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Analytical Essay

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Introduction

The purpose of this paper is to analyze the history and examination processes of a given patient to develop a provisional classification using Mechanical Diagnosis and Therapy (MDT).

History

The known risk factors associated with neck pain are a previous history of neck pain, female gender, increasing age up to 50, headache, back pain, distress, heavy or repetitive work, sitting, and neck flexion (McKenzie and May 2007; Ariens et al. 1999; Ariens et al. 2001; Leclerc et al. 1999; Makela et al. 1991; Cote et al. 2000). This patient demonstrates 5 of the 9 known risk factors for neck pain: female gender, age, repetitive work, sitting, and neck flexion. Sitting and part time office work are associated with forward head posture and neck flexion, both of which have been implicated in developing neck disorders (McKenzie and May 2003; Ariens et al., 2001). Furthermore, Menon and May (2012) demonstrated that cervical disorders can be a common source of shoulder pain. High prevalence rates of centralization have been found in patients with back and neck pain. May and Aina (2012) reviewed 29 studies that included 4745 patients with back and neck pain and found the prevalence rates of centralization ranged from 11%-89%, the average was 44.4%. Given this patient's risk factors for having a neck disorder and the prevalence rates of centralization, the cervical spine should be examined first to be ruled in or out. If the shoulder were to be examined in the presence of a neck disorder causing shoulder symptoms, false positives could distort the clinical findings. This clinical reasoning in the patient's history led to the inclusion of the neck in the examination as a possible source of pathology to be ruled in or out. Other risk factors not demonstrated in this patient's history include a previous history of neck pain, headache, back pain and distress. The patient has denied parasthesias and numbness in the right arm, denied any prior history of neck problems, and denied any problems with neck movements or positions. Further, she reports her symptoms began in the right shoulder and have not changed location for 2 months. Although this is not conclusive of a shoulder disorder, it increases the likelihood of a shoulder disorder, and warrants a right shoulder examination if the cervical spine were to be ruled out.

McKenzie and May (2000) outline the key factors of the inflammatory phase of healing as constant pain, shortly after onset (traumatic or insidious), cardinal signs (swelling redness, heat, tenderness), lasting aggravation of pain by some or all movements, and no movement found which reduces pain. It has been suggested that inflammation typically lasts 48-72 hours from the duration of injury (ACPSM 1998). The possibility of right shoulder inflammation is unlikely as there is no patient history of trauma, no resting pain and a duration of two months. The chronic stage has been defined as greater than 7 weeks (McKenzie and May 2000). A more rigorous exam may

be possible, given this patient's stage of healing, no current functional limitations, and a decreased likelihood of inflammation. There are no red flags found in the history that might contraindicate a mechanical examination.

May and Ross (2009) outline an extremity postural syndrome as pain produced by sustained loading that, once avoided, the rest of the physical examination would be normal. During the history section, postural dysfunction cannot be reasonably ruled out as the patient has pain during activity that stops with rest, and the two month duration since onset would allow for the inclusion of this syndrome. Contractile dysfunction is identified by intermittent pain consistently produced by loading the musculo-tendinous unit. This patient complains of pain during activity which ceases at rest, therefore, contractile dysfunction cannot be completely ruled out by the history. May and Ross (2009) describe an articular dysfunction as intermittent pain consistently produced at a restricted end range with no rapid change of symptoms or range of motion. A 2 month duration is ample time to allow for adaptive tissue shortening, as a result, an underlying right shoulder dysfunction cannot be completely ruled out (McKenzie and May 2000). Finally, an extremity derangement syndrome is described as the abolition or decrease of symptoms, and/or increase in restricted range of movement in response to repeated movements. May and Rosedale (2012) collected data on 388 patients that had been classified into one of the extremity classification categories by 30 therapists holding an MDT Diploma. They found the shoulder derangement syndrome demonstrated the second highest prevalence rate of 42.5%, with internal rotation (49%) and extension (25.5%) being the most dominant directional preferences. In the presence of a derangement syndrome, motions that are the opposite of the directional preference have a tendency to cause symptomatic and/or mechanical deterioration (McKenzie and May 2000). In this patient's history, shoulder flexion and external rotation are described as activities that produce or worsen the condition. Shoulder flexion and external rotation are the opposite directions of shoulder extension and internal rotation. This finding in the history suggests two possible clues: 1) classification: right shoulder derangement and 2) directional preference: right shoulder extension and internal rotation. As a result of these findings in the history, if the cervical spine were to be ruled out during the examination, then the shoulder should be examined for the presence of a derangement. Since derangements can mimic dysfunctions, if the shoulder were to be examined for dysfunctions in the presence of a derangement, false positives could distort the clinical picture.

Considering the history section of this assessment, the possible MDT classification syndromes are:

I. Cervical derangement syndrome
II. Right shoulder derangement syndrome
III. Right shoulder contractile dysfunction syndrome
IV. Right shoulder articular dysfunction syndrome
V. Right shoulder postural syndrome

One finding seems clear, this patient has intermittent right shoulder pain of mechanical origin. McKenzie and May (2000) describe this as pain during loading that ceases when the loading is stopped.

Examination

At the beginning of the examination the patient demonstrated a “concordance sign” by lifting a heavy bag which was painful. This “concordance sign” could be used as a functional baseline for the patient and clinician to help guide the examination and measure progress on subsequent visits. Right shoulder baseline active movements testing revealed the most symptomatic and mechanically restricted direction was internal rotation (IR) or hand behind back (HBB), which had a moderate loss of motion (wrist to sacrum) and had pain during motion (PDM). Baseline resisted test responses of right shoulder flexion, ER, and abduction were all mildly painful. In this case, after all baseline data are collected regarding the right shoulder active range of motion (AROM), passive range of motion (PROM), and resistive tests, the examination should begin with the cervical spine. Given this patient’s history, associated risk factors, her report of getting worse, and the prevalence rates of centralization in the spine, an MDT examination of the cervical spine is warranted (Aina et al. 2004; May and Aina 2012). Examining the right shoulder first, in the presence of a cervical derangement syndrome, could generate false positives and cloud the clinical picture. In this case, if the cervical spine motions were found to be restricted and/or painful, a repeated motions examination of the cervical spine would need to be performed. If the right shoulder baseline pain and restrictions were significantly altered as a result of cervical spine repeated or sustained end range or midrange motions, a management program for the cervical spine would need to be employed first, and further investigation of the right shoulder, if indicated, could be pursued on subsequent visits. Cervical derangement syndrome was ruled out as all cervical movements were full and pain free.

According to McKenzie and May (2000) peripheral joint derangements can be caused by “internal dislocation of articular tissue which obstructs movement attempted towards the direction of displacement.” The baseline active and passive movement examination revealed that hand behind back (HBB) was the most obstructed motion. This mechanical restriction or obstruction is consistent with the directional preference (DP) of right shoulder extension and internal rotation that has been demonstrated as the most dominate DP in shoulder derangement syndrome (May and Rosedale 2012). Given this pattern recognition clinical reasoning, HBB, the most obstructed motion, was chosen to test first during the repeated motions examination. Repeated right HBB decreased pain and increased motion. This symptomatic and mechanical response indicated a green light for further force progression testing. Further, repeated right HBB with patient over-pressure abolished all pain and restored full AROM in right shoulder HBB, abduction and ER. This rapid symptomatic and mechanical response revealed HBB as the directional preference and identified the MDT classification as right shoulder derangement syndrome. Consequently, repeated right shoulder ER caused the pain to return and decreased right shoulder HBB, abduction and ER motions. This rapid deterioration in symptoms and mechanics confirmed HBB as the directional preference

and right shoulder derangement syndrome as the classification. Therefore, “repeated movements that increase the displacement also increase the obstruction that in turn increases the pain” (McKenzie and May 2000). Another interesting symptomatic response in this case was that during the movement of right shoulder ER there was no effect (no pain), although afterwards, the patient was worse. McKenzie and May (2000) postulate that this “opening” of the joint space temporarily reduces the pain, however, promotes greater displacement. Avoiding right shoulder ER could be given as a precaution, to allow full reduction and stabilization of the derangement, and confirm classification on the second visit. As a result of the rapid symptomatic and mechanical responses, i.e. completely abolished pain and full restoration of pain free AROM, the cervical spine, right shoulder contractile, articular and posture dysfunctions can be ruled out.

Conclusion

There are consistent mechanical and pain patterns associated with each syndrome (McKenzie and May 2003; McKenzie and May 2000). Pattern Recognition or forward reasoning is dependent on adequate domain knowledge (Doody and McAteer 2002). This domain knowledge of each syndrome provides MDT clinicians with enhanced pattern recognition skills. As in this case, when a derangement syndrome is suspected, it must be ruled out first due to it’s rapid ability to change the patient’s pain and overall functional status. Ruling out the derangement first helps minimize false positives that might lead to misclassifications, as derangements tend to mimic other classifications. Once a derangement has been fully ruled out, we realize this is not a rapidly changing condition, then other classifications can be more clearly ruled in or out. Once properly classified, proper treatment can ensue. During the examination, right shoulder posture, articular and contractile dysfunction were reasonably ruled out while ruling in or out a shoulder derangement. The patient’s directional preference, was suspected in the history and confirmed during the examination. When the directional preference was applied with the appropriate loading strategy, all symptoms were abolished, reasonably ruling out the possibility of any underlying dysfunctions. On subsequent visits the patient’s concordance sign (lifting a heavy bag) and other baseline data collected could be retested to determine if any underlying contractile dysfunction exists that may need management. Once the patient’s symptoms have resolved and the derangement appears stable, the deranging motion (ER) could be tested to understand the integrity or stability of the healing process. Finally, all right shoulder end range motions could be tested to ensure no underlying articular dysfunctions exist that might require management.

In this case, a self management strategy was discovered during the examination using pattern recognition and hypothetic-deductive clinical reasoning. Evidence based practice principles such as tissue (symptomatic) response techniques (end range loading strategies), directional preference and centralization were used to guide the process (McKenzie and May 2000; Aina and May 2005; Dekkers and Gustaitis 2011; May and Rosedale 2012). Using MDT in this extremities case revealed how proper history taking and examination can provide provisional classification and management determination simultaneously.

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