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Tutorial

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Temporomandibular Joint Disorders - An Overview

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Disorders of the temporomandibular joint may be extrinsic (muscular), intrinsic (dysfunctional), or a combination of both. An accurate differential diagnosis based on correlation of the clinical and radiographic findings is essential. A multi-disciplinary approach is necessary if thorough and proper treatment is to be rendered. Unfortunately many patients with these disorders do not know where to seek treatment, and as a result go untreated. Orofacial myologists by their very definition should be cognizant of temporomandibular joint problems, in order that the appropriate referral be made.

Anatomy

The temporomandibular joint is a diarthrodial joint formed by the temporal bone and the mandibular condyle. The temporomandibular joint is the only true joint of the skull with the exception of the auditory ossicles. The condylar process is covered by dense avascular fibrous tissue and articulates with the glenoid fossa and articular eminence of the temporal bone.

Between the condyle and the glenoid fossa is a dense fibrous tissue, the meniscus, which divides the joint space into an upper and lower compartment. Anteriorly the meniscus is attached to the capsule and ends posteriorly in the thick retrodiscal pad. This retrodiscal pad is composed of three strata: the superior (elastin), the middle (connective tissue), and the inferior (collagen), and is often termed the bilaminar zone.

Surrounding the entire articulation is the joint capsule which is composed of collagen. This capsule extends from the tympanic plate posteriorly to the neck of the condyle inferiorly. The anterior portion of the meniscus and the capsule are fused. This permits attachment of the external pterygoid muscle. There is no capsule on the medial or lateral one-half of the anterior aspect of the temporomandibular joint, and this is often referred to as the "Achilles heel" of the TMJ.

Associated with the temporomandibular joint are three ligaments. The temporomandibular ligament strengthens the lateral surface of the capsule and is directly involved in the movement of the temporomandibular joint. The other two ligaments, the stylomandibular and sphenomandibular, are accessory in nature and only function to limit maximum opening and protrusion.

The blood supply to the joint is provided by the branches of the internal maxillary artery, while the nerve supply is from branches of the auriculotemporal nerve.

Movement of the temporomandibular joint is governed by the muscles of mastication, with the external pterygoid muscle having the most direct influence on the intrinsic structures of the joint. All these muscles combine to allow the mandible to perform opening, closing, protrusive and retrusive movements. Within the temporomandibular joint itself gliding motion occurs in the upper compartment, and hinge motion in the lower compartment.

Classification of Temporomandibular Joint Disorders

I. Extrinsic (Extracapsular)

The primary extrinsic disorder of the temporomandibular joint is the Myofascial Pain Dysfunction Syndrome (M.P.D.) The M.P.D. patient is typically female in 80 to 90% of the cases and in the 25 to 40 year age range.

The patient usually presents with a dull unilateral pain which is relatively constant and associated with headaches. The pain is diffuse and may radiate from its point of origination to any portion of the face and neck. The patients report that the pain is relatively constant, however it is frequently worse on rising in the morning. Muscle tenderness is common, and palpation of the masticatory muscles elicits a severe lancinating pain.

There have been many theories proposed to explain the etiology of the Myofascial Pain Dysfunction Syndrome. Among them are the mechanical displacement, neuromuscular, muscular, and psychophysiologic theories. The psychophysiologic theory according to Laskin, states that there is a musculoskeletal disorder of the masticatory system arising from a

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lack of functional harmony of the joints associated with the musculature. Whether the etiology is a result of tension or dental irritation, muscular fatique results. This produces a myospasm which in turn produces muscular over-extension and over-contraction resulting in the Myofascial Pain Dysfunction Syndrome. Although the disturbance is one of function rather than structure, the chronicity of the problem will eventually lead to dysfunctional problems such as osteoarthritis, and subluxation or dislocation of the meniscus.

Treatment therapies are many and vary with the clinician. The key to successful treatment is an accurate diagnosis resulting from thorough evaluation of both clinical and radiographic data. After the diagnosis of M.P.D. is made, treatment may consist of occlusal adjustment, physiotherapy including heat, ultrasound or cold applications. Myotherapy consisting of retrusion reflex relaxation exercises, or external pterygoid muscle strengthening exercises may be used. If anxiety and tension are considered to be a major component of the problem, biofeedback and psychotherapy are utilized. Drug therapy such as Valium[R] for sedation and muscle relaxation in addition to analgesic medications, preferably aspirin, are often used as adjuncts to specific therapies.

Patients who have associated oral habits such as clenching and bruxism have biteplates, nightguards, or other types of splints constructed which will eliminate interferring occlusal contacts and thereby disengage the triggering mechanism which produces this severe myospasm.

The precise etiology of Myofascial Pain Dysfunction Syndrome remains obscure, however a thorough evaluation of clinical data followed by an orderly treatment approach with conservative therapies will hopefully provide patients with the initial treatment needed in order to correct their disorder.

II. Intrinsic (Intracapsular)

A. Degenerative Arthritis (Osteoarthritis)

Degenerative joint disease can occur in young as well as older people. Degenerative changes occur when the joint's functional capacity is exceeded by excessive occlusal forces, such as bruxism, or when the structural capability of the joint itself does not tolerate normal occlusal forces. As a result of this overload, clicking may occur secondary to meniscal subluxation. This dysfunction may progress to spasm of the masticatory muscles with stiffness and locking of the jaw. The osteoarthritis is usually unilateral although it may be bilateral in long standing cases.

Women are affected more often than men, and it usually occurs in the third or fourth decade. The pain is well localized over the head of the condyle, and radiates to the external auditory meatus. Crepitation and incoordinate jaw movements are often seen, particularly with wide opening, and become progressively worse during the day.

The destructive process is a primary disease of articular cartilage which progresses to the subcondylar bone, articular cartilage, and joint capsule. The histopathological process consists of several stages: fibrillation (loss of collagen), perforation, subarticular collapse, erosion, and finally repair.

Radiographically one sees a narrow joint space, bony scleroses, peripheral osteophytes (lipping), and flattening of the articular eminence. Laboratory values are unchanged which is not the case in rheumatoid arthritis.

Ten to fifteen percent of the cases require surgical correction. The procedure used is an arthroplasty (shaving of the condylar head) with or without menisectomy (removal of the meniscus). If a menisectomy is performed, then an implant must be inserted. The implant material may consist of a dermal graft, silastic, or a proplast teflon implant.

B. Rheumatoid Arthritis

Rheumatoid arthritis unlike osteoarthritis is a systemic disease which is inflammatory in nature. The manifestations of this disease are a result of this systemic infection which produces an inflammatory response within the joint. The second phase is an autoimmune reaction to the antigen produced by the initial inflammatory stage.

Initially there is a prodromal illness with fatique, fever, weight loss and stiffness in the joints. Later a polyarthritis, subcutaneous nodules, and vascullar lesions result. Unlike osteoarthritis, where articular cartilage is affected, it is the synovial membrane in the rheumatoid joint that becomes involved.

Fifty percent of the patients with rheumatoid arthritis have temporomandibular joint involvement. The patients usually present with deep, dull pain in the preauricular area, and crepitus as the predominant clinical finding. Progressive cases lead to retrusive profiles and an anterior open bite. Radiographically there is a loss of joint space and a sharp pointed condyle which appears cloudy.

Treatment for rheumatoid arthritis of the temporomandibular joint may be nonsurgical or surgical. Nonsurgical treatment consists of injection of steroidal anti-inflammatory drugs such as Solu-Cortef or Prednisone. Surgical treatment is indicated in those patients with persistent pain who demonstrate radiographic changes. The surgical procedure is similar to that used in patients with osteoarthritis, however in extensive cases, reconstruction with a Proplast metal condyle or surgical repositioning of the jaws may be indicated.

Summary

Temporomandibular joint disorders can be a complex and difficult problem. There are many etiologies which may include infection, trauma and congenital abnormalities. However, we can classify these disorders into two basic groups: Extrinsic (extracapsular), and intrinsic (intracapsular). Patients therefore may present with a functional disorder, Myofascial Pain Dysfunction Syndrome, or a structural disorder, such as Degenerative Osteoarthritis, or a combination of both. It is of paramount importance that the clinician determine the patient's primary etiology in order that a proper differential diagnosis and orderly treatment plan can be developed. This requires that a multidisciplinary team approach be used. The team may include a wide

variety of professionals such as a neurologist, otolaryngologist, oral surgeon, orthodontist, general dentist, psychologist and others. An overview of temporomandibular joint disorders has been presented in order to provide the Orofacial Myologist with the necessary information to make a rational and proper referral.

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