REFRESHER COURSE FOR GENERAL PRACTITIONERS

THE TREATMENT OF LUMBAR DISK LESIONS

BY

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Much confusion exists on this subject. Some years ago the main difficulty was to appear credible when attributing such well-known conditions as lumbago, fibrositis, and sciatica to so recent a discovery as a disk lesion. Now that the diagnosis has become widely accepted, medical men have found themselves in a therapeutic quandary. Traditional measures such as drugs (apart from analgesics), radiant heat, diathermy, massage, exercises, injecting nodules, and "taking the waters" have suddenly lost their last vestige of theoretical justification. Little has so far come forward to replace these abandoned types of "treatment"; and the distress of doctors and patients at the apparent absence of effective conservative measures is heightened when they find out that the only radical treatment is an operation—by no means always successful—warranted only in extreme cases.

This therapeutic nihilism is quite unjustified, for there are a number of simple treatments, none a panacea, each with its due proportion of successes. Few patients prove unrelievable if conservative means are intelligently employed, and it is only for some of these few that surgery need be contemplated at all.

Prophylaxis

Realization that disk protrusion is very common and that maintenance of the lumbar lordosis provides the main safeguard against this phenomenon is proceeding slowly. Aesthetic considerations have held the foreground for a century, and it is difficult now to get gymnasts to realize that a reasonable degree of lordosis in children is a great advantage in later life (see Fig. 1). School medical officers can see to it that exercises towards trunk flexion (see Fig. 2) are carried out sparingly, and that, unless marked kypho-

lordosis is present, no effort is made to flatten school-children's lumbar spines. If any individual cannot reach forwards far enough to touch his toes he must not be encouraged to practise this useless range of movement. Adult women's back-ache often dates from lying in bed in "the nursing mother's position"—that is, many pillows propping the thorax and no proper support at the lumbar spine, which droops into kyphosis all day. No wonder the posterior longitudinal ligament finally

stretches and the beginnings of disk protrusion are laid down. All patients, including puerperal women, should lie flat when they have no reason to be sitting up, and as soon as their condition permits they should turn and lie prone for several periods each day.

Industrial medical officers can help by arranging that weights are presented to workers at a proper level and by showing them how to lift safely. Since an attack of disk protrusion is clearly an industrial accident, they can also save their firms much money in this way. Builders can put in sinks at a higher level than has hitherto been customary, and so on. The makers of car seats are among the worst

offenders; these are so shaped that it is all but impossible to maintain a lordosis while sitting in a front seat.

FIG. 2.—Joint space in flexion. The same subject as in Fig. 1, bending forwards. The joint space is now $\frac{5}{16}$ in. (0.8 cm.) wide in front, and $\frac{1}{4}$ in. (0.6 cm.) behind.

Manipulation

Naturally if something is out of place the most obvious treatment is to restore it to its proper position and then maintain it there. Therefore, unless some good reason exists, manipulative reduction should be attempted at once. This measure is universally adopted when a torn meniscus in the knee-joint has moved, but it has been left largely to osteopaths to reduce cartilaginous subluxations at the spinal joints. Without realizing it, they have been doing so for years, to the recurrent discomfiture of doctors. When one considers how unskilled many lay manipulators are and how faulty are their views on the nature of the disorder under treatment; when, too, one remembers for how many years patients with severe disk lesions have been manipulated—often without benefit, it is true, but also without hurt—even under anaesthesia by medical men, it is evident that the present change of front towards emphasizing the dangers of manipulating the lumbar spine represents too great a swing of the pendulum.

The first decision that has to be made is whether the displacement is reducible or irreducible by manipulation. The reason for the two different responses to manipulation is anatomical. Protrusions may consist primarily of a fragment of annulus fibrosus or of nuclear material with an intact annulus. R. H. Young, in an analysis of cases coming to laminectomy, showed that in 56% of his cases the protrusion was cartilaginous, and in 44% pulpy. My impression is that in patients not requiring operation the

FIG. 1.—Joint space in extension. Tracing of x-ray photograph of the fourth lumbar intervertebral joint in a normal subject, bending backwards. Note that the front of the joint space is $\frac{1}{4}$ in. (1.25 cm.) wide, but the back only $\frac{3}{16}$ in. (0.5 cm.). In this position backward movement of the intervertebral disk is virtually impossible.

proportion is more like two cartilaginous protrusions to one pulpy. Manipulation can, of course, reduce a cartilaginous displacement but cannot affect a pulpy protrusion; this, by contrast, can nearly always be made to ooze back into position by gradual means. Thus the first major decision—whether or not manipulation should be attempted—rests on an evaluation of the symptoms and signs differentiating a nuclear from an annular protrusion. These are set out below.

Differentiation of Cartilaginous from Pulpy Protrusions

The history is often indicative. For example, a patient bends forwards and feels some aching in his back, which gets worse later in the day. Next morning he finds himself unable to get out of bed because of severe lumbago. This history indicates a protrusion that has gradually

FIG. 3.—Pulpy protrusion causing lumbago. The nucleus has protruded backwards, the annulus remaining intact (after R. H. Young). Manipulation is unlikely to succeed; sustained traction or recumbency is effective.

FIG. 4.—Pulpy protrusion causing sciatica. The protrusion has increased in size and has passed postero-laterally. As a result the pressure on the dura mater is released but the nerve root is severely squeezed (after R. H. Young).

FIG. 5.—Cartilaginous protrusion causing lumbago. The annulus is cracked and hinged. Reduction by manipulation should be simple.

increased in size—that is, one consisting of nuclear material (see Figs. 3 and 4). By contrast, the patient who is subject to attacks initiated by a click in the back followed by agonizing lumbar pain fixing him in flexion has clearly suffered an abrupt cartilaginous displacement (see Fig. 5). Pulpy protrusions are rare in the elderly; hence any protrusion in a patient aged 60 and over, especially if lumbar osteo-arthritis is present, is almost certainly reducible by manipulation, whether causing lumbar, gluteal, or sciatic symptoms.

Primary postero-lateral protrusions causing sciatica are nearly always irreducible by manipulation. This is indicated when a patient with a low lumbar disk lesion states that his pain began in the calf or thigh without previous backache. Naturally a central displacement impinges first against the dura mater, thus causing backache before it sets up sciatica; primary postero-lateral protrusions never touch the dura at all, hence premonitory backache is absent.

Another type of history characterizes the self-reducing disk lesion; in such a case manipulative reduction may well succeed there and then, but brings only a few hours' relief. The patient wakes comfortable, and as the day goes on backache appears and becomes slowly more severe, especially if he stoops or lifts. A night's rest once more abolishes the pain. Naturally, if the posterior bulge at the joint recedes spontaneously as soon as the stress on the joint ends, only to recur when the joint is made to bear weight again, the reduction brought about by manipulation is equally unstable and ephemeral. Manipulation carried out at a time when no displacement is present is, of course, quite pointless.

A similar history characterizes what I have named the "mushroom phenomenon." In an elderly patient, backache accompanied by bilateral sciatica comes on after about 10 minutes' walking or standing and is abolished as soon as he rests. It is often mistaken for intermittent claudication. X-ray examination shows that the joint space

FIG. 6.—Anterior disk protrusion. All the disk substance has passed forwards and lies enclosed between two large osteophytes. The intervertebral space has disappeared.

at, usually, the fifth lumbar level has disappeared, the disk substance being displaced forwards and lying as a round ball between two large osteophytes (see Fig. 6). Anterior protrusion proceeds silently, causing no symptoms until the disk has been ground to pieces and the compression of weight-bearing causes capsular bulging all the way round the joint. The posterior component then irritates both the dura mater and the nerve roots. This lesion is difficult to treat and seldom responds to manipulation.

Referred rectal, penile, or coccygeal pain, paraesthesiae felt in the scrotum, or a complaint of difficulty in micturition may indicate a protrusion imperilling the lower sacral roots. Since the important danger of manipulation in an unsuitable case is lasting urinary incontinence, I regard this type of referred pain as contraindicating manipulation. Not having attempted it in such a case, I naturally cannot be sure to what extent this apparent danger is real.

Of the physical signs, the appearance of the patient's back is the most informative. Lateral deformity of the lumbar spine when he is viewed standing still, or apparent when he bends forwards, indicates a protrusion that has gradually increased in size until it visibly interferes with joint movement. A cartilaginous displacement does not get larger; a pulpy protrusion can; hence considerable lateral deviation indicates irreducibility. I have also found that reduction by manipulation is difficult, at times impossible, in patients whose most painful movement is side flexion *towards* the painful side.

Marked neurological signs should be taken as an indication of irreducibility, whether the lesion was originally of cartilage or pulp. Displacement of a fragment of annulus may later be followed by extrusion of nuclear material along the line of the fracture. This leads to severe compression of the nerve root and proportionate interference with conduction. Thus, weakness of more than one muscle in the leg, combined with, say, loss of ankle-jerk, cutaneous analgesia, or much gluteal wasting, shows that this secondary effect has supervened.

A disk lesion at the unstable joint resulting from spondylolisthesis is treated in the same way as an ordinary disk lesion.

Technique of Manipulation

Manipulation, then, is carried out unless a contraindication exists. Anaesthesia must be avoided; for the patient stands up after each repetition so that he can judge the effect on his pain and the manipulator can assess any change in the range of movement. The patient lies prone on a firm couch 15 inches (38 cm.) high and various manual pressures are applied at the appropriate lumbar level. If these fail, rotation strains should be tried. If manipulative reduction is attempted in this careful way aggravation can be certainly avoided. However, this treatment may require two or three repetitions and an adequate session may last half an hour, hence it is my practice to delegate almost all this work to physiotherapists trained—as all our students are—in these methods. Few doctors have time, inclination, or a suitable couch for carrying out such manoeuvres themselves; moreover, these have in practice been found suited to delegation.

Other Treatments

When manipulative reduction is contraindicated or fails, less satisfactory methods have to be tried.

Sustained Traction

Sustained traction is the method of choice for ambulant patients with pulpy herniations whose symptoms warrant treatment. Distraction at the affected joint has two effects.

(1) Increase in the interval between the vertebral bodies, thus enlarging the space into which the protrusion must recede. (2) Tautening of the joint capsule. Naturally, when the slack is taken up, the ligaments joining the vertebral bodies exert centripetal force all round the joint; this tends to squeeze the pulp back into place. Thus, sustained traction merely represents a way of achieving in a very short time the same effect as rest in bed for some weeks.

Bands encircle the patient's mid-thorax and pelvis as he lies on the traction couch (see Fig. 7); they are attached to

FIG. 7.—Traction couch.

hooks at the head and foot of the couch. The greatest possible traction that he will permit is then applied for as long as is reasonable. In practice, 200–300 lb. (91–136 kg.) is applied for two or three periods of 20 minutes each with, say, five minutes' rest between whiles. The longer the patient can stand the traction, the more effective it becomes. This treatment is carried out daily until he is well; and this takes one to two weeks.

Sustained traction is useless for the reduction of cartilaginous displacements; these have to be clicked back. Manipulation during traction, however, is sometimes called for in difficult cases, but is not often much of an improvement on manipulation alone.

Recurrence after laminectomy is distressingly common and in my experience hardly ever relievable by manipulation. By contrast, sustained traction may be successful.

Epidural Local Analgesia

The injection for epidural analgesia is regarded as difficult and dangerous by some authorities. So far I have used this method on out-patients more than 10,000 times without ill effect and have found it impossible to introduce the needle properly in less than 1% of all cases. There are three main indications:

1. In acute lumbago the cause of the pain is a central posterior protrusion impinging on the dura mater. If this membrane is anaesthetized by 50 ml. of 0.5% procaine, introduced extrathecally via the sacral canal, the protrusion presses on a membrane no longer sensitive and all pain ceases for the duration of the analgesia—that is, one to two hours. During this time a patient can move freely, perform some essential work, or go home to bed. He can be manipulated during local analgesia. Often, as a result of the free active joint movement obtained, he succeeds in himself initiating reduction; hence the infiltration is often followed by a large measure of lasting relief.

2. Persistent lumbar or sciatic aching *after* reduction of a prolapsed disk may prove troublesome; it is apparently due to persistent local bruising of the dura mater. One or two epidural injections usually suffice to stop it.

3. Chronic backache, especially if it is more severe at night than by day, associated with only slight articular signs at the lumbar spine can often be lastingly abolished by one induction of epidural local analgesia.

Recumbency

This is the traditional treatment for both lumbago and sciatica; though tedious and time-consuming, it is regularly effective in the end. It brings about reduction by abolishing the compression factor at the affected joint. The more severe the symptoms—not the signs—the more is recumbency both called for and welcomed. In sciatica the pain may not begin to abate for the first two days and the patient may insist on getting out of bed to walk about the room. Though this may bring slight temporary relief, it postpones the initiation of reduction. Hence the patient should receive enough analgesics, usually morphine, to keep him quietly resting for the first day or two. As soon as he can, he must lie supine with a small pillow under his lumbar area and only one under his head. This maintains his lordosis—that is, keeps the front of the joint as open as possible. In this position the articular contents tend to move anteriorly, away from the dura mater or nerve root. Patients with sciatica should be kept in bed until straight-leg raising is painless at full range. No one should be kept in bed until all the neurological signs recede, for these may take months to disappear; indeed, an absent ankle-jerk may never return.

Patients in severe pain, with marked weakness of the muscles controlling the foot coming on in, say, less than a week from the onset of sciatica, should be put to bed at once. The mild discogenic backache that so many people experience is usually unaffected by recumbency; sometimes it makes it worse.

Spontaneous Cure

Backache shows little tendency to spontaneous cure; it may last, or recur, during a patient's whole lifetime. Sciatica, however, nearly always gets well of itself in about 12 months. The two exceptions are: (a) after laminectomy this does not happen, and sciatica may then persist for years; and (b) after the age of 60 spontaneous cure with the lapse of time is improbable.

Young patients with sciatica are sometimes seen showing clear evidence of a pulpy herniation, at a low lumbar level, of some months' standing. The pain often amounts to only an ache; the patient has a cheerful demeanour and sleeps well. Examination shows a symmetrical lumbar spine when he stands upright, lateral deviation on attempted flexion, 45 degrees limitation of straight-leg raising on one side only, and slight neurological signs. Treatment is not called for, except epidural local analgesia, which sometimes lastingly diminishes the pain, and the patient can safely be advised merely to await spontaneous cure. This takes place by erosion of bone at the posterior aspect of the vertebral body, the displacement becoming accommodated in a situation where it no longer presses on anything sensitive and from which redisplacement is impossible. Hence patients who get well by awaiting erosion appear thereafter no more liable to sciatica than normal people. This is an important point, for the only alternative treatment in these cases is laminectomy, which, however successful it may be, cannot afford the patient comparable security from recurrence.

The tendency to lumbago often ceases spontaneously between the ages of 50 and 60. As age advances, the spinal joints stiffen and osteophytes, both cupping the disk and limiting articular movement, make their welcome appearance.

Laminectomy

This is to be avoided as far as possible, but operation should not be unreasonably withheld. In the best hands

the results are far from perfect; immediate cure is not always secured and eventual recurrence is regrettably frequent, even in patients who never go back to heavy work. The three main indications are:

Gross Lumbar Deformity.—A young patient should not be left to recover spontaneously from sciatica or—less often—backache causing marked persistent lumbar deformity. Though he may recover as regards pain, the deformity remains permanent.

Incipient Drop-foot.—A patient who develops increasingly pronounced weakness of the dorsiflexor muscles of the foot must be warned, so that he may choose between laminectomy and a permanent weak foot. In such cases pressure atrophy may cause complete insensitiveness of the nerve root; as a result, pain is abolished and straight-leg raising quickly reaches full range; at the same time the palsy becomes complete. The patient, concerned as he has been with his pain, is apt mistakenly to believe himself to be improving; unless his foot is examined, the doctor may be led to share in this error.

Intractable Severe Pain.—Care should be taken to make sure that the physical signs present are in proportion to the symptoms. Instances of laminectomy performed for hysteria are, in my experience, on the increase. On the whole, the worse the symptoms and signs are before the operation, the better the result.

Arthrodesis

Arthrodesis is the operation of choice in spondylolisthesis causing sufficient local capsular pain, or setting up traction on the relevant lumbar nerve roots with consequent bilateral sciatica. It is the only effective treatment for anterior protrusion of the whole disk (mushroom phenomenon), and is well worth carrying out in patients under 60. It is also indicated in recurrence after laminectomy if conservative measures fail.

Prevention of Recurrence

Advice to the Patient

The mechanics of lumbar disk protrusion must be explained to the patient, who often imagines that septic foci, choice of food or underclothing, or damp working conditions affect his back. He must be told that so long as his lumbar spine is held in lordosis the joint tilts so that the front is more widely open than the back; in this position movement backwards of the loose part of the disk is virtually impossible (Fig. 1). He must be shown how to stand, sit, bend, and lift, using his knees rather than his back. Neurosis is prevented by explaining that the disorder is purely mechanical, and not the precursor of a crippling disease capable of spreading to other parts of the body. With some exceptions he can go on doing whatever he did before; it is merely the way of doing it that has to be changed.

Patients who find that bending forward hurts often practise this movement vigorously, hoping thus to overcome what to them appears stiffness. This movement defeats its own ends by tending to increase the degree of posterior protrusion. Well-meaning friends often urge exercises on patients with backache; these are all at best harmless. In most hospitals only prone-lying trunk-extension exercises are now prescribed; this is a great advance. They do, however, have two disadvantages over the avoidance of active exercises altogether: (1) When the sacrospinalis muscle contracts it first compresses the spinal joints as far as they will go; it is only when this slack has been taken up that the extension movement begins. (2) The greater the mobility at a joint containing a fragmented meniscus, the greater the liability to internal derangement.

Hence exercising the joint towards *full* extension is less satisfactory than maintaining it as still as possible in *slight* extension.

Support

A Plaster Jacket.—This is a method in great vogue at the moment, but I believe it is seldom worth the discomfort it entails. It is usually employed wrongly—that is, in the hope of securing reduction rather than of maintaining it. It is a mistaken policy to put a patient with an annular protrusion into plaster, for I have reduced such displacements by one manipulation after as long as six months' vain immobilization. By contrast, pulpy herniations do sometimes reduce themselves slowly in plaster, but these are the simple ones that do so much more quickly when treated by sustained traction or recumbency. The results of treating sciatica with and without a plaster jacket do not appear significantly different. It is a palliative measure useful for relieving acute symptoms. Moreover, I have found that patients with gall-stones, peptic ulcer, or merely prone to indigestion usually cannot tolerate plaster; neurasthenic patients with disk lesions demand the removal of the cast within a few days. It is thus only in the exceptional case that plaster is required. One untenable reason for immobilization has been expressed: that rest in plaster allows the broken cartilage to unite. Intra-articular cartilage has no blood supply, therefore it cannot heal at a spinal joint any more than at the knee-joint. The real indication for a plaster jacket is—as for a fracture—the maintenance of reduction in cases of marked instability until a bespoke corset is ready. If a good corset cannot be obtained in a few days, and the patient keeps having recurrences, a plaster jacket may be kept on until the corset is ready.

A Corset.—Whereas a plaster jacket cannot be worn for longer than some months, and thus cannot provide lasting protection against recurrence, corsets, renewed each year or two, can be worn indefinitely, thus affording permanent security. If the two steels are accurately moulded to the lumbar curve, lordosis is maintained and the joints steadied. Moreover, if the patient bends too far forwards or sags as he sits, the front of the corset presses unpleasantly against his lower ribs—a salutary reminder.

Repeated crippling attacks of internal derangement, in spite of adequate precautions once more raise the question of laminectomy.

Figs. 3 and 4, which appeared originally in the author's book *Osteopathy and Manipulation*, are reproduced by kind permission of the publishers, Messrs. Crosby Lockwood and Sons, Ltd.

The total number of administrations of analgesia given by midwives in the domiciliary midwifery service in London during the first six months of the present year was 4,929, or 66% of all the confinements which the midwives attended. This applies to all classes of midwives, those of the L.C.C. and of the District Nursing Association and the hospital district midwives. It is stated that the opportunity of receiving analgesia is given in all cases. The confinements where it is not recorded as having been administered consist mainly of those attended by doctors (concerning which no information is available of the analgesia or anaesthetic administered), women who do not wish to receive analgesia, women who are medically unfit for its administration, and confinements where labour is precipitate. All the 123 L.C.C. midwives, the 30 midwives employed by district nursing associations, and the 84 employed by hospitals on district work are qualified to administer analgesia. The percentage of confinements in which analgesia is administered has risen steadily. For L.C.C. midwives alone, the percentage of confinements in which analgesia was administered was 34 in 1948, and 68 in the first six months of 1950.

MARS AND AESCULAPIUS

A NEW ZEALAND MEMORIAL ORATION

BY

Sir ARTHUR PORRITT, M.Ch., F.R.C.S.

[During his recent visit to New Zealand, his native country, Sir Arthur Porritt delivered an oration at the biennial meeting of the New Zealand Branch of the British Medical Association. The oration was the first to be given in memory of members of the New Zealand Medical Corps who lost their lives in the two world wars. We print below an abridged version of an address which must have given special pleasure to its audience.]

This address must perforce to some extent be personal, but it is my aim to draw from these personal reminiscences deductions which may help to provide such practical and constructive answers to some of our national, professional, and individual problems as one feels would have been endorsed by those whom we are remembering to-day. In the main they were not dramatic heroes, they were not military geniuses, nor were they giants of the medical and scientific world. They were good New Zealanders, good doctors, and our friends, welded together in an inflexible purpose by the furnace of war.

Hence my title—Mars, the god of war, and Aesculapius, the god of medicine. Mars was always represented as a powerful, eager, virile youth (not the helmeted blood-stained brute of modern cartoons), and Aesculapius as an old bearded man, slightly bent, and leaning on a staff around which was entwined a serpent, the emblem of wisdom. The legendary end of Aesculapius is sad and yet prophetic. As a result of a complaint laid by Pluto that mortals were dying too slowly (presumably thanks to the good offices of Aesculapius), and that therefore Hades was being depopulated, Zeus slew him with a thunderbolt. It is comforting to remember, however, that, at the request of Apollo, Zeus subsequently placed Aesculapius amongst the stars for ever and ever, thus symbolizing medicine in perpetuity. . . .

It is from two angles, therefore, that I wish to speak of those of our friends who have gone on—as New Zealanders and as doctors—broadly, though not entirely, in relation to the two cataclysms through which most of us have passed during the last few decades. When one thinks of these last fifty years—Edwardian comfort and complacency, the rude awakening of 1914–18, the spurious artificial prosperity and depression of the inter-war period, the second holocaust, and the years of inevitable reaction, with the stark realities of moral and economic failure lurking just round the corner—is it any wonder that those who have lived five generations in one should feel some measure of instability, should find it difficult to assess their values, should perhaps feel older than their age, and should search consciously or unconsciously for some firm rock of faith to which to cling?

I feel that those we honour to-day had found such a rock. They were New Zealanders. Let us not shut our eyes to the fact that with a short history of little more than one hundred years we have a great tradition. . . . In this young country few of us have got beyond the third generation of New Zealanders, but our grandfathers and fathers were of rugged stock—independent, God-fearing, self-reliant—the real pioneers. Their legacy of virility and stout-hearted adventure has been intensified by the lovely country of our birth. . . . Most of us know far too little of this country of ours—its history, its economic assets, its