

A study of subcutaneous rhizolysis in the treatment of chronic backache

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SUMMARY. Subcutaneous rhizolysis is defined as cutting the nerves to the posterior intervertebral joints. Although a blind procedure, it has proved safe in several centres and provides relief of pain in about two thirds of those who suffer from intractable, persistent backache. Some conditions such as ankylosing spondylitis and previous spinal fusion are clinically unsuitable, but this technique, which is described, is recommended for consideration before all major surgical procedures for back pain are undertaken.

Introduction

Few doctors in general practice can pass a day without being consulted by at least one patient who complains of backache—and almost everyone, doctor and patient alike, suffers a sore back at some time in their lives.

Close on 37 million working days are lost each year due to rheumatic diseases. Backache was responsible for 60 per cent of the lost days in 1971 (Office of Health Economics, 1973).

In this paper I describe a new approach to this old problem by a relatively simple and safe procedure which, in my hands and those of others in centres throughout the world, has produced satisfactory results in 70–80 per cent of cases.

The typical patient complains that he cannot flex his back without pain. Washing his face in the morning, tying his shoelaces or putting on socks or trousers all produce pain, because any attempt to flex the spine is followed by spasm of the paravertebral muscles. Often spasm is more marked on one side, adding scoliosis to the problem. The presenting symptom therefore is one of *pain*, and if this pain were to be removed, he would resume his normal life.

The pain is always initiated by the movement of flexion, which takes place partly at the posterior intervertebral or zygo-apophyseal joint. If an arthrosis exists in these joints, protective reflexes are initiated in the receptors, which are present in large numbers in the joint capsules producing the spasm of surrounding muscle groups.

Anatomy

The nerves to the zygo-apophyseal joints are the first extra-dural branches of the posterior primary divisions of the segmental nerves and are end nerves going only to these joints. They are not represented on the dermatomes and they travel medially to the facet region through the intertransverse ligament. They are completely separate from the sinu-vertebral nerves and have no connection—anastomotic or otherwise, with the intervertebral disc.

The anatomy of these nerves was first described by Pedersen, Blunck and Gardener (1956) and although Hirsch (1966) stated that pain transmitted through them from pathological changes in the posterior or intravertebral joint could account for much back pain, the role that they play in backache has been largely ignored in the belief that most backache is the result of abnormality arising in the intervertebral disc.

I think, however, that if any significant narrowing of the disc space does exist, it must follow that the relationship of the vertebral bodies will be altered. This must give rise to abnormal stresses on one or more zygo-apophyseal joint.

Cutting the nerves to the posterior intervertebral joints

If a man has pain in his back, his interest is entirely focused on relief. If the pain is arising from the disc or elsewhere it is evident that cutting these nerves to the posterior intervertebral joints will neither make it better or worse. Conversely, if the pain is arising in these joints immediate relief must follow the procedure.

It has been my experience, and that of a growing number of workers using this approach, that after this procedure a high proportion of patients experience dramatic relief of sciatica, cervical pain, brachial neuritis, and headache. After this relief I have found, in many cases, that neurological abnormalities also resolve over a period of some months, suggesting that in some way the capacity of the intervertebral space—through which the funicular portion of the segmental nerve has to travel, is increased.

Maybe this is due to a diminution of muscle tone as a result of more normal firing of the stretch and pressure receptors with which the joint capsules are so richly endowed. If one considers the anatomical relationships of the emerging segmental nerve in the intervertebral foramen, one finds *anterior to it*, part of the body of the vertebra above, the intervertebral disc, and part of the body of the lower vertebra. *Superior* to the nerve is the pedicle of the vertebra above.

The immediate *posterior* relation is the intervertebral joint itself. After the restoration of normal muscular tone the joint may well assume a more normal attitude, and as a result, increase the capacity of this important space, known to Sicard as the *carrefour de douleur*, or crossroads of pain. The procedure for sectioning this part of the posterior primary ramus, which I describe, is comparatively simple, pain-free and above all, devoid of danger. Skyrme Rees (1971), who described it first, has now completed 6,000 cases without serious morbidity during the past 14 years (i.e. since 1960). Following his first paper in 1971 a further 20,000 cases have been performed in centres all over the world.

I became interested in this work as part of my time was spent in organising a clinic for the relief of intractable pain. Many such departments are now operating throughout the world. Maher, a consultant physician in Rochdale, was the pioneer in the British Isles, but there are now many such clinics, most of which are supervised by anaesthetists.

The principle underlying this approach to back pain applies to most of what I attempt to do in the clinic. It can be summarised as follows:

In any benign condition where intractable pain is the major or only disability, or in any malignant condition, where all other treatment has already been applied and severe pain pervades all other experience, it is probably better to disconnect the painful area from the brain rather than to attempt to remove the affected region surgically.

The Minister of Health in Australia, Dr D. Evringham (1971) after an investigation into this procedure and the results, stated that in his opinion rhizolysis should precede all major surgical intervention for back pain, and also be carried out for all cases upon whom surgery had proved ineffective. I am sure that this opinion was prompted by the obvious simplicity and safety of the technique.

Clinical examination and investigation of patients

By the time cases have been referred to me most investigations have been carried out already. Plain x-rays are desirable to exclude bone disease, metastatic, or hormonal conditions, and ankylosing spondylitis. A urine analysis is done also. A full history is taken, paying special attention to traumatic incidents in the past. Next, a full clinical examination is carried out with special attention being paid to the locomotor and nervous systems.

The only finding which amounts to a specific test indicating that rhizolysis is likely to be of benefit comes from examination of the paravertebral region.

If deep pressure is exerted with the thumb about two centimetres lateral to the lower border of the spinous process, it is frequently found to elicit marked tenderness and sometimes to refer pain in the lumbar region down the leg or into the buttock—or to the shoulder or arm in the cervical region.

If one applied an electrode at these points, using an instrument called the 'Electrodia,' a

pronounced increase in electrical impedance can be demonstrated. I have seen this done in America. It is extremely impressive but the results of palpation are equally reliable. These points of maximal tenderness were described by an American physician called William Travel and are referred to as the 'points of Travel.' They correspond to the affected intervertebral joints.

In a typical case one finds one or more of these points, almost always on the same side of the spine. The points are now marked as is the space on the opposite side. The intravertebral joints possess bi-segmental innervation and for this reason it is necessary to treat the level above and below the affected joint.

Technique of bilateral subcutaneous rhizolysis

An intravenous needle is inserted into a vein in the hand or wrist through which diazepam, phenoperidine and droperidol, separately or in combination, can be injected to produce a calm pain-free patient. A sphygmomanometer is adjusted and blood pressure readings are taken during the operation. Next, epidural analgesia is provided via the caudal or lumbar route for cases in the lumbar region. I conduct cervical cases under slightly deeper neurolept-analgesia and local block.

The points to be treated are then infiltrated with one per cent lignocaine with adrenaline one part in 200,000—both for the purpose of enhancing the analgesia and to minimise haematoma formation. The distance from the skin to the transverse process is measured with a marker needle. A size 52L 'Beaver' cataract blade on a holder is used to section the nerves. Cuts are made in the inter-transverse ligament in the sagittal plane extending between the two transverse processes. I am conscious of cutting the nerve itself as it runs at right angles to the fibres of the ligament. As the inter-transverse ligament is the deepest point reached by the blade there is no danger of the blade causing any damage to the segmental nerve. Being a stab incision, no sutures are required. A pressure dressing is applied and passive rotation and extension of the spine is gently applied.

The patient is returned to rest in bed for about three hours, during which time the local analgesia disappears. After this interval, he gets out of bed and tries out some exercises—mainly rotary and flexing movements. The following morning he is allowed home and returns in three days to have the dressing removed. Frequent exercising is encouraged and a return to work within the week is usual. A few patients have insisted upon returning to work or golf within one or two days of the procedure.

Results

Skyrme Rees (1971) who pioneered this work, has claimed to obtain immediate relief in 88 patients out of every 100. However, I have considered my work as an effort to investigate this claim and will confine my observations to my own results and those of several other workers, who like myself learnt the technique from Skyrme Rees.

Shealy *et al.* (1973), in Wisconsin, where they have a large centre devoted to rehabilitation and the treatment of pain, have reported a series of 225 patients. These workers have modified the original technique and produce a radio frequency lesion of the nerve to the posterior intervertebral joint in the parafacet area which they monitor on an image intensifier. Their results are divided into three categories as shown in table 1.

TABLE 1
RESULTS OF FIRST 180 CASES (SHEALY *et al.*, 1973)

	<i>Failure</i>	<i>Good</i>	<i>Excellent</i>	<i>Total</i>
Previously un-operated	10	31	40	81
Previous lumbar surgery	13	11	14	38
Lumbar fusion	40	15	6	61
	63	57	60	180

This shows worthwhile improvement in 87 per cent of previously un-operated patients—70 per cent in those with previous lumbar surgery. As only 35 per cent of those who had previously undergone a spinal fusion were improved, their total figures are less good. In view of the rationale for rhizolysis, this is not surprising. It may be that spinal fusion is not so commonly practised in this country, and I have treated only four such cases, one of which achieved worthwhile relief. I question whether the procedure is justified as the anatomy is usually distorted and, probably as a result of scar tissue, haematomata are usually a problem. However, if one leaves out this category from the Wisconsin results there is a worthwhile improvement (i.e. good and excellent) in 82 per cent. If the cases of lumbar fusion are included the total worthwhile results fall to 65 per cent.

Toakley (1973), a neurosurgeon at the Mater Hospital in Brisbane, Australia, reported 200 cases of subcutaneous rhizolysis, employing the same technique as Rees, although toward the latter part of his series he abandoned caudal analgesia for local infiltration and neuroleptanalgesia. "To be on the conservative side, results were assessed as good if the patient was 70 per cent or better than he was before the procedure. If it was considered that he was from 50 per cent to 70 per cent better, the result was adjudged as fair. If below the 50 per cent improvement, the result was assessed as no change. On this basis, the results in 200 patients were:

Good result—125

Fair result—37

No change—36

Patients considering their pain subjectively worse—2."

Re-operation was carried out by Toakley in 20 cases, from the 'fair' and 'no change' categories, and the improvement here was much as indicated above, i.e. 80 per cent were improved on their status before operation. It is unfortunate that Toakley's criteria for determining these percentages are not explained.

Due to its complex nature, it is practically impossible to measure pain scientifically and these figures emphasise how much depends on the testimony of the patient in making an assessment. However, 62.5 per cent had a good result and 18 per cent had a fair one—so that one could say overall 70 per cent had a worthwhile improvement. In his conclusion, he states that in considering these 200 cases the distribution of pain as far as the ankle was rarely due to anterior nerve root compression. The procedure, he goes on to say, will make us re-think many of our ideas on referred pain, and also the function of the posterior primary ramus.

My results

I have been performing this procedure for 19 months in this country and so far have treated 184 cases, which include 23 in the cervical region. The figures I quote relate only to my first 100 cases as they provide me with a minimum follow-up period of six months. *En passant*, the immediate results of cervical cases is extremely encouraging.

In my first 100 cases the ages ranged from 19—83 years. Skyrme Rees has operated on patients as young as 12 years of age. I would feel strongly disinclined to treat patients during the active growth phase.

I judged my results in three categories:

A=excellent result, free of symptoms and signs within 12 weeks.

B=Good result. Returned to full activity but with some residual symptom or sign—often slight ache referred to as 'nothing I can't put up with, doctor'! These patients were all subjectively well pleased with the improvement. Also included in this group are those in whom any neurological signs persist. It is of paramount importance that these cases are followed up with great care and responsibility and no matter how well the patient may feel, neurological signs that persist unchanged after 12 weeks always warrant a patient's referral to either a neurological or orthopaedic colleague.

C=failures.

Group A. 48 per cent. Of these, eight had undergone previous surgery, seven had had laminectomy

or fenestration procedures. One had undergone spinal fusion. Four of these patients gained the excellent result after more than one procedure (one had three treatments).

Group B. 35 per cent. All are themselves pleased with the improvement, but some discomfort, however slight, remains. One of this category has had a previous spinal fusion and can now sleep at night without pain and claims to be much more mobile.

Parathesiae on the outer aspect of the calf or absent ankle jerk make further investigation mandatory as an indication of persisting L5 and upper sacral root compression.

Group C. Failures 17 per cent. So far I have seen no patient who claims to have been made worse by this procedure. Two of these cases had undergone previous spinal fusion and four had ankylosing spondylitis. Two of the latter disease improved initially but relapsed within ten days, suggesting that the epidural lignocaine had been of temporary benefit. One case in the 'C' category was a man of 40 with an equivocal myelograph—sent to me by an orthopaedic surgeon. He did not show any tender points as described (points of Travel). In spite of this negative finding I did a percutaneous rhizolysis with no improvement resulting. A week later I anaesthetised him when a typical lateral disc protusion was clearly demonstrated. A fenestration was performed and now he is free of pain and returning to work. Of the remaining ten cases one is an extremely disturbed personality who is undergoing psychiatric treatment. The others have been reviewed, but I have not felt that a second procedure would be of value. They were referred back to their previous doctor.

Toakley states that rhizolysis is of no value in ankylosing spondylitis and this has also been my experience. Apart from haematoma, there has been no morbidity associated with my cases. Haematoma tends to be marked in obese females and in those who have had previous surgery. When it does occur, an assessment of the result is not possible until all swelling has subsided. In the one patient who had an excellent result after a previous spinal fusion the pain was aggravated initially by the procedure. However, after about four depressing weeks the bruising resolved and she claimed to be completely free of her pain, which had been of ten years' duration.

Conclusions

No one has matched Skyrme Rees' results of 88 per cent, but no one has done nearly so many cases. If his figures have not been matched, however, those of other workers do not fall far short and any procedure which yields better than 65 per cent worthwhile results in the treatment of this most common and distressing disease is surely worthy of a place in our accepted therapeutic methods.

The classic syndrome of disc herniation with impaired straight leg raising, motor weakness, deep tendon reflex changes with or without sensory impairment, low back pain with sciatica, and positive myelographic findings is successfully treated with laminectomy and nerve root decompression by most surgeons when conservative measures fail (Mixer and Burr, 1934). This group however, represents less than one per cent of all patients complaining of chronic low back-pain and sciatica. Any attempt to relieve chronic symptomatology by disc surgery is liable to give disappointing results and is fraught with iatrogenic risk. I believe the advent of subcutaneous rhizolysis gives new hope of speedy relief to the remaining 99 per cent.

The main drawback is that this is a 'blind' operation without a means of checking what has been done. I have been involved with this comparatively new technique now for about two years. So far my impressions encourage me, but one must be cautious about the long-term results and a large number of these cases will be followed up for many years.

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REINSTATEMENT OF GENERAL PRACTICE

Students are taught to aspire to the highest rung on the ladder—the consultant—but they see that he is insulated by his team from much contact with the patient in situations where sympathy is paramount. It is usually left to the most junior member of the team to break the news to a husband that his wife is dying of cancer of the breast. Once again, I know, and the nurse knows, that the doctors are sympathetic but there has been a failure to communicate this to the patient.

How is this situation to be remedied? The first requirement is the reinstatement of general practice as the main site where training takes place. Each student should belong to a practice from the time he enters medical school. At first he would only observe but later he could be of real service to the practice. He would go out to hospitals for 'packets' of time to learn anatomy, physiology, biochemistry, therapeutics, pathology, and the clinical hospital disciplines. Physiology is probably best taught as a block near the beginning of the course, but pathology, biochemistry, and anatomy should be taught in these 'packets' all the way through the course. These subjects would mean much more to students as they would be related to the clinical subject under discussion. Even so, during all this hospital and scientific teaching, the student should return to his practice at regular intervals, and get to know the patients. In this way students would be associated with patients from the beginning of their medical course and might retain their sympathy for them.

It has been suggested that the Open University should train doctors and all the problems seem to be in finding the hospital practices. Here is a chance to put this very old method of training doctors into operation and see if we can produce a doctor who will provide a service that all patients have a right to expect.

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SINGLE-VISIT ORAL CHOLECYSTOGRAPHY

Six-hundred and eleven ambulatory-patient single-visit oral cholecystograms (using double the usual dose of contrast) were taken during a five-year period. Forty-five had gall bladder disease (almost all cholelithiasis), 32 with and 13 without gall bladder opacification. This rate of 7.5 per cent corresponds to reported abnormality in other series, using standard oral cholecystography with iopanoic acid.

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