An abscess in the neighbourhood of a TMJ may provoke a ‘sympathetic’ arthritis. Causes are peritonsillar abscess, pericoronitis of a partially erupted wisdom tooth or molar extraction. There is progressively increasing difficulty in opening the mouth, usually starting, if the cause is dental, 1–2 days after an intervention. Pain is found on all movements, and the bone at the base of the tooth is tender on palpation.

Spontaneous cure is usual in 2–3 weeks after molar extraction. If active treatment is necessary, it should be directed to the underlying disorder and not to the arthritis as such.

**Arthritis due to loss of molar teeth**

Patients lacking all molar teeth (unilaterally or bilaterally) sometimes develop unilateral arthritis which may occur at either side in relation to the missing molar teeth. Molar teeth normally have a distance-maintaining effect in apposition between the mandible and maxilla. Should this be lost, excessive upward pressure by the mandibular condyle on the temporal fossa occurs, which may lead to arthritis. This can also occur as a result of treating patients, who have missing molars, by cervical traction.

Patients complain of a continuous deep burning pain in the temporomandibular area, not necessarily influenced by eating. On examination pain is found at the extreme of all movements and slight limitation of opening may be present.

Treatment consists of dental correction of the distance between mandible and maxilla. When cervical traction has to be given, a splint of sufficient thickness to divert the strain to the posterior part of the mandible should be used (Cyriax: his p. 199).

**Muscular disorders**

Muscular disorders are usually the consequence of bruxism or clenching, which is commonly an unconscious way of coping with the stress of daily life and is seen more often in patients who are more subject to anxiety and depression than are members of the average population.

In addition to muscular pain, tooth wear, alveolar tenderness, mobility of the anterior teeth, pain and morning jaw stiffness are usually found.

The pain is elicited on maximum resisted isometric contraction.

**Myalgia**

Myalgia is described as a dull aching pain felt continuously in the area of the masticatory muscles and it may affect any of these. Cold weather may precipitate the symptom which, although present at all times, is usually worse at the end of the day, sometimes also disturbing the patient’s sleep. Resisted closing of the mouth is painful, as is maximum active opening,
which stretches the muscles. The muscles are usually very tender, and firm palpable bands within them are often present. The differential diagnosis includes temporal arteritis, which can also lead to myalgic pain. Redness and swelling over the artery are characteristic of arteritis.

**Treatment**

Primary therapy is a full-arch occlusal stabilization appliance. This involves the construction of a flat occlusal surface that is adjusted to have multiple tooth contact in a habitual comfortable jaw closure position. Initially it is worn continuously, except on eating, for 6–8 weeks and is adjusted several times to establish a comfortable jaw position. As the symptoms decrease, the amount of daytime wear of the appliance is progressively reduced.

In musculoskeletal pain from bruxism or tooth clenching the patient must break the habit. Advice is given to reduce all physical and mentally stressful activities during treatment. Muscle relaxants or anti-anxiety drugs can be useful. Hard or chewy foods are avoided. Application of moist heat to the temporal and masseter muscles for 20 minutes, three or more times a day, can be helpful.

**Muscular trismus**

Pathological muscular stimulation or inhibition may limit the opening of the mouth but only very rarely affect closing. Limitation is often the result of attempting to avoid pain. Trismus can be the outcome of a chronic pain problem or of a recent local event (injury or surgery).

When movement is attempted, there is often tremor of the jaw and incoordination. Treatment consists of solving the underlying problem.

Hysterical trismus is characterized by a total loss of ability to open the mouth. A vague pain, which extends over the whole of the head and face, is usually described. Very often these patients also hold the neck extremely still. Because it is very difficult to examine the TMJ in an unwilling patient, it is better to proceed with caution: multiple positive findings and inconsistencies should warn the examiner of a severe disorder or hysteria.

**Warning**

When trismus is present, tetanus should not be forgotten. Painless stiffness coming on abruptly at the TMJ, and causing complete inability to open the mouth, may be an early sign of the condition. In this event, both joints are usually affected.

**Abscess in the pterygoid muscle**

An anaesthetic injection for dental work may be followed some days later by an abscess. The cheek begins to hurt and feels stiff. The patient complains of problems on opening the mouth and has pain on chewing.

Clinical examination reveals a loss of range of mouth opening, together with pain on clenching. Resisted deviation towards the painless side also hurts.

Signs of infection including pyrexia should be sought. Treatment is with antibiotics and drainage.

**References**

