CERVICAL CASE SCENARIO

History and Interview

A 25-year-old female arrives to your physical therapy clinic with complaints of left-sided neck pain that has been ongoing for the past 3 years since starting her job at an investment banking firm. She describes symptoms as a dull ache, sore, and tight and reports that pain fluctuates between 0-5/10. She notes symptoms are aggravated by sitting at a computer for long periods and are worse later in the workday, especially longer days. She states that symptoms are alleviated in the short term if she goes for acupuncture or a massage. She reports feeling better after she does cardio but worse if she does any upper body weightlifting. The patient notes that 3 to 4x/week, she experiences headaches in her forehead and around her left eye, but she attributes this to her eyes being tired from long periods of screen time. She just got new glasses with blue light lenses but is not sure if they have made a difference.

Systems Review

The physical therapist determined that screening of the neurological system was warranted due to patient's complaints of headaches (specific questions re: dizziness/lightheadedness and/or nausea/vomiting accompanying headaches; if headaches occur with neck pain or separately). Clinical evaluation was focused on the musculoskeletal system, with an emphasis on the cervicothoracic region and special attention to reproduction of headache. Evaluation also included cranial nerve screening and vestibular ocular motor screening.

Tests and Measures

Screening of the cranial nerves and vestibulo-oculomotor system were unremarkable. Evaluation of the cervical spine revealed active range of motion (ROM) measurements of 45° flexion that felt like a good stretch, 50° extension with pain at end range, 50° bilateral side bending, 90° right rotation, and 75° left rotation with ipsilateral pain at end range that radiated into the forehead. Shoulder active ROM was within normal limits and painful with glenohumeral elevation. Palpation revealed tenderness and hypertonicity in the left suboccipitals with reproduction of forehead pain and in the left paraspinals, scalenes, and sternocleidomastoid (SCM). The cervical flexion-rotation test was positive to the left for pain and decreased motion. Joint mobility was normal in the mid-cervical spine and hypomobile in the cervicothoracic junction (CTJ) and at levels T3-6. The patient was unable to perform the deep neck flexor (DNF) endurance test without SCM compensation. The cervical extensor endurance test was terminated at 20 seconds due to improper form. Manual muscle testing revealed bilateral non-painful weakness of the mid and lower trapezius.

1. Based on the case information, which of the following is most likely responsible for the patient's presentation?
    a. Cervicogenic headache.
    b. Neck pain with mobility deficits.
    c. Neck pain with movement coordination impairments.

d. Rotator cuff pathology.

The correct answer is **a. Cervicogenic headache.** The patient was experiencing neck pain with related headache that was reproduced with left cervical rotation, palpation of suboccipitals, and positive cervical flexion-rotation test for atlantoaxial joint hypomobility. Additionally, patient presented with poor DNF activation/strength, poor cervical extensor endurance, poor periscapular strength, and hypomobility in the CTJ and upper thoracic regions, which may contribute to this diagnosis. Patient's symptoms are aggravated with sustained postures as well as upper body weightlifting, but reports that movement and soft tissue mobilization help to alleviate symptoms.

2. The patient presents with a positive cervical flexion-rotation test. Please match the joint being assessed with the normal range of motion of this joint.
   a. Atlanto-axial joint; 45° flexion.
   b. Atlanto-axial joint; 45° rotation.
   c. Atlanto-occipital joint; 45° lateral flexion.
   d. Atlanto-occipital joint; 45° rotation.

The correct answer is **b. Atlanto-axial joint; 45° rotation.**

Prognosis and Plan of Care

Clinical examination and additional historical information confirmed the diagnosis of cervicogenic headache, and the patient is deemed appropriate for treatment with physical therapy interventions. An initial home program was provided based upon impairments observed during examination. The patient was instructed to perform the exercises 3x/day as tolerated for 1 week, before following up in clinic. After the first follow-up, the patient was recommended to participate in physical therapy once weekly for 6 to 8 weeks, depending on progress.

Intervention

Her initial home exercise program included self-mobilization (C1-2 self-SNAGs) followed by chin tucks in the supine and seated position for postural re-education and DNF activation. Patient education was provided for ergonomic workstation setup and postural recommendations with emphasis on taking hourly rest breaks from working on computer.

3. Based on the noted impairments, what is the most appropriate initial manual therapy technique to improve the patient's cervical rotation ROM?
   a. C1-2 mobilization.
   b. Cervicothoracic junction mobilization.
   c. Soft tissue mobilization of scalenes.
   d. Stretching of upper trapezius.

The correct answer is **a. C1-2 mobilization.** The patient's examination revealed limited rotation active ROM to the left and a positive cervical flexion-rotation test, which indicates the rotation limitation is likely articular as opposed to soft tissue–related. Cervical flexion-rotation test specifically isolates rotation at C1-2, making a mobilization technique at this level most appropriate for the patient. The

remaining choices could also be beneficial but have not been associated with improvement in ROM due to joint mobility deficits at C1-2.

Outcomes

The patient returned to the physical therapy clinic after 3 sessions of physical therapy over a 3-week period. She regularly performed the prescribed home exercise program and was compliant with all activity modification recommendations. She was reporting less frequent and less intense headaches at the end of the workday, but her neck pain was only slightly improved.

4. You assess the patient's DNF endurance test and she is now able to perform for 10 seconds without SCM activation, which is an improvement from the initial evaluation. You also reassess the cervical extensor endurance test, which has improved to 45 seconds. Which intervention and dosage would be most appropriate at this point in patient's plan of care to improve her neck pain?
    a. Cervical extension in prone on elbows with resistance band; 5 repetitions with 10 second holds.
    b. Chin tuck with lift; 20 repetitions with 5 second holds.
    c. Low rows with resistance band; 2 sets of 15 repetitions.
    d. Prone Ys with dumbbells; 3 sets of 10 repetitions.

The correct answer is **b. Chin tuck with lift; 20 repetitions with 5 second holds.** Patient's cervical extensor endurance exceeds norms for females, but her neck flexor endurance is still below norms for females. Therapeutic exercise targeting endurance of the neck flexors is indicated with parameters consisting of high repetition and low load. Low rows and prone Ys would also be appropriate for the patient given her periscapular muscle weakness at initial evaluation, but these exercises do not target neck flexor endurance.

REFERENCES

1. Blanpied PR, Gross AR, Elliott JM, et al. Neck Pain: Revision 2017. *J Orthop Sports Phys Ther*. 2017;47(7):A1-A83. doi:10.2519/jospt.2017.0302
2. Joona A, Sannasi R, Naik H, et al. Normative values of neck extensor endurance test in young adults. *J Bodywork Movement Therapies.* 2024;40:1567-1570. doi:10.1016/j.jbmt.2024.08.008