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. 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 encountered.

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 pain. 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. 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” – a trigger point. 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.” This referred pain may be low grade and dull or “incapacitating torture,” 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 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. 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 alone.

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.

She described the pain as a “continuous burning ache,” three and a half out of five on a five point pain rating scale. (Figure 1). The aching was qualified as continuous in nature and seemed to be deep seated. The pain 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 pain had been caused by action cricket played
three days prior to the onset of the pain. The pain had in­
creased 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 mobilisation. 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 his­
tory of note.

Examination: Observation

On observation, she had an increased thoracic kyphosis and
an exaggerated lumbar lordosis with a slightly poking chin,1
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 move­
ments were more limited than the cervical movements. No test
movements significantly increased the constant subscapular
pain except for left side flexion which was not as painful as
was anticipated.

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 previ­
sely, over the L4-5 and the L5-S1 facet joint structures on the
right.

Central, unilateral and transverse pressure1 on T6-12 verte­
brae produced no effect on the pain. Unilateral pressure on L1
on the left produced a "jump" response2,3,4 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) for one second.

Treatment

Treatment on day one was limited since so much movement
had already been produced during the examination. As de­
scribed by Maitland3 extremely gentle, rhythmical and
smooth transverse pressures towards the left were per­
formed 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 improve­
ment and deep inspiration no longer increased the pain. Side
flexion to the left was still 0.5 of the normal range, but pro­
duced 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 left3
(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.

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) 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.

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 left "loose" and was pain free except with passively enforced neck flexion. The "slump test" (1;3;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 to head height.

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 taught 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.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"1,10, 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 quick 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.53

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.52 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.15,17 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 produce the traction effect on the membrane.5,17 Chemicals produced by the inflammatory reaction of an inflamed and damaged joint may have irritated the chemo-sensitive dura.16 The T6 vertebra, is the physiological tension point of the thoracic dura,17 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...
CONCLUSION

assumptions incapacitating pain4,10,15. Reflex, protective splitting of muscles around a painful joint perpetuates this cycle, reactivating trigger points and bringing other trigger points into action4,12. The muscles and fascia involved include, iliocostalis and longissimus2, latissimus dorsi and the thoracolumbar fascia or erector spine 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” 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.

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References