Degeneration, malingering and mythology

Dr A David N White, Southport

In forming an opinion the medical expert is aided by symptoms and signs.

Symptoms are the subjective experiences of the patient or victim and are fairly standard in most injury situations. The commonest of these of course, is pain.

Emotive and extravagant descriptions of pain do not mean that the victim is a malingerer. They do however raise the suspicion that the psychological aspects have greater moment than the impairment of physical function.

When there is an apparent discrepancy between the symptoms and the extent of injury, the most the medical expert can say is something along the lines of "the symptoms appear disproportionate to the apparent pathology" or he may draw attention to specific "functional" aspects.

An example of this occurs fairly frequently in assessment of spinal injuries. It is routine for the orthopaedic surgeon to test the victim's sensory appreciation in the limbs. On occasions sensory deficit has a global distribution, for example, the whole arm or leg may be numb. The examiner knows that this pattern does not conform to the anatomical distribution of the nervous system. This is a "functional" impairment and the report will usually state "appreciation of light touch was reduced in a non-dermatomal distribution" or refer to a "glove and stocking" loss of sensation. (A dermatome is the term used to describe an area of skin supplied by an individual spinal nerve.)

Signs, on the other hand, are objective clinical manifestations which can be detected by examination. They are not under voluntary control. Examples pertinent to personal injuries are swelling, muscle wasting, alteration of the reflexes (for example, the knee or ankle jerks), muscle spasm or rigidity, loss of normal spinal curvature, crepitations on passively moving joints such as the knee and any visible inflammation, bruise or alteration of skin appearance. (A crepitation is a grinding sensation which can be felt by the examiner's hand during passive movement of a joint and usually indicates some internal disruption.)

The absence of signs does not indicate absence of pathology. When present however, signs are strong confirmation of a patient's complaints.

Where there are no objective signs the prognosis can frequently be accurately assessed in the light of the known natural history of the injury. The classic example of this is the flexion/extension injury of the cervical spine or "whiplash" consequent to rear-end collisions.

The symptoms associated with this injury are fairly standard. Commonly however there is a paucity of signs. In many cases the only objective evidence of injury is a subtle loss of the normal curvature of the cervical spine apparent on x-rays. This may even be reported as "within normal limits" by the radiologist.

Injuries of the spine are among the commonest requiring the attention of lawyers and doctors. There are of course many possible mechanisms of injury from diving into a shallow pool to being thrown off an animal. It is usually those consequent to work or traffic accidents however that enter the medico-legal arena.

Traffic accidents resulting in death, quadriplegia or other horrendous disability are relatively simple in the medico-legal sense. More contentious however are those cases where there is a partial impairment, the possibility of improvement exists through either conservative or surgical means or where there is the presence of pre-existing pathology - usually described as "degenerative change".

Some simple anatomical concepts may be helpful when you are obliged to wade through a report on an injured spine.

The spine from the base of the skull to the tail-bone consists of a number of bones, the vertebrae, which can be thought of a small blocks forming a vertical column. Between each block, or vertebra, is a pad of tissue called the intervertebral disc - more usually referred to as simply a "disc". This is further described by a letter and the number indicating where it lies in the spine. For example the C5/6 disc is the intervertebral disc between the fifth and sixth cervical vertebrae. The thoracic spine is prefixed with a T and the lumbar spine with an L. The lowest lumbar disc is usually described as L5/S1 or the lumbosacral disc - that is the disc between the lumbar spine and the sacrum.

The discs can be thought of as soft squash-ball like structures lying between and flattened by the vertebrae. Their centre is gel-like. The outside rim of the disc is made of tough fibrous material and is usually referred to as the annulus. The disc acts rather like a soft ball-bearing allowing movement of the vertebrae so that we can bend forward and twist to either side.

Immediately behind all the vertebrae and the discs is a long sausage-like bag which emerges from the base of the brain and ends usually about the top level of the lumbar spine. This bag, called the dura (or theca), contains the spinal cord from which nerves emerge at each level corresponding to a vertebra. The spinal cord and descending nerves are covered by an arch of bone attached to each vertebral body. The whole structure resembles a segmentally hinged pipe lying lengthways on a solid bar. It has joints at each level with the vertebrae above and below called facet, or sometimes, zygapophyseal joints. The emerging nerve at each level comes out of the spinal canal in front of these joints and is in contact with the back of the disc as it does so.

The whole structure is further complicated by multiple ligaments, muscles and joint capsules.

The investigation of back pain

As in all medical conditions an adequate history is taken and a physical examination performed.

It is not possible to assess the spine adequately unless the patient is stripped to their underwear and both shoes and socks removed. This point cannot be stressed too strongly. ▶

The gait and standing posture of the patient is observed. Noted are any abnormal spinal curvatures, the leg lengths, presence or absence of muscle rigidity or "spasm", presence or absence of tenderness and the range of voluntary spinal movement is compared to the normal. The limbs are assessed for wasting, power, sensory appreciation and the reflexes. Straight leg raising in the supine position is then performed.

The importance of the latter test is its relationship to a disc protrusion causing nerve root irritation. Although restriction of the "SLR" is not in itself proof of any specific pathology (being under voluntary control), its presence may help confirm the need for further investigations.

Possible investigations are:-

1. Plain X-rays. This is the basic yardstick and should be the initial investigation. Plain radiographs provide information on bony structure, fractures, malignancies, spinal curvature, disc space heights and degenerative change (such as osteophytic lipping or spurring - often referred to as spondylosis in the case of the vertebral column. This term is equivalent to osteoarthrosis, or osteoarthritis, in other joints.)

2/3/4. CT, MRI and Myelography can be considered together in so far as they all seek to demonstrate much the same information and should ONLY be performed (on clinical grounds) if active surgical treatment is considered likely. They provide similar information but differ in sophistication and risk to the patient.

Myelography is an invasive procedure. An injection of a radio-opaque dye into the spinal fluid is required. The distribution and flow of the dye is then monitored under fluoroscopic control and appropriate still radiographs taken. The procedure may be associated with CT scans. These basically take x-rays at varying depths and a 3D reconstruction can be obtained.

MRI has largely replaced myelography and to a lesser extent CT. Unfortunately it is extremely expensive and the scanner may cost upwards of $5,000,000.

The main advantages of MRI are its accuracy and non-invasive application. It is also more suitable than CT to assess tears within the substance of the discs as opposed to a frank protrusion.

MRI has many other important investigative applications within the body, the non-invasive assessment of joints for example, and is widely used in the USA - as it will be here eventually.

5. Discography. This has also been largely replaced by MRI where the latter is available. Discography is invasive and involves an injection of saline (salt water) into the intervertebral disc. This is the "disc stimulation" and if positive the patient will report the reproduction of their usual pain. Radio-opaque dye is then injected into the disc to demonstrate any rupture or extrusion. Some surgeons combine this with a chymopapain enzyme injection in appropriate cases so performing a chemical "discectomy".

6. Nuclear Scans have a significant role in assessing bony lesions particularly neoplasm (cancer) and other growths, fractures and inflammation.

An intravenous injection of a radioactive isotope is given. A couple of hours later a Geiger counter is placed over the parts to be examined and the activity level recorded on x-ray film.

7. Blood Tests have many roles - some assess bone turnover, detect gout, or help detect and monitor bone infection.

8. Electromyography (EMG) or Nerve Conduction Studies have many applications. Apart from confirming the presence of specific nerve disorders, such as a carpal tunnel syndrome, they can indicate at which level a nerve lesion is present from the spinal cord to the fingers or toes.

9. Nerve Root Infiltration Tests or Facet Blocks. An injection of local anaesthetic is given in an attempt to isolate the part causing the particular pain under investigation. This also helps with preoperative planning on occasions.

This list of possible investigations is included chiefly for completeness. Not all are applicable to any individual case. There is in fact a strongly-held view in orthopaedic circles that no investigation should be performed unless some subsequent active treatment appears likely.

This view however is less acceptable in medico-legal situations!

Pathology of disc injury

With age the water content in the disc tends to dry out and the disc loses elasticity. This is variously described in MRI scan reports as degrees of desiccation, dehydration or even degeneration. Its presence presumably makes the disc more vulnerable to trauma.

An acute back injury can result in bony damage or fracture, musculo-ligamentous strains, or disc injury. It is however important to realise that the actual pathology incurred in an injury may well not be detectable by current investigative means. For example, we have no objective means of assessing soft tissue injuries such as musculo-ligamentous strains or what additional damage has occurred in an injury causing aggravation of some pre-existing pathology.

The effect of a back injury for which objective investigations are unavailable then largely becomes a matter of history (symptoms) and depends on the veracity of the sufferer.

The picture becomes a little clearer where there is a disc lesion demonstrated by CT or MRI scan. Once again however one needs to bear in mind that there is an incidence of false-positive and false-negative results applicable to any investigation. The radiology report may also reflect the author's opinion - there are few absolute facts!

Disc lesions occur as a consequence of trauma. Sometimes a single incident can be reliably implicated such as a violent motor vehicle accident. Sometimes there may be a succession of relatively minor injuries such as repetitive heavy lifting or activities undertaken in awkward positions.

In the latter it is generally considered that the annulus and immediately subjacent tissue is initially damaged. Weakening ensues leading to bulging of the disc. With further damage, perhaps following only micro-trauma such as may be experienced in a cough or simply bending, the annular wall is weakened further and the inner contents of the disc bulge out in a localised fashion. This is then called a herniation, protrusion or prolapse.

In the most severe disc lesion it extrudes so much that some may separate from the main body and be referred to as an extruded disc or sequestrum. The fragment may then lodge under an emerging spinal nerve root causing severe pain.

Any posterior bulging of a disc may come into contact with the spinal nerve crossing it and produce an inflammatory response within the nerve coverings. This may then be called a "nerve root effect" or "nerve root irritation". The consequence

of this may be sciatica (sharp, posterior lower limb pain) and/or paraesthesia ("pins and needles" or numbness) in the distribution of the affected nerve. When this is sufficiently severe and unremitting, surgical decompression (laminectomy, discectomy) may be required for its relief.

The question often arises as to when one can accept disc bulging as normal.

Unfortunately there is no clear answer in the absence of nerve root effect. Many studies have shown that asymptomatic adults in their fourth decade of life frequently have bulging discs.

On the other hand, bulging discs associated with a history of injury in those under the age of 30 are more likely than not to be a consequence of the described trauma.

Degenerative change

The presence of degenerative change or pre-existing pathology is very commonly a factor of some significance in the medico-legal assessment of injuries.

It is also an area heavily laden with mythology!

Degeneration is a part of the normal ageing process like greying of the hair and wrinkling of the skin.

Disc degeneration is part of this ageing process and in the normal course of events may well remain asymptomatic. It has in fact been widely acknowledged in the orthopaedic literature that there is no significant correlation between the radiological appearance of degenerative change, pain or employment. The most widely read and respected book on the subject, *Macnab's Backache*, 3rd Edition, 1997, p.217 when reporting on a survey of three hundred 40 year-old heavy labourers, states: "Indeed, some of the patients who had been employed in strenuous occupations all their lives without a twinge of back pain showed very marked degenerative changes on radiography."

He also showed that although degenerative change increased in a linear fashion throughout life, the incidence of backache peaked at 45 and tended to decline thereafter.

In other words - in spite of radiological evidence of worsening degeneration backache decreased in the latter half of life.

The term "degenerative disc disease" is inappropriate and, in my opinion, should not be used. It implies a progressive illness rather than the natural and inevitable consequence of ageing.

Disc degeneration, however, may render the spine more vulnerable to trauma and as a result of this pain may arise from annular tears, ligament damage or from facet joint disruption, apart from the disc itself.

When this occurs it appears logical to conclude that the injury may well have induced some permanent deleterious change in the underlying pathology.

Assessment of the long-term prognosis therefore involves an estimation of the contribution made by the previous pathology, the change effected to that pathology by the injury, the body habits, lifestyle and employment of the patient. It is, at best, an educated guess dependent on the experience and attitude of the examiner as indicated in this quotation from an oration by the Governor of NSW, Gordon Samuels, AC, given in the Great Hall of the University of Sydney on June 17, 1997. His Excellency was quoting from *Taylor on Evidence* by expert witnesses.

"...witnesses are usually required to speak, not to facts, but to opinions; and when this is the case, it is often quite surprising to see with what facility, and to what extent, their views can be made to correspond with the wishes or the interests of the parties who call them." ■

A David N White is an Orthopaedic Surgeon in private practice, **phone** (07) 5531 2255, **fax** (07) 5591 7941

Court gives patients more leverage in negligence cases

Fiona Buffini

Patients may become more litigious following a High Court finding that a doctor was negligent in failing to warn of a surgical risk — even though the patient would have eventually gone ahead with the operation, according to a lawyer involved in the case.

Before the decision in *Chappel v Hart*, patients had to argue that they would have forgone the operation had they been fully aware of the risks, said Mr David Hirsch of Sydney firm Cashman and Partners, who was junior counsel to the patient, Mrs Beryl Jean Hart.

"This is an extremely significant decision. This case may make it easier for patients to succeed in negligence claims against doctors for failure to warn of risks."

But the Medical Defence Union said the decision, handed down earlier this month, did not impose additional duties on doctors.

Tress Cocks and Maddox partner Mr Stephen Barnes, who was Dr Clive Chappel's solicitor, said: "The law remains as stated by the High Court in *Rogers v Whittaker*, namely that a practitioner is under a legal obligation to warn patients of material risks."

Mrs Hart suffered a throat condition and underwent elective surgery by Dr Chappel without being warned of the possible consequences should her oesophagus be perforated. This happened, causing nerve damage and voice loss.

While Mrs Hart would have inevitably needed the surgery, she argued that had she been aware of the risk, she would not have had the surgery when she did, and would have had it performed by a more experienced surgeon.

Dr Chappel argued that there was no connection between the failure to warn and the damage suffered, as the surgery was inevitable and the risks inherent. The court held by a three-to-two majority that Mrs Hart would not have had the operation on the day, and on any given day she would not have been injured, so Dr Chappel's failure to warn resulted in her injury.

Mr Hirsch said: "It now appears that if the patient were to say, 'if I had been warned I would have deferred the operation or thought about it, or got a better doctor', they may be able to succeed in a legal claim for negligence — unless the defence can show the injury would have happened even if the operation was deferred."

The MDU said the decision did not mean doctors had a legal duty to advise patients of the availability of more experienced surgeons: "As a number of judges were at pains to point out, the law only imposes upon a medical practitioner a duty of reasonable care, not a duty to ensure that the absolute optimal care is rendered to a patient by the best available surgeon."

Justice Michael Kirby said in judgement that in Australia, the requirement to warn patients about the risks of medical procedures "is a rigorous legal obligation. Breaches must be treated seriously".

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