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Case report

Costochondritis: Are the symptoms *and signs* due to neurogenic inflammation. Two cases that responded to manual therapy directed towards posterior spinal structures

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1. Introduction

Approximately 50% of patients attending accident and emergency departments and outpatient cardiac clinics because of chest pain have a non-cardiac basis for their symptoms. They are often given a non-specific diagnosis (Mayou et al., 1997; Capewell and McMurray, 2000). One possible diagnosis these patients may receive is costochondritis. Possible causes of costochondritis will be discussed and a group of these patients delineated for whom there is no documented underlying pathophysiology. This paper then presents two such case reports and goes on to question whether costochondritis is simply localised anterior chest wall pathology. It is considered whether positive responses to manual therapy directed towards the spine and posterior rib articulations are indicative of a more widespread neuropathic contribution to the condition.

2. Pathophysiology

There is no clear definition for costochondritis (Wadhwa et al., 1999). Therefore, making the diagnosis of either idiopathic costochondritis or Tietze's syndrome is predominantly based upon clinical findings, and often occurs following the exclusion of other potentially serious or systemic pathologies (visceral pain, infection, etc.) that may give rise to chest pain. Laboratory investigations and imaging are usually normal (Wadhwa et al., 1999). Tenderness localised over the costochondral joints may be the only clinical finding in costochondritis, whereas in Tietze's syndrome there may be associated swelling, heat and erythema (Scott and Scott, 1993; Mendelson et al., 1997). The underlying pathophysiology relating to this tenderness or swelling has not been documented.

It has been suggested that the costovertebral and costotransverse joints are commonly overlooked sources of atypical chest pain and there are a number of case reports detailing manual therapy treatment for this type of presentation (Fallon, 1996; Triano et al., 1999). However, the author was unable to find any reports of manual therapy, directed at the zygapophyseal and posterior rib articulations, being utilised as an effective treatment in cases where both localised anterior tenderness and costochondral swelling were present.

3. Presentation

3.1. Case one

3.1.1. Patient interview and history

A 29-year-old female physiotherapist presented with a 10-week history of insidious onset central chest pain described as a constant dull ache or squashing sensation, with an intensity of 3 out of 10 on a visual analogue

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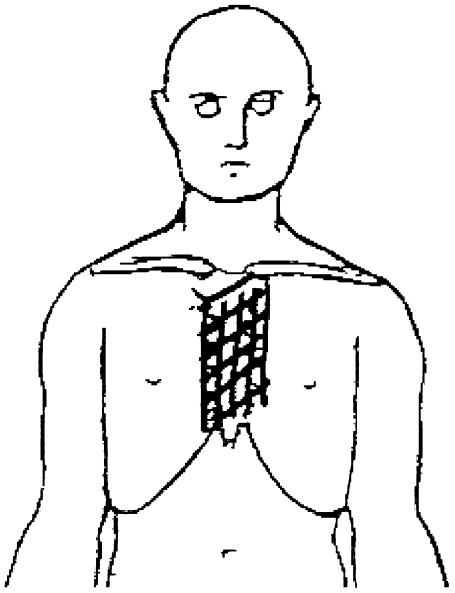

Fig. 1. Body chart showing painful area—case one.

scale. There was no posterior thoracic pain. (See Fig. 1.) Aggravating factors were lifting, pushing and deep breathing.

Symptoms could be eased with ice packs, taking non-steroidal anti-inflammatory medication and through the maintenance of flexed thoracic posture during activities. MRI scanning did not reveal any abnormality. Both the patient's general practitioner and consultant orthopaedic surgeon had diagnosed costochondritis. There was no other relevant medical history.

3.1.2. Physical examination

Observation revealed subtle swelling over the right sternocostal and upper costochondral joints. There was greater right rhomboid muscle bulk than left. Thoracic spine flexion, extension and left side flexion were all of full range and pain free. Right side flexion showed full range of movement with provocation of chest pain at the end of range. Thoracic rotation was estimated visually as the angle made by the trunk at shoulder level when compared to the initial position and that of the fixed pelvis with the patient sitting. Left rotation was 35° and right rotation 45° with both movements being described as "stiff" by the patient. During passive physiological motion palpation right rotation and right side flexion appeared to be restricted at the T1-2 and T2-3 levels. Movement between the second and third ribs also appeared restricted on passive motion palpation. Palpation over the right articular pillar of T3 and the third rib angle provoked localised allodynia but not referred symptoms. Resisted glenohumeral lateral rotation and flexion on the right were both provocative of anterior chest pain and were notably weaker than the contralateral side. Assessment of motor control in the scapula region revealed weakness in the right serratus anterior and dominance of right rhomboid activity.

3.1.3. Treatment

During the first treatment session, a passive oscillatory postero-anterior mobilisation was applied over the right articular pillar of T3 and over the angle of the third rib. An improvement in both pain and strength on resisted shoulder flexion was gained. One week later the patient volunteered that squeezing objects was a reliable indicator of symptom severity. Range of motion of thoracic rotation remained unchanged. Further mobilisation was applied over T3 and the third rib. The patient expressed an immediate subjective 50% reduction in pain intensity whilst squeezing a large object. A week later the patient reported an overall decrease in pain intensity and greater functional use of the right upper limb. Squeezing the same large object was not provocative. However, lifting a 5 kg weight in either hand provoked chest pain. Further mobilisation was carried out as in previous sessions. Within the same treatment session a T2-3 supine high velocity thrust was administered. This was followed by a SNAG over the right third rib angle with the patient turning into right thoracic rotation as this was the most restricted movement at this stage of the treatment. This lead to a significant improvement in lifting the 5 kg weight, and left and right rotation were both 55° and pain free. Right thoracic side flexion was full range and pain free. On the fourth treatment session seven days later, the patient reported no pain during her normal work duties. Lifting 10 kg with the left hand was not provocative but was with the right hand. Further mobilisation and a repeat of the above manipulation were carried out. Left and right thoracic rotation increased to 70 degrees. Upon review six weeks later the patient stated that she was pain free, but approximately two weeks after that had a degree of recurrence due to heavy lifting at work. Over the following four weeks a further two sessions of the abovementioned mobilisation were undertaken which again cleared the symptoms. As a maintenance programme during this period exercises to restore appropriate motor control in the scapula region were prescribed and these were progressed over the next three months. During this time the patient remained symptom free.

3.2. Case two

3.2.1. Patient interview and history

The second case is a 33-year-old female photographic processor. She had episodic insidious onset chest pain for 18 months. She had been diagnosed by her general practitioner as having costochondritis due to palpable swelling over the third and fourth costochondral joints on the left. She described a dull ache, 6 out of 10 on a