

Internal Derangement of the Temporomandibular Joint

New Perspectives on an Old Problem



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KEYWORDS

- Temporomandibular joint • Internal derangement • Classification system • Cause • Synovitis
- Osteoarthritis • Arthroscopy

KEY POINTS

- Internal derangement of the temporomandibular joint is not a disease, but a nonspecific sign of tissue failure leading to biomechanical dysfunction of the joint.
- Establishing the cause of the internal derangement is essential, because successful management must be based on the underlying cause of the pathologic process.
- Major categories of disease that cause temporomandibular joint internal derangement include inflammatory/degenerative arthropathy caused by joint overload, systemic arthropathy making the joint susceptible to tissue failure, atypical localized arthropathy (disorder localized to 1 temporomandibular joint), and false arthropathy (signs and symptoms that simulate internal derangement but are caused by extra-articular disorders).
- Minimally invasive operative arthroscopy is indicated when signs and symptoms persist, and often provides essential information on the cause of disease.
- Arthroscopic temporomandibular joint surgery permits biopsy of intra-articular disorders and is successful in reducing pain, increasing range of motion, and improving mandibular function, particularly in patients with inflammatory/degenerative arthropathies.

INTRODUCTION

Internal derangement of a synovial joint is not a disease. The biomechanical joint dysfunction that is associated with internal derangement represents a failure of the intra-articular tissues caused by the loss of the structure and function. Identifying the cause of the breakdown of the tissues within a synovial joint that leads to internal derangement is an important component of successful treatment. Clinicians must ask what disease process is causing the tissue breakdown. Is

there a history of acute or chronic trauma to the joint? Is there a systemic disorder that is contributing to the breakdown of connective tissues? Is there an infection or a tumor present that is causing the nonspecific symptoms of internal derangement? A clear understanding of this concept by clinicians is essential and has significant implications on patient management and the outcome of therapy.

On review of the literature on temporomandibular joint disorders over the past 35 years, the problem of internal derangement of the temporomandibular

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joint is often the central focus of the diagnosis and management of patients with orofacial pain caused by temporomandibular disorders (TMDs). Clear guidelines for diagnosis and management of internal derangement of the temporomandibular joint are often elusive, although there has been much excellent research on the validation of classification systems, such as the Research Diagnostic Criteria for TMDs¹ (more recently updated to the Diagnostic Criteria [DC] for TMDs)^{2,3} and the Wilkes Staging System⁴ for temporomandibular joint disorders. For any given diagnosis, there are multiple management options that have been recommended, including no treatment, nonsurgical therapies, minimally invasive surgical procedures (arthrocentesis, arthroscopy), arthroplasty (repair of intra-articular tissues), discectomy, and total joint replacement. The main focus of this article the concept of internal derangement and temporomandibular joint disorders from a new perspective, based on clinical research, basic science research on synovial joint pathophysiology, and the principles of diagnosis and management from the perspective of the specialties of rheumatology and orthopaedics. This information ultimately leads to new concepts in the classification of internal derangement based on cause and pathophysiology, and leads to new perspectives on the management and treatment of internal derangement of the temporomandibular joint.

CURRENT CLASSIFICATION SYSTEMS FOR TEMPOROMANDIBULAR JOINT DISORDERS

The Research Diagnostic Criteria (RDC) for TMDs,¹ published in 1992, was an excellent first step in helping to standardize diagnostic categories of TMDs. The RDC have undergone extensive testing and much research has led toward validating this classification system for TMDs to enable clinical

research investigators to use the same system. This progress has improved the overall ability to develop further insights into epidemiology, diagnostic categories, causes, and ultimately treatment/management of these disorders. The original investigators recognized that many of these patients had high levels of psychosocial stress along with the physical aspects of their disease, and so this diagnostic system included AXIS I, a classification system of the physical categories of TMDs, and AXIS II, a classification system of the psychosocial behavioral aspects of patients who develop these disorders. Following years of research involving validity testing of the RDC, more recently it became apparent that updates were necessary in this system to include a larger variety of disorders of the temporomandibular joint and surrounding structures. Thus recent changes in this classification system have been made, ultimately combining the RDC (recently changed to DC for TMD) with the American Association of Orofacial Pain (AAOP) Taxonomic Classification, which encompasses a larger and more accurate description of the variety of diseases affecting the temporomandibular joint and surrounding structures.³ Although it is beyond the scope of this article to review the details of the most current DC/TMD and AAOP taxonomic classification systems (Fig. 1), many of the classification categories describe nonspecific signs and symptoms, and not a disease process.

The Wilkes Staging System⁴ for internal derangement is frequently used by oral and maxillofacial surgeons and helps to provide a guide for treatment based on the severity of the damage to the joint. This system includes 5 stages with stage I being a painless disc displacement with reduction and stage V being an advanced disc displacement with severe degenerative changes, adhesions, subchondral bone changes, and disc perforation (Box 1). Because the main focus of the Wilkes

AAOP Taxonomic Classification for TMDs

1. Joint Pain
 - A. Arthralgia
 - B. Arthritis
2. Joint Disorders
 - A. **DISC DISORDERS**
 - B. Hypomobility disorders other than disc disorders
 - C. Hypermobility disorders
3. Joint Disease
 - A. Degenerative joint disease
 - B. Systemic arthritides
 - C. Condylsis/Idiopathic condylar resorption
 - D. Osteochondritis dissecans
 - E. Osteonecrosis
 - F. Neoplasm
 - G. Synovial chondromatosis
3. Fractures
4. Congenital/developmental disorders

DC/TMD

Axis I PHYSICAL DIAGNOSIS

TEMPOROMANDIBULAR JOINT DISORDERS DISC DISORDERS

1. Disc displacement with reduction
2. Disc displacement with reduction & intermittent locking
3. Disc displacement without reduction & limited opening
4. Disc displacement without reduction without limited opening

Axis II PSYCHOSOCIAL STATUS

Fig. 1. AAOP taxonomic classification and DC for TMDs.

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