

A CASE STUDY

THE IMPORTANCE OF A COMPREHENSIVE ASSESSMENT IN THE TREATMENT OF THORACIC PAIN

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INTRODUCTION

Pain from ligamentous capsular and myofascial structures as well as from facet joints and the dura mater can be referred to areas distant from their source, that is, produce somatic referred pain^{1,2,3,4,5}. It is the purpose of this study to illustrate the need to assess the spine below as well as above the area of pain, if the source of this somatic referred pain is elusive. In the thoracic spine it is very possible that this may be the case since the basic anatomic information of the enervative and referral patterns of this region is incomplete, rendering a theoretical diagnosis the best possible means of accounting for the pain syndromes encountered³.

In the cervical and lumbar regions of the spine, diagnostic blocks and provocation radiology have been used to establish regular somatic-referral patterns. That is, structures suspected of being the cause of pain have been infiltrated with local anaesthetic and pain relief used to implicate the injected structures as the source of the pain⁶. These techniques are the only available means of objectively confirming the cause of pain suspected on clinical examination, but no such work has been done or reported in the thoracic spine^{2,3,6}. Thus, since not enough is yet known about exact referral patterns in this area, careful examination is even more essential.

According to Cyriax, a unique characteristic of dural compression is the "appearance of a localised tender area within the region of false reference^{5,pg20} – a trigger point^{3,7}. Further, according to Travell: "the spontaneous pain (from a trigger point) is rarely located at the trigger point responsible for it. Just as pulling the trigger of a gun affects a remote target, so activation of the trigger point projects pain to a distant reference zone"^{4,pg13}. This referred pain may be low grade and dull or "incapacitating torture"^{4,pg13}, and may occur at rest or only on motion. The finding of a tender area over the area of pain should not mislead the examiner, as this may be referred tenderness that is being palpated. Treatment directed at re-

ferred tender points will be ineffective. Examiners should seek to reproduce exactly the symptoms of which patients are complaining. If treatment is directed at the source of the problem, excellent results can be achieved^{1,2,3}. Thus in the thoracic spine it is important to allow theoretical knowledge and clinical findings to enhance one another and not be hindered by total reliance on either one alone³.

CASE STUDY

Present History

A thirty-four year old female computer programmer presented, complaining of a small area of severe pain felt on the left side of the subscapular region (Figure 1). She had a sedentary job, which involved very long hours of sitting. She had a two year old child whom she lifted and carried quite frequently. She jogged four times a week (four kilometres at a time) and played action cricket once a week for recreation.

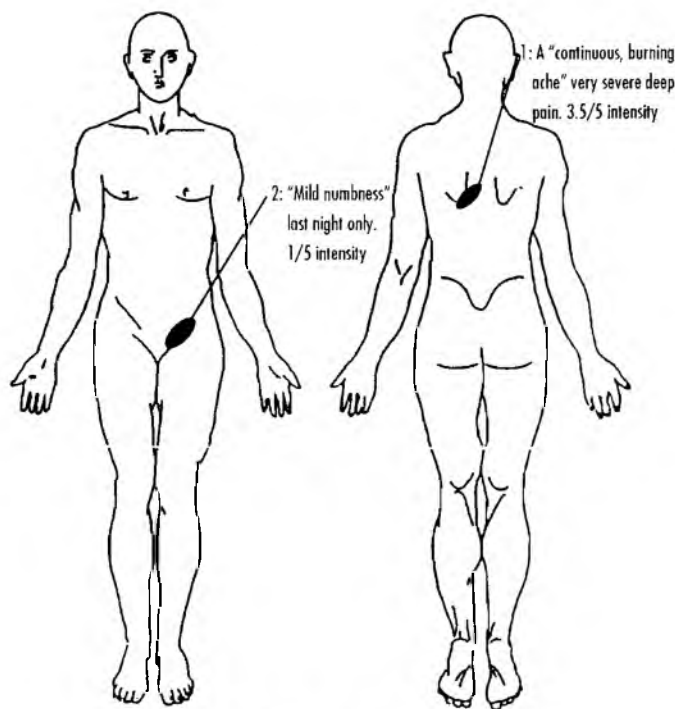


Figure 1. Body chart

ABSTRACT

A case study is presented where unilateral left subscapular pain was treated by mobilisation to the first lumbar segment, as assessment according to the Maitland concept revealed this to be the source of pain. In the treatment of spinal pain, assessment needs to be systematic and where necessary, should include the whole spine, if treatment is to be specific and effective¹.

OPSOMMING

Hierdie is 'n gevalle studie waar unilaterale linker subskapulêre pyn behandel is deur mobilisering van die eerste lumbale segment. Hierdie segment is as die oorsaak van die pyn erken na ondersoek gebaseer op die Maitland konsep.

Waar pyn sy ontstaan in die werwelkolom het, is 'n sistematiese ondersoek noodsaaklik. Indien nodig, moet dit die hele werwelkolom insluit om 'n spesifieke en effektiewe behandeling teweeg te bring¹.

She described the pain as a "continuous burning ache," three and a half out of five on a five point pain rating scale 3,5/5. (Figure 1). The aching was qualified as continuous in nature and seemed to be deep seated. The pain (1) was more intense in the evenings and the patient complained of night pain which woke her, but only with movement. Supine was the most comfortable position for sleeping.

Deep breathing and coughing increased the pain to an unbearable intensity. The pain increased to 4,5/5 within ten minutes of sitting. Bending and lifting her child also produced a sharp increase in the pain as did getting into and out of the car. Nothing that she was aware of relieved the pain. The condition was not irritable.

The patient mentioned a mild numbness 1/5 intensity felt in the groin (L1 dermatome) which she had noticed the pre-

vious evening, lasting for about half an hour. It has come and gone spontaneously; nothing had relieved or aggravated it.

Three days previously she awoke with slight dull subscapular pain. She was unaware of any injuring incident; although she felt the problem had been caused by action cricket played three days prior to the onset of the pain. The pain had increased in intensity until the previous evening when she had called in "agony" for an appointment. She had been advised to rest in bed with a hot pad, supine with a pillow under her knees and to come in the following morning.

Past History

The patient had an ongoing history of low back pain since the birth of her baby. This pain had been untreated until six months ago, when she first consulted the author. The L4-5 facet joint on the right had been found to be symptomatic and had responded to unilateral, Grade IV mobilisation¹. The pain had not recurred. Four months previously the patient had presented with an "acute neck" diagnosed to be discogenic in origin. C4 was the level implicated. It was treated effectively with mobilisations and traction. There was no other past history of note.

Examination: Observation

On observation, she had an increased thoracic kyphosis and an exaggerated lumbar lordosis with a slightly poking chin⁸, tight pectoral muscles and slack abdominal muscles, although she was a lean woman. She undressed with caution and was in obvious pain.

Cervical Movements

Cervical movements were tested first and were all found to be full range and pain free, except for the lower cervical quadrant test which produced quite severe discomfort in the central neck area about the level of C4-5.

Thoracic Movements

Spontaneous forward flexion was from the hips with head held up and back straight. A sharp increase in pain was produced when the movement was corrected. Thoracic movements were more limited than the cervical movements. No test movement significantly increased the constant subscapular pain except for left side flexion which was not as painful as was anticipated.



Figure 2 Left side flexion

Lumbar Movements

On the basis of the reported numbness of the previous evening, it was decided to examine the lumbar spine as well in order to find a true objective comparable sign. Lumbar flexion was grossly limited (fingertips to top of patella = 0,5 of the range of movement) and was performed in the same manner as thoracic forward flexion described above. Slight correction of head position into flexion produced a dramatic increase in the subscapular pain. Extension was very limited (0,25 of the range of movement) and slightly increased the subscapular

pain. Left side flexion produced 5/5 pain when the fingertips reached half way down the thigh (0,25 of the range) (Figure 2).

Most of the movement occurred in the upper thoracic region. Marked stiffness was evident at the thoraco-lumbar junction.

Although the objective examination had been extensive, despite all the movement, the constant pain had not increased except momentarily. Each test movement performed had been crucial to making an accurate diagnosis. It was decided to leave the tension tests for the following day as the examiner already had an accurate indication that neural tissue was involved as the subscapular pain was markedly worsened by the addition of even slight neck flexion, which would increase the stretch on the neural tissue. An upper and lower limb neurological examination had revealed nothing abnormal. Thoracic sensation was also normal. An objective comparable sign had been easy to find – left side flexion.

Palpation

On palpation, tenderness and trigger points were found over the painful area, but nothing else of note was revealed in the thoracic spine. In the lumbar spine, protective muscle spasm was found over the L1-L2 paraspinal area on the left and was painful even on gentle pressure over this area.

Tightness and thickening were noted, as six months previously, over the L4-5 and the L5-S1 facet joint structures on the right.

Central, unilateral and transverse pressure¹ on T6-12 vertebrae produced no effect on the pain. Unilateral pressure on L1 on the left produced a "jump" response^{4,pg3,7,pg23} and intense pain 5/5 from the commencement of the movement. Central and transverse pressure on this same joint, produced a less violently painful, but similar response when movement was taken slightly into resistance (IV – 1^y) for one second.

Treatment

Treatment on day one was limited since so much movement had already been produced during the examination. As described by Maitland¹ extremely gentle, rhythmical and smooth transverse pressures towards the left were performed on the L1 transverse process, short of any resistance, for 30 seconds. The patient was reassessed – the continuous subscapular pain was less intense 2,5/5 and left side flexion had increased to 0,5 of the range, but was still limited by the severe subscapular pain 4/5. The procedure was repeated for a further 90 seconds, after which there was still more improvement and deep inspiration no longer increased the pain. Side flexion to the left was still 0,5 of the normal range, but produced less severe pain 3/5. The treatment was followed by fifteen minutes of interferential therapy in right side lying over two pillows to further open the L1 facet joint on the left¹ (Figure 3). The patient was advised to sit for short periods only and to lie in right side lying over a pillow to continue the opening of the L1 facet joint at home.



Figure 3 Interferential in side lying

The following day the patient presented with low intensity 1,5/5, constant subscapular pain and reported feeling like a

“new person”. The subscapular pain (Figure 1:1) had returned to 3,5/5 intensity the previous evening. She had been able to sit for 90 minutes before this pain had increased, and deep breathing produced only a marginal increase in pain. Left side flexion was still only to the knee and painful 3/5, but forward flexion was much improved to mid-shin and produced only a slight increase in pain. In view of this favourable response, the treatment was repeated using small amplitude movements slightly into resistance (IV)¹ for five sets of 30 seconds each. Reassessment at this point revealed that the continuous subscapular pain had cleared and even deep breathing did not bring it back. Left side flexion was full range (two fingers below the knee) and produced minimal pain, only when the position was sustained for ten seconds. The technique was repeated on the T12 spinous process and the L2 transverse process using small amplitude movements at the end of range (IV+). Trigger point therapy was used to the quadratus lumborum and erector spinae muscles where tender points were found. Most of the tenderness found previously, over the painful area has gone.



Figure 4 The slump test

No treatment was given on the third day. The last treatment was on the fourth day. The patient was pain free on arrival, and lifting her child no longer produced any pain. Left side flexion

was completely clear even with over pressure. Flexion felt “loose” and was pain free except with passively enforced neck flexion. The “slump test” (L3;10) was performed at this stage and was found to be positive especially on left knee extension (Figure 4). It was decided that since the patient had not flared up with treatment that a vigorous technique could be used and the patient was placed into the “slump” position and held quite firmly while left knee flexion and extension were performed slightly into resistance 60 times, with continued reassessment during this period. Reassessment, after the performance of the technique, revealed a marked increase in flexion – fingertips touched the floor.



Fig 5 The cat stretch

The patient was shown a home exercise programme and discharged, knowing she should return at the slightest return of pain. The programme included much of what she had been shown six months before at the previous episode and was therefore extensive. She was asked to apply the “slump” treatment to herself for 30 seconds a day and to “cat stretch” right into lateral flexion, by walking her hands to the right side (Figure 5) in order to mobilise herself

as had been done with the treatment. She was retaught back extensor and abdominal muscle strengthening as well as the strengthening of the lower and middle fibres of the trapezius muscles, in order to improve her posture. Lastly she was reminded of previous advice as regards kinetic handling especially when lifting her child, ergonomics and the dangers of prolonged sitting and the need for hourly “McKenzie extension” exercises^{9,2}.

Telephonic follow up three weeks later found the patient feeling well and exercising as instructed. She was leaving for Australia, thus preventing further follow up. There has been no flare up from the vigorous stretching at the last session.

DISCUSSION

This study is based on the Maitland concept, the keystones of which are: the need for continuous analytical assessment and the relationship between joint movement and pain response¹. The results are a clear cut demonstration of how: “Assessment is the key to success”^{1,11} and it may be clearly seen from this study that the whole spine may need to be assessed and that treatment should not commence until the patient’s exact pain has been reproduced. Treatment of the area of referred tenderness established on palpation would have produced unsatisfactory results. The merits of a thorough subjective assessment can also be seen from this example, as the patient had given the clue to the source of the symptoms by indicating that she had had numbness in the L1 dermatome the previous evening. This important fact would have been missed had the information not been carefully documented.

On the basis of the assessment, it was diagnosed that the L1 motion segment was responsible in some way for the left subscapular pain. This diagnosis was confirmed by the fact that the patient was quickly and completely relieved by the treatment administered. A future study could be to use an anaesthetic block, injected into specific structures of the intervertebral segment, in order to ascertain exactly what component was producing the symptoms^{3,6}.

There is little data on the topic of thoracic pain. Insufficient studies have been done on thoracic pain patterns, therefore pain in the thoracic region poses many diagnostic difficulties in that there is no consistent documented location for referred pain from a particular segment. The area of referred pain can therefore not be used to deduce the exact segmental location of its source^{8,9}. More studies of this nature need to be undertaken in order to establish thoracic pain patterns and possible sites for pain referral.

Two tissues are suggested as possible sources of the unusual pain referral, in this case namely: neural tissue and the myofascia. Firstly, the dura may have become adhered or tight as a result of both the previous neck and back problems. This may have produced an immobility problem, resulting in trigger points^{4,5,7,12}. This dysfunction may have predisposed the patient to become symptomatic without an injuring incident. The already tight and potentially symptomatic dural sheath could have been irritated by traction or inflammatory reaction chemicals. A discogenic, ligamentous, or capsular swelling at the L1 intervertebral level may have produced the traction effect on the membrane^{3,5}. Chemicals produced by the inflammatory reaction of an inflamed and damaged joint may have irritated the chemo-sensitive dura². The T6 vertebra, is the physiological tension point of the thoracic dura¹³, therefore the mid thoracic spine may have been the area most affected by the dural irritation. This would explain why pain emanating from the L1 motion segment was felt in the subscapular region. Secondly, afferent discharge from a diseased or damaged joint

namely L1, may cause a latent trigger point to become active. This may cause "agonising incapacitating pain"^{4,pg6}. Reflex, protective splinting of muscles around a painful joint perpetuates this cycle, reactivating trigger points and bringing other trigger points into action^{4,7,12}. The muscles and fascia involved include, iliocostalis and longissimus², latissimus dorsi and the thoracolumbar fascia or erector spinae aponeurosis, among others¹⁴. Thoracic longissimus as well as thoracic iliocostalis affect both the thoracic and lumbar regions as they originate in the thoracic spine and insert into the lumbar spine and pelvis. Both contribute to the action of side flexion – the most painful movement for this patient. According to Travell, contraction of a muscle containing a trigger point produces pain⁴.

The mechanoreceptor stimulation associated with manipulative procedures, such as transverse pressures are used in the study, produces presynaptic inhibition of nociceptive afferent transmission¹⁵ and, in this way, could be responsible for relieving the patient's pain. This technique was chosen as more movement could be produced on the contralateral side, because the ipsilateral side was so tender, and the aim of the treatment was to "open"^{1,pg286} the joints which were painful when closed – that is when the patient side flexed to the left. Treatment objectives could be achieved, even without a confirmed diagnosis.

CONCLUSION

Assessment must be thorough if treatment is to be effective. It appears from this case study that the L1-2 motion segment may refer pain upwards towards the subscapular region. Al-

though the mechanisms for this are not documented, two possible explanations are suggested. Further studies are required before this can be properly proven and understood.

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