43. Deep-seated low back pain – a triad of symptoms for pelvic instability

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INTRODUCTION

Low back pain is ubiquitously experienced by most adults at some time during their life. Such pain is frequently of short duration, probably involves soft tissues, and may not come to attention of the medical profession unless compensation of some kind is involved.

Owing to modern imaging techniques, much attention has recently been paid to compression of the nerve root by a herniated disc and zygapophyseal joint arthropathy as being readily defined sources of low back pain (Jackson et al 1988, Mooney 1987). However, pain arising from these two sources accounts for no more than 30% of cases of low back pain. This means that a significant amount of low back pain has no defined pathological cause. Partly to blame for this dilemma is the inadequate undergraduate teaching given to musculoskeletal dysfunction in our medical schools, where undue emphasis appears to be placed on referred pain being due to nerve root compression (Kirkaldy-Willis & Hill 1979). To improve diagnosis in low back pain, more attention needs to be given to taking a good history and performing a competent clinical examination, which should appropriately reproduce the patient's pain.

It is unfortunate that, throughout the world, there are patients suffering genuine musculoskeletal pain that is unable to be substantiated by recognized pathology, and that in the process of examination, these patients have not had their pain reproduced. After all, it is this pain which has brought the patient to the doctor. It is therefore incumbent on the practitioner to reproduce the pain, preferably by movement and palpation of the structures involved. If in doubt, the area can be blocked by local anesthetic, under image intensification if necessary, thereby at least establishing the existence of the pain and its site.

All musculoskeletal practitioners have been faced with difficult diagnostic challenges concerning patients with chronic musculoskeletal pain who have been told by surgical specialists that their problem is largely functional because radiology has failed to identify the lesion. The patients frequently report that the clinical examination was superficial. These patients become frustrated and disillusioned by the medical profession and begin to shop around for explanations that are likely to add further confusion for the bewildered patient.

The essence of good medical practice in respect to musculoskeletal function must embody the following:

1. On initial consultation, be open minded and give the patient the benefit of any doubt. The malingerer is not hard to identify, but the clinician should be mindful of abnormal illness behavior that is not a conscious effort to defraud.
2. Take a detailed history of how the dysfunction occurred, with particular reference to the presence of initial trauma, effects of cumulative minor trauma, precipitating and relieving factors, and clinical hallmarks of inflammation as opposed to pain of mechanical origin, i.e. morning pain and stiffness versus gradual onset of pain with a particular activity.
3. The musculoskeletal history must be married to careful examination of the structures involved. This can only be achieved when the clinician has a thorough knowledge of the anatomy and biomechanics of these structures.

4. The clinical examination must be undertaken with the patient stripped to underclothes only. The purpose of the clinical examination is to reproduce the patient's pain, preferably by more than one means, i.e. palpation, compression, resisted movement, etc. It is essential to always ask the patient 'Is that your pain?' In other words, is the pain being reproduced in the process of the examination the pain for which the patient has sought medical help?

5. Formulation of a diagnosis is on the basis of the history, a knowledge of anatomy and biomechanics and pain reproduction. Blocking the area of pain with small volumes of local anesthetic may help to establish the diagnosis. This may need to be done under image intensification.

6. Formulation of a management plan must follow. Whether the treatment is rest, mobilizing, manipulation, injections, acupuncture, etc., there must be a noticeable response by the patient. Failure to make progress after five or six treatment sessions necessitates a review of the whole case. There is no place in good medical practice for 'endless' treatment with no observable improvement in function.

Careful adherence to the principles above has revealed a consistent set of symptoms and signs in a small number of patients who had been thought to have low back pain but whose pain arose from damage to specific pelvic structures. These findings have led the author to consider that these patients have an unstable pelvis.

DIAGNOSING PELVIC 'INSTABILITY'

Over a period of 5–6 years, the author accumulated 88 patients whose major complaint was that of deep-seated 'low back pain' that proved to be non-visceral pelvic pain. The major characteristic of these patients was their inability to sit evenly on each buttock, along with significant diminution of their activities of daily living. Table 43.1 shows the patient profile, while the common characteristics of patients suffering pelvic instability as defined in this study are listed below. There is no importance in the order. The eight most common symptoms are:

- history of trauma
- very low back pain
- favours one buttock
- straight leg raise 70° – no pain
- constant diffuse pelvic discomfort
- cannot fully weight-bear on affected side
- no referred pain beyond the pelvis
- pain down inclines and stairs.

Table 43.1 Study population

	n	Average age	Duration from injury to diagnosis
Female	64	40	2 years 4 months
Male	24	39	2 years 8 months

As part of the clinical assessment all patients presenting with lumbar/pelvic musculoskeletal pain are assessed for thoracolumbar functional syndrome as well as the upslips and rotational derangement of the pelvis. None of the 88 patients could be considered to have any of these recognized pathologies.

All these patients had a history of trauma that preceded the onset of their symptoms. Only two patients described the onset following difficult childbirth, all others describing a severe twisting and compression type of accident as one might envisage when a nurse is left to hold a collapsing patient (Table 43.2). The trunk is twisted suddenly in one direction with legs and pelvis pointed in another, causing excessive torque on the pelvis. Motor vehicle accidents are another cause whereby the pelvis can undergo damaging torsion.

From the presenting symptoms common to these patients, as described above, it can be seen that these symptoms could readily fit most causes of lumbar pathology, and it is with this in mind that all these patients had been investigated with either computerized tomography (CT) or magnetic resonance imaging (MRI) of the lumbar spine. The results of these radiological investigations were normal. Not one of these patients had their pain reproduced during the clinical examination, and because no cause to their pain could be found, they were considered to be less than genuine. The fact that all patients except two

Table 43.2 Cause of the impairment

	n
Pregnancy	5
Nursing injury	16
Motor vehicle accident	11
Forceful twist	56

were workers or accident compensation cases added further suffering and indignation when fellow workers learnt that a medical basis for their pain had not been established.

It is unfortunate that much of medical thinking for people with low back pain, whether it is low or very low, invariably concentrates on being related to a dysfunctional disc or zygapophyseal joint. The literature describes many lumbar and pelvic structures as being the source of low back pain even with referred pain patterns (Broudeur et al 1982, Fortin et al 1994, Schwarzer et al 1995). The iliolumbar, sacrospinous, and sacrotuberous ligaments, hypertonic multifidus and erector spinae muscles, as well as the sacroiliac joints (SIJs) can be responsible for low back and pelvic pain.

By employing the above principles of musculoskeletal clinical examination, it was found that there was a small group of patients who had deep seated low back pain who had as their major source of pain, sacroiliac (SI) dysfunction coupled with ipsilateral sacrospinous ligament pain. Although these symptoms fit many aspects of low back pain, the cardinal features to alert the clinician as to the possibility of pelvic instability are:

- inability to weight-bear fully or hop with ease on one leg
- habitually favoring one buttock in a sitting position
- exacerbation of pain when going downstairs or inclines.

Stressing the SIJ must be part of the standard assessment of all patients presenting with low back pain. If the provocation tests for the SIJ are positive by reproduction of patient's pain and the patient has had a history of the three symptoms above, he or she becomes a candidate for rectal examination to stress the sacrospinous ligament on the ipsilateral side, comparing it with the one on the contralateral side. All patients with pain reproduction on stressing the SIJ and sacrospinous ligaments in this study displayed an asymptomatic tenderness of the symphysis pubis. Despite this tenderness being unrecognized by the patient, it is important when considering the biomechanics of the problem. These patients were also tender over the sulcus between the posterior superior iliac spine (PSIS) and sacral tuberosities.

A 'GOLD STANDARD' FOR SIJ DYSFUNCTION

To date, there is no gold standard to measure dysfunction of the SIJ. Intertester reliability has been judged as poor when measuring relative movement of the PSISs (Cibulka et al 1988, McCombie et al 1989, Potter & Rothstein 1985). Thus pain provocation was considered the best way to establish the existence of SIJ dysfunction. However, a variety of such tests exists (Laslett & Williams 1994, Walker 1992), so it was decided to assess two tests for the purpose of determining SIJ dysfunction by pain provocation.

A double blind study using a single assessor with 20 patients in the test group and 20 in the placebo group was conducted. In this study, the usual test for lumbar dysfunction (extension, flexion, side-bending, and foraminal compression) did not reproduce pain where the patient normally experienced it. In addition, the functioning of the straight leg raise, femoral nerve stretch testing, hips and knees, were all within normal limits. The two tests chosen for the study were:

1. FABER – **F**lexion, **Ab**duction and **E**xternal **R**otation. This test is also known as Patrick's or the Figure 4 test. The advantage of this test is that it is well known and uses the femur as a lever to move the ilium anteriorly relative to the sacrum while the pelvis is stabilized. However, in this position other structures are also moved or stressed, i.e. iliolumbar ligaments, L5–S1 facet joints, and the soft tissues in the groin. Had these structures been painful, they would have been identified during the clinical examination.
2. FADE or POSH – **F**lexion, **Ad**duction, **E**xtension or **Po**sterior **Sh**ear. This test consists of flexing the hip, adducting the femur to the midline and exerting axial pressure along the femur, thus pushing the ilium posteriorly relative to the sacrum. It must again be noted that other soft tissues are being stressed, especially the sacrospinous and sacrotuberous ligaments, where pain provocation assists to identify pelvic instability.

Patients whose SI pain was reproduced by these two methods were selected on a randomized basis to receive 4 ml normal saline or 4 ml 1% lidocaine by injection under image intensification. The pain response to the above two tests was measured on a visual analog scale (VAS) of 1 to

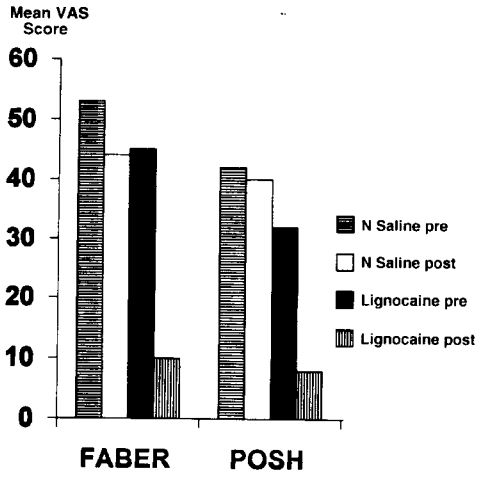

Fig. 43.1 Response of pain provocation for sacroiliac joint dysfunction using the FABER and POSH tests when the joint is injected with either 4ml normal saline or 4ml 1% lignocaine.

100 preinjection and again 15–30 min post injection. Results are shown in Fig. 43.1.

Using the criterion that a successful injection diminished the patient's pain by 75%, the sensitivity was 1.0 and the specificity 0.80 for the FADE test, and 1.0 and 0.77 respectively for the FABER test. The 2 × 2 analysis of variance for each test gave a level of significance of 0.005. It was concluded that these two tests were more than adequate for diagnosing pain arising from the SIJ.

At present, eliciting SI pain by these two tests and blocking such pain with intra-articular injections of 1% local anesthetic is considered a reliable means for establishing SIJ dysfunction. It is now confirmed that there is a small group of deep, very low back pain sufferers who can be said to be suffering from pelvic instability based on this triad of pain provocation in each of the:

- SIJ
- sacrospinous ligament
- symphysis pubis (Broadhurst 1994).

MANAGEMENT

At the time of diagnosis of pelvic instability, all patients were fitted initially with a tightly applied pelvic belt worn just above the greater trochanters. The FABER and FADE tests were repeated and the patients asked whether their pain on provocation had altered or whether they felt a noticeable decrease in their pain. When asked to walk 10 m briskly up and down the passageway with the belt tightly applied, there was a consistent 25–40% reduction in pain measured on VAS change. Many patients remarked that they no longer felt as though their pelvis was falling apart.

A pelvic belt was prescribed for each patient and the belt was to be worn all the time except for toileting and showering. Pelvic floor exercises were also prescribed, whereby the levator ani musculature was contracted for 20 s and released for 20 s. This was repeated for 5 min at least twice a day.

At the 6-week follow-up patients were asked whether the belt had improved their quality of life, made no difference, or had been detrimental. Seventy-six per cent of patients maintained that life had been much more bearable when wearing the belt as directed, whereas 19% said it had not helped. The rest complained that the pain was worse after a day or two of wearing the belt, which was then discarded. It is noted that those patients not happy with the long-term use of the belt had a body mass index (BMI) outside the 20–25 range.

For those patients who were too thin, the belt caused skin and periosteal irritation even though there was padding on the belt, which was then worn over the outside clothing. Unfortunately, the overweight patients had difficulty getting enough lasting pelvic compression because of their adipose tissue, which resulted in the belt slipping upward.

Other treatment options were presented to the patients at the 6-week follow-up, when the triad of tests was again administered and found to be positive. However, in several patients the pain was reduced. Treatment options included dry needling of the trigger points in the buttock muscles, cortisone injection to the SIJ under image intensification, and postisometric exercises for the tender pelvic muscles, i.e. iliopsoas and piriformis. The use of 15% dextrose as a sclerosing agent is not an accepted treatment modality in Australia and was offered to patients after everything else had failed. Only seven patients accepted this option.

Table 43.3 gives a synopsis of the response of the various treatments on the basis of improve, no help or worse. In particular, the responses are as follows:

1. Pelvic belt – still being worn by 63% of patients on a regular basis at the 6-month check,

Table 43.3 Response to treatment after 6 weeks

	Better	No help	Worse
Physiotherapy	18	5	57
Chiropractic	5	0	58
Exercises	33	27	7
Pelvic belt	71	6	11
Injection			
Steroid	32	8	5
5% Dextrose	6	1	0
Hydrotherapy	17	18	0

especially when required to do more than just sitting at home. The rest of the patients had abandoned its use either because it was uncomfortable or because there was lack of progress. Further follow-up was not pursued but at other visits most patients indicated that they resorted to the use of the belt when the pelvis was stressed or their pain for some reason had increased.

2. Pelvic floor exercises – compliance was very poor. After 2–3 weeks, fewer than half of these patients were doing this exercise, and one assumes that they were discontinued by natural attrition. Although the use of these exercises seemed reasonable on the bases of anatomy and biomechanics, the patients obviously do not find them efficacious enough to persevere.

3. Postisometric exercises – these were directed at the two tender muscles often involved in low back pain, i.e. iliopsoas and piriformis (Fishman & Zybert 1992, Lewit 1991). These exercises were done as five repetitions twice a day with the SIJ belt applied. Approximately 37% of patients attributed relief of their pain due to these exercises.

4. Cortisone injections – one vial of a depo-steroid and 2 ml 1% lidocaine – were injected into a painful SIJ under image intensification on 45 occasions, 32 patients saying the injection helped in the overall reduction of their symptoms.

5. Sclerosing using 15% dextrose – this medium has no recognized standing in Australia and has been declared an invalid treatment by compensation and insurance companies. Thus patients were treated using this method only as a 'last ditch stand'. A volume of 10 ml 15% dextrose was applied over the dorsal SI ligaments on four occasions a fortnight apart. Six weeks following the last injection, the patients were assessed for level of pain. Only 7 patients were treated in this way, 1 saying there was no improvement and 6 indicating significant improvement.

RESULTS

It becomes obvious that the entity of pelvic instability involves multiple structures for which neither a single treatment modality nor a combination of treatments are likely to provide effective resolution of the patient's symptoms.

At the end of 3 months, the patients were asked to estimate the success of treatments by indicating the percentage improvement using the VAS. The response of the 88 patients is seen in Fig. 43.2, which indicates that a considerable number of patients continued to experience long-term impairment and worked daily with pain.

The lack of large numbers in this study prevents a reliable statistical analysis being made of the return-to-work status for those who have been diagnosed as having pelvic instability on the basis of the triad of painful symptoms.

Unfortunately the work status as the time of the initial consultation was not recorded and was not included in the questionnaire; however, Tables 43.4 and 43.5 are an attempt to categorize the return-to-work status by sex and the level of ongoing discomfort. Nearly 40% of sufferers were unable to work because of the pain suffered in the type of job they occupied. Forty-eight per cent of sufferers had less than a 50% improvement in their pain and this group is noticeable by the fact that 20 females were working, compared with only 4 males. When considering those patients who had 50% or greater improvement, the proportion of males working is increased.

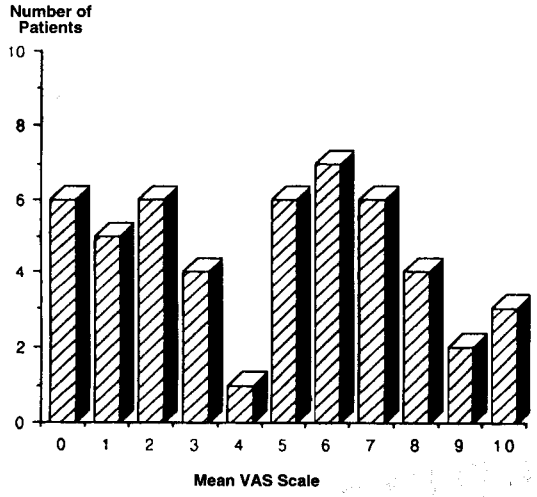

Fig. 43.2 Improvement of the pain score as measured by a VAS 0–10 after 3 months of treatment, which included wearing a SIJ belt and doing pelvic floor exercises.

Table 43.4 Work status after 6 months' treatment

	Female	Male	*n*
Full time	27	5	32
Part time	17	7	24
Unable	20	12	32

Table 43.5 Distribution of work status improvement by gender

	VAS improvement	
	0–4	5–10
Full time	13	15
	13F 0M	10F 5M
Part time	11	15
	7F 4M	12F 3M
Unable	18	16
	12F 6M	10F 6M

On the basis of the type of industry in which most males were employed, it is obvious that the physical demands of their job meant that they had to have a greater resolution of their injury before they could be gainfully employed. Another explanation could be that females suffer pain and discomfort more stoically than do males.

The questionnaire did not ask whether the patients were self-employed, public servants, in small businesses, or in large corporations. Further investigation needs to be carried out to see whether the figures agree with the study of Greenough and Fraser (1989), whereby injured workers on compensation took longer to return to work than people not on compensation.

CONCLUSIONS

1. People who are subject to considerable pelvic torsion are likely to suffer subsequently from pelvic instability, which can be defined by a triad of painful symptoms emanating from the SIJ, sacrospinous ligament, and symphysis pubis.
2. At present, the major source of relief from suffering is the wearing of a pelvic belt, which in the long term is for most sufferers worn intermittently to minimize the pain when exacerbations are experienced.
3. The continuing absence from the workforce is a constant cause of distress for the worker and family, as well as being a burden on the compensation system. Although the number of sufferers is small, 40% are relatively young and have no likelihood of being gainfully employed.
4. This condition of pelvic instability needs to be recognized as a possible consequence of pelvic trauma. More effort needs to be put into a program to educate physicians of its existence, and better treatment modalities have to be developed in the near future.

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