Temporomandibular Disorders

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Learning Objectives:

- Conduct initial examination and classify patients with TMD.
- Determine plan of care for patients with TMD.
- Perform manual therapy for soft-tissue and joint restrictions.
- Provide patient education for self-management.
Examination

- History:
  - Chief complaint
  - Onset, mechanism of injury
  - Pain behavior patterns
  - Red flag screening
  - Medical interventions
  - Occupation
  - Activities of daily living
  - Recreational activities
Examination

- Specific Questions may include:
  - Pain when talking, singing, yawning or chewing?
  - Clicking, popping or gravel noises in the jaw?
  - The feeling that your jaw catches or locks?
  - Problems opening or closing your mouth?
  - The habit of grinding or clenching your teeth?
  - A recent change in your bite?
  - Splint or night guard?
  - Dental history, including orthodontics?
  - Ear symptoms?
Examination

Specific Questions (cont’d)
- Symptoms change (better or worse) with neck movements?
- Headaches? If yes, where do they start?
- Neck, shoulder, or back pain?
- Whiplash or recent injury to your head or neck?
- Increased stress in your life?
- A history of arthritis or other medical conditions?
- Any prescription or over-the-counter medications, herbs, or supplements?
Examination

- Functional Questionnaires:
  - Jaw Functional Limitation Scale
    - Ohrbach et al, 2008
    - 20 item version with good reliability and validity for assessing limitations in mastication, jaw mobility, verbal and emotional expression
    - 8 item version for assessment of global functional limitation
  - Temporomandibular Disorder Disability Index
    - Streigerwald and Maher, 1997
    - No psychometrics available
Examination

- What is the patient’s goal or expectation?
**Checklist of Psychological and Behavioral Factors**  
*From McNeill 1990 in Dutton 2004*

| ✔  | Inconsistent, inappropriate, or vague reports of pain |
| ✔  | Over dramatization of symptoms |
| ✔  | Symptoms that vary with life events |
| ✔  | Significant pain of > 6 months’ duration |
| ✔  | Repeated failures with conventional therapies |
| ✔  | Inconsistent response to medications |
| ✔  | History of other stress-related disorders |
| ✔  | Major life events (e.g. new job, marriage, divorce, death) |
| ✔  | Evidence of drug abuse |
| ✔  | Clinically significant anxiety or depression |
| ✔  | Evidence of secondary gain |
Examination: Posture

- Sitting and/or standing alignment
  - Occipital protuberance aligned with C7
  - 2 finger-widths of space between base of occiput and C2
  - McGregor’s plane is horizontal
  - Forehead, lips and chin aligned (orthognathic)
    - Retrognathic-posterior
    - Prognathic-anterior
Examination: Posture

- Forward head posture is common
  - Adaptive: greater mandibular depression
  - Maladaptive: functional malocclusion and spasm of the lateral pterygoid
Examination

- Facial symmetry
  - Bottom 1/3 of face = top 1/3 of face
  - Masseter hypertrophy or atrophy
Examination

- Facial symmetry
  - Lat. eye-mouth = nose-chin
  - Alignment of central incisors
Examination: AROM

- Cervical
  - Examine c-spine gross and accessory mobility prior to TMJ
  - Can the patient keep the mouth closed during maximum flexion and extension?
    - During cervical flexion: mandible moves up and forward
    - During cervical extension: mandible moves down and back
Examination

- Mandible AROM
  - Depression-normal opening
    3 Fingers
    ➢ 40 mm
  - Lateral deviation (excursion)
    10 mm
  - Protrusion
    4-6 mm past upper incisors
    (8-10 mm total)
Examination

- Reliability (ICC)
  - Standard Ruler  Walker 2000
    - Depression
      Intra-rater reliability .94
      Inter-rater reliability of .99
    - Lateral deviation
      Intra-rater reliability .75-.92
      Inter-rater reliability of .94-.96
    - Protrusion
      Intra-rater reliability .89-93
      Inter-rater reliability of .98

MDD = 6 mm  Magee 2008
Examination: AROM

- Mandible AROM
  1. Observe
  2. Palpate
  3. Measure

Draw opening/closing pattern. Use “x” to mark joint sounds and “/” to mark end range.
Examination: AROM

- Palpate condylar movement
  - Anterior to tragus over condyle
  - Posterior to tragus behind condyle
  - 1# pressure used to palpate for tenderness
Examination: AROM

- Auscultation
  - Click, pop, crepitus
  - Document when it occurs
  - Painful or not
Examination: PROM

- Maximum Assisted Opening

PT uses thumb on maxillary incisors and index finger on mandibular incisors to assist with moderate pressure.
Examination: Strength

- MMT
  - Grades 0-5/5
  - Qualifiers:
    Strong/pain free,
    Strong/painful,
    Weak/pain free,
    Weak/painful
Examination

- Overpressure (end feel)
  - Normal: tissue stretch
  - Abnormal
    - Hard: osseous abnormalities
    - Springy: displacement of the disc
    - Capsular: adaptive shortening of the periarticular tissues
Examination: Accessory Motions

- TMJ accessory motions
  - Distraction (inferior, caudal)
  - Anterior glides
  - Medial and lateral glides

Medial  Lateral
Examination: Palpation

- Muscle Palpation:
  - 2# pressure for extra-oral, 1# for intra-oral
  - Mandible in rest position without teeth contact
  - Press in multiple areas to locate tenderness
  - Note:
    - Hypertonus
    - Local tenderness
    - Referred pain
Examination: Palpation

- Temporals
  - Posterior
  - Middle
  - Anterior
Examination: Palpation

- Temporals tendon-intraoral along ramus of mandible
  - Use index finger pad
Examination: Palpation

- Masseter
  - Origin
  - Body
  - Insertion
Examination: Palpation

- Medial Pterygoid
Examination: Palpation

- Lateral Pterygoid
Examination: Palpation

- Accessory Muscles
  - SCM, Scalenes, Suboccipitals
  - Ant. Digastrics
  - Hyoid bone mobility (infrahyoids)
Examination: Special Tests

- Jaw reflex: tap examiner’s thumb
- Chvostek Test: tap parotid gland overlying masseter.
  - Positive test: facial muscles twitch. Implicates involvement of CN VII.
Examination: Special Tests

- Bite Test: place cotton roll or double tongue blades between molars and bite gradually; assess pain
  - Ipsilateral pain - muscle/tendon irritation
  - Contralateral pain - capsulitis/synovitis
  - Test both sides to confirm
Diagnostic Value of Orthopedic Tests in TMD  Lobbezoo-Scholte 1993

- Tests Used
  1. Active movement (all directions)
  2. Passive opening
  3. Joint Play
  4. Compression (manual)
  5. Static pain test (MMT)
  6. Palpation (muscles)
Diagnostic Value of Orthopedic Tests in TMD  

Lobbezoo-Scholte 1993

- Distinguish Patient or Control
  - Passive opening (OR 20.6)
  - Active movements and palpation (OR 35.6)

- Distinguish Myogenious or Arthrogenous Patients
  - Active movements (OR 15.36)

- Distinguish Internal Derangement or Osteoarthritis
  - Active movements (OR 80.0)

- Distinguish ID w/ Reduction or w/o Reduction
  - Active movements (288.00)
Evaluation

PT Diagnosis

- TMD Classification (Olson 2009)
  - Capsulitis/synovitis
  - Capsular fibrosis
  - Masticatory muscle disorders
  - Hypermobility
  - Anterior disc displacement with reduction
  - Anterior disc displacement without reduction
  - Osteoarthritis
Evaluation

- Anterior disc displacement with reduction
  - Stage I:
    - Disc slightly anterior, little to no pain.
    - Repetitive trauma begins to deform disc.
  - Stage II:
    - Reciprocal click early in opening and late in closing phase.
    - Loss of integrity of ligamentous and intracapsular structures, ↑ disc deformation and ↑ impingement
    - May develop open lock
Evaluation

- Anterior disc displacement without reduction
  - Stage III
    - Most painful stage
    - Reciprocal click occurs later in opening and earlier in closing
    - Closed lock-disc becomes lodged anteriorly (adhesions)
  - Stage IV
    - Clicking is rare, or single opening click
    - Chronic locking w/ soft-tissue remodeling
    - Ant. displaced disc common, but may be post.
Evaluation

- Osteoarthritis
  - Stage V
    - Radiographic degenerative changes on condylar head and articular eminences
    - Evidence of remodeling and osteophytes
    - Marked deformity and thickening of disc
    - Narrowed joint space
Research Diagnostic Criteria
Dworkin and LeResche 1992

- Axis I: Clinical TMD Conditions
  - Group I: Muscle disorders
    - I.a. Myofascial Pain
    - I.b. Myofascial Pain with Limited Opening (<40 mm)
  - Group II: Disc Displacements
    - II.a. With reduction, normal opening
    - II.b. Without reduction, limited opening
    - II.c. Without reduction, normal opening
  - Group III: Joint
    - III.a. Arthralgia-capsulitis/synovitis
    - III.b. Osteoarthritis-arthralgia and crepitis
    - III.c. Osteoarthrosis-absence of arthralgia with bony changes
Interventions

● Education
  – Rest Position of Jaw and Neck
    ● Tongue tip on top (rugae)
    ● Lips closed
    ● Teeth parted
    ● Erect posture
    ● Diaphragmatic breathing
  – Cervical Posture
    ● Sleep: supine preferred
    ● Work/school/ADLs
Education

● Eating Modifications
  – Soft foods include:
    ● Scrambled eggs
    ● Quiche
    ● Baked fish
    ● Yogurt
    ● Tofu
    ● Mashed potatoes
    ● Pasta

● Soup
● Smoothies
● Milkshakes
● Ice cream
● Applesauce
● Bananas
● Gelatin
Education

- Eating Modifications
  - Don’t bite into foods such as:
    - Whole apples
    - Carrots or celery
    - Corn on the cob
    - Sandwiches with lettuce
    - Hamburgers
  - Cut foods into bite-sized pieces
  - Grind or finely chop meats or other tough foods
Education

- Eating Modifications
  - Avoid hard or chewy foods:
    - Nuts
    - Popcorn
    - Gum
    - Carmel
    - Gummy candies
    - Bread crusts or bagels
    - Ice
Education

- Other Modifications
  - Support your jaw when yawning
    - "Tongue tip on top"
    - Manual support
  - Avoid loud singing or yelling
  - Avoid biting nails or pencils
- For desk workers:
  - Headset
  - Computer monitor at eye level
  - Sit with good back support and don’t slouch
Interventions: Manual Therapy

- Soft tissue techniques
  - Massage – longitudinal, cross friction or circular

- SCM/Scalenes
- Submandibular
- Pterygoids/Masseter
Interventions: Manual Therapy

Myofascial Release – take up the slack and hold (1-2 min)

- Occipital
- Parietal/Temporalsis
- Masseter-elevation
- Masseter-depression
Interventions: Manual Therapy

- Myofascial Release

Ear Pull

That feels good!
Interventions: Manual Therapy

- Joint mobilization
  - Distraction-for pain control, general joint mobility or reduce condylar head if it is displaced
  - Distraction and anterior translation-improve opening and protrusion or reduce an anteriorly displaced disc
Interventions: Manual Therapy

- Joint mobilization
  - Lateral/Medial glides-prep joint for ROM activities, break adhesions, stretch joint capsule or improve lateral deviation.
    - Lateral-thumb on molars (lingual side), fingers on mandible near front teeth
    - Medial-thumb near front teeth (lingual side), fingers on posterior mandible
Interventions: Mobility Exercises

- TMJ rotation and translation control
  - Restore proper tracking to the TMJ
  - Decrease or eliminate clicking, popping or excessive movement
  - Emphasize rotation
    - Phase I: Active assisted-finger on chin and TMJ, tongue on top
    - Phase II: Active-fingers on TMJ, tongue on top
    - Phase III: Fingers in Phase I position, drop tongue at max opening
    - Phase IV: Fingers in Phase II position, drop tongue at max opening
Mobility: TMJ rotation and translation control  “Turn the knob and open the door”
Interventions: Mobility Exercises

- Controlled ROM with Tongue Blade
  - Requires visual cues with mirror
  - Muscle re-ed and AROM post-op
  - Initial training with tongue blade and progress to without
    - Straight opening
    - Lateral deviation
    - Protrusion
Interventions: Mobility Exercises

- PROM
  - Finger assisted method
Interventions: Mobility Exercises

- PROM
  - Therabite
    Atosmedical.com
Interventions: Stability Exercises

- Phase I: one finger resistance in rest position
  - Lateral R and L, up, in, diagonal R and L
Interventions: Stability Exercises

- Phase II: one finger resistance with opening one knuckle width
- Phase III (opt): one finger resistance with opening two knuckles wide
Interventions: Stability Exercises

- Rhythmic Stabilization: resist depression/elevation in neutral
  - Progress to one knuckle width
Rocabado 6x6 Program

6 exercises, 6 reps, 6x/day

1. Tongue Clucks
   Promotes correct rest position

2. Controlled TMJ Rotation on Opening
   Promotes rotation and prevents excessive protrusion

3. Mandibular Rhythmic Stabilization
   Promotes normal position of jaw with proper postural alignment
Rocabado 6x6 Program

4. Upper Cervical Distraction
   Relieve neurovascular compression by distracting occiput from atlas

5. Axial Extension of Cervical Spine
   Normalize posture

6. Shoulder Girdle Retraction & Depression
   Normalize posture
Impairments: Posture-related

- Education
- Soft-tissue mobilization
- Posture exercises
  (Wright, et al 2000)
- Myofacial classification (>6 mos)
- 3 visits
- Signif. improvement in MMO, Sx severity, PPT, perceived improvement
Impairments: Cervical Muscle Endurance

- **Flexors** (Armijo-Olivo, et al. 2010)
- **Extensors** (Armijo-Olivo, et al. 2012)
Interventions: Modalities

- **Home**: heat and/or cold, TENS
- **Clinic**
  - US
  - E-stim: IFC, iontophoresis
  - Spray and Stretch
  - EMG biofeedback
  - Low Level Laser
Interventions: Modalities

- TENS electrode placements
Interventions: Modalities
Post-operative Considerations

- Arthrocentesis
- Arthroscopy
- Arthroplasty with or without Autograft
- Partial or Complete Joint Replacement
Occlusal Splints

- Common intervention used by dentists
- Goal: create single contact for all posterior teeth
- Evidence does not support general use for nonacute TMD, bruxism and headaches