

# Combined or Staged Temporomandibular Joint and Orthognathic Surgery for Patients with Internal Derangement and Dentofacial Deformities

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## KEYWORDS

- TMJ • Internal derangement • Dentofacial deformity • Orthognathic surgery
- Temporomandibular disorder

## KEY POINTS

- Thorough clinical and radiographic examinations are important to diagnose both the stage of the internal derangement and the dentofacial deformity accurately. It is important to differentiate myofascial pain and dysfunction from intra-articular joint problems.
- Depending on the stage of internal derangement, it can be managed symptomatically with nonsurgical treatment, staged separately with operative management, or treated at the same time as the orthognathic surgery.
- Generally, patients with early and intermediate stages of internal derangement can be managed nonoperatively before orthognathic surgery to reduce pain and increase range of motion and allow orthodontic treatment to proceed. Most of these patients experience an improvement in their TMD symptoms once the dentofacial deformities have been treated.
- Intermediate and intermediate/late-stage internal derangement cases that do not respond to nonsurgical management should have arthrocentesis or arthroscopy before orthognathic surgery, if possible. Otherwise it is preferable to do the orthognathic surgery and if the symptoms do not resolve, open joint surgery can be done.
- Patients with late-stage internal derangement and significant degenerative joint disease will generally require total joint replacement surgery at the same time as orthognathic surgery to achieve stable skeletal and occlusal relationships.

## INTRODUCTION

Temporomandibular joint disorders (TMDs) often exist at the same time as dentofacial deformities. Some dentofacial deformities may be a result of a TMD, such as idiopathic condylar resorption

or severe degenerative joint disease. Alternatively, these 2 conditions may develop independently. Diagnosis of dentofacial deformities is usually straightforward for oral and maxillofacial surgeons (OMFSs), but diagnosis of TMDs is more challenging.

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## CLINICAL EVALUATION

It is essential to take a good history, including the patient's chief complaint, symptoms, prior orthodontic treatment history, and treatment expectations. **Box 1** shows the pertinent information to be recorded. As these patients are at high risk for obstructive sleep apnea, every orthognathic surgery patient should be screened with the Epworth sleepiness scale and Stop-Bang score questionnaires.

Physical examination is equally important in evaluating the patient. OMFSSs have to be proficient at evaluating patients for both orthognathic surgery and temporomandibular joint dysfunction. **Box 2** shows the overall general information that should be obtained from the physical examination.

It is imperative to obtain all information in "natural head position," as these patients may posture their head "unnaturally" given a myofascial component. It is important to have clinical Frankfort horizontal plane (line from tragus to bony infraorbital rim) parallel to the true horizontal plane.<sup>1</sup>

## RADIOGRAPHIC EVALUATION

Imaging is a key component in patient evaluation. All orthognathic patients need a full set of radiographs (panoramic, lateral, and anteroposterior cephalometric radiographs). When panoramic radiography shows significant abnormalities, such as degenerative joint changes, cone-beam computed tomography (CT) or medical grade CT are useful tools to further characterize temporomandibular joint (TMJ) bony morphology and the joint space. This will confirm any significant condylar resorption or degenerative joint disease in the TMJ. Also, the oropharyngeal and nasal airway can be evaluated, especially when obstructive sleep apnea is suspected.<sup>2</sup>

For patients with a suspected internal derangement, MRI allows evaluation of disk morphology, mobility, and position, along with any synovitis or effusion in the joint (see Tore A. Larheim and colleagues' article, "[The Role of Imaging in the Diagnosis of TMJ Pathology](#)," in this issue). MRI with gadolinium is especially helpful in visualizing and quantifying the amount of synovitis in the TMJ, especially in patients with a history of juvenile idiopathic arthritis.<sup>3</sup>

## CEPHALOMETRIC ANALYSIS

Cephalometric analysis is an important step in diagnosing and treatment planning for patients with dentofacial deformities. Patients with a dentofacial deformity and internal derangement often have an increased occlusal plane angle and clockwise

### Box 1

#### Pertinent history when evaluating patients with dentofacial deformity and temporomandibular joint disorder (TMD)

##### *Chief Complaint*

- Malocclusion
- Esthetic concerns
- Orofacial pain
- Decreased range of motion of jaw
- Functional concerns, such as difficulty chewing and speaking

##### *Dentofacial Deformity-related History*

- Prior orthodontic treatment
- Change in occlusion
- Obstructive sleep apnea questionnaire
  - Epworth sleepiness scale questionnaire
  - Stop-Bang questionnaire
- Growth history

##### *TMD-related History*

- Symptoms
  - Pain
  - Range of motion
  - Clicking, crepitus
- Pain
  - Quality
  - Severity
  - Location
  - Radiation
  - Duration
  - Timing
  - Exacerbating and relieving factors
- Prior treatment
  - Medication
  - Physical therapy
  - Splint therapy
  - Surgery
- Prior trauma history
- Parafunctional habit (grinding, clenching)
- Joint noise (crepitus/clicking)
- History of locking
- Change in occlusion
- Medical comorbidities, such as inflammatory joint disease, autoimmune or connective tissue disease, and so forth
- Jaw function, such as diet
- Disability

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