Hunterian Oration

ON

SCIATICA: ITS VARIETIES AND
TREATMENT.DELIVERED BEFORE THE HUNTERIAN SOCIETY ON
FEBRUARY 27TH

BY

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WITH the recent celebrations of Hunter's bicentenary fresh in all our minds it is quite unnecessary for me to insist on the debt which the medicine and surgery of to-day owe to him and his tradition.

That Hunter himself was fully alive to the interests afforded by the subject of my address may easily be seen from the following quotation from one of his lectures:¹

"A gentleman complained of a pain in the hip, running down the outside of the leg and foot. Supposing it rheumatism I gave him James's powder, Dover's powder, and volatile tincture of guaiacum, but with no good effect. A liniment of opium to the leg and foot gave some relief. He at last perceived a tumour by the os ischii, just at the posterior edge of the gluteus maximus. This tumour increased and the person died. The tumour was found to fill a part of the pelvis, and had made its external appearance at the foramen magnum ischii, being filled with coagulated blood; but the pain in the limb seemed to have been produced by its pressing on a great branch of the nerve, but chiefly perhaps from the great ischiatic nerve being stretched very tight over the upper surface of the tumour. Here that happened which may often be observed: that is, the impression made on the trunk of the nerve gave a sensation as if it had been on the extremities of the nerve."

I make no apology for the choice of my subject for this Oration, trite though it may at first sight appear. The aggregate of suffering and of disability in the shape of work and wages lost through this common disorder is sufficient excuse for any attempt to clarify its causes or rationalize its treatment.

It is unfortunate that the term "sciatica" is one of those which have been accepted by the public and used by them to designate almost any kind of pain in the region of the lumbar spine, buttock, hip, and leg. Like certain medical terms—"rheumatism" or "anaemia," for example—it covers a multitude of sins; it sounds sufficiently scientific to lull the patient into a belief that the real nature of his symptoms is known, even allowing him to seek various forms of treatment—hydropathic, electrical, and so on—entirely on his own responsibility.

We should think of sciatica as merely signifying sciatic pain—that is, pain in the distribution of the sciatic nerve—without allowing it to connote any particular pathogenesis. This simple anatomical reminder will at once prevent us from lightly labelling as sciatica any case where the pain affects, for example, the front of the leg or the groin. It is hardly possible now to abandon the use of the term "sciatica," which is particularly useful in denoting one common variety of the disorder to which further reference will be made.

TWO TYPES OF SCIATICA.

For purposes of convenience we may speak of (1) a secondary or symptomatic sciatica, and (2) a primary or essential sciatica. By secondary I mean a sciatica due to some gross pressure lesion; by primary or essential I mean that large group of cases where no gross pressure lesion can be demonstrated, whose exact etiology is a matter of doubt and dispute. Strictly speaking, it is, of course, inadmissible to call such cases primary or essential—there is probably no such condition—but the term is useful and difficult to replace.

May I remind you very briefly of a few important anatomical points? The great sciatic nerve is formed in the sacral plexus from the anterior primary divisions of the fifth lumbar and the first and second sacral nerves; smaller branches join it from the fourth lumbar and the third sacral nerves. From its position on the posterior pelvic wall where the plexus is formed the great sciatic nerve passes into the buttock through the great sacro-

sciatic foramen between the pyriformis and superior gemellus muscles. It passes down into the thigh in the hollow between the great trochanter of the femur and the tuberosity of the ischium.

The part played by the fifth lumbar nerve in the production of symptoms is a point of considerable clinical importance; anatomically this may be in part explained by the longer and more oblique course it has to take to reach the plexus, as well as by other considerations to which I shall have to refer later.

Before proceeding to consider what I have called the primary sciaticas something must be said about the secondary or symptomatic forms.

SECONDARY SCIATICAS.

These may, of course, be due to a large variety of different lesions. Tumours of the rectum or of the pelvic organs, primary or secondary growths of the bones of the pelvis or of the vertebral column, disease of the hip-joint, the sacro-iliac joint, or the joints of the lumbar vertebrae; various affections of the actual nerve roots of the cauda equina within the theca or outside it, such as syphilitic inflammation or pressure by tumours; the effects of old injuries and disease of the spinal cord such as tabes dorsalis. All of these are possible causes of sciatic pain. In practice, however, the great majority of such possible causes are easily ruled out by a careful physical examination, which must in all cases include the vertebral column and hip-joint, the abdomen, including rectal and sometimes pelvic examination, and the nervous system.

In my experience it is relatively uncommon to find gross pressure lesions such as that produced by pelvic tumours, growths in the rectum, or abdominal disease overlooked. On the other hand, osteo-arthritis of the hip-joint is repeatedly overlooked as a cause of so-called sciatica, and much valuable time often wasted thereby on methods of treatment which can serve no useful purpose. Careful movements of the hip-joint by the observer should not produce pain in the case of true sciatica, nor is there any real limitation of the range of the movements of the joint. The importance of radiography is so obvious as hardly to call for mention.

I do not intend to weary you with a long discussion on the differential diagnosis of all the conditions which may produce a secondary sciatica, but it may, however, be of some value to remind you that the presence of any of the following signs or symptoms should at once arouse suspicion and seriously invalidate the diagnosis of a primary sciatica.

1. The distribution of the pain in any of the following areas: (a) the anterior aspect of the thigh; (b) the perineum, groin, or genital organs; (c) the abdomen or abdominal wall.
2. A motor paralysis of the leg or thigh or even a dropped foot.
3. Loss of the knee-jerk.
4. Any marked muscular atrophy.
5. The presence of the reaction of degeneration in any of the muscles showing slight wasting.
6. Any severe vasomotor disorders, and, of course, any such signs as oedema or trophic ulcerations.
7. Any interference with the nervous control of micturition, defaecation, or the sexual functions.
8. Lordosis or a gross deficiency in the movements of the spinal column.
9. Finally, the history of an operation for malignant disease should immediately raise doubts as to the innocence of any sciatic pains.

It is sometimes stated that a bilateral sciatica is always the result of some gross lesion—that is, a secondary sciatica. Certainly bilateral sciatic pains should always be regarded with grave suspicion, but I have satisfied myself in more than one case that it is possible for an essential or primary sciatica to affect both sides, as well as for a true perineuritis to affect both sciatic nerves.

PRIMARY SCIATICAS.

We must now turn to consider the primary or essential forms of sciatica. Here it is useful to divide the cases into two groups: (1) those where the symptoms suggest that there is a neuritis of the trunk of the sciatic nerve itself—a true sciatic neuritis; and (2) those where there is no direct evidence of such a neuritis, but where there seems reason to believe that the seat of the trouble lies higher up in the region of the lumbo-sacral vertebrae. We

can if we choose call this latter group "sciatic neuralgia," but in my opinion little is gained in this further subdivision in nomenclature.

Neuritis of the Sciatic Nerve.

There can be, I think, no doubt that a true neuritis of the sciatic nerve does exist. It is an interstitial neuritis, or perhaps rather a perineuritis, not in any sense comparable to the degenerative lesions of the nerves which are found in the cases of multiple neuritis or toxic polyneuritis due to such poisons as alcohol or arsenic. The great majority of cases do not afford us an opportunity of verifying by sight the exact nature of the lesion, but occasionally in cases of very long standing where the nerve has been exposed by open operation cicatrization of the nerve sheath with adhesions to surrounding structures has been demonstrated.

The precise etiology of these cases is generally uncertain. Like other forms of fibrositis, neuro-fibrositis, or neuritis it is now the custom to attribute them to some focus of infection in the body, and it is certainly good practice to institute a vigorous search for any such foci, and if they be found to remove them, if possible. Personally, however, I must confess to little success in this respect, and I doubt if I can recall a single example out of the many cases of sciatica I have seen where the finding of a septic focus, followed by its appropriate treatment, seems to have affected to any appreciable extent the course of the disease. Experience teaches that this form of neuritis occurs in diabetic subjects with a greater frequency than can be explained by mere coincidence; this possibility, therefore, must always be carefully borne in mind.

There are certain features which, I venture to submit, are of considerable value in the diagnosis of this particular form of sciatica. I have already mentioned certain diagnostic criteria which are of the greatest importance in establishing the presence of a gross pressure or secondary form of sciatica as distinguished from the form we are now considering. In the ordinary sciatic neuritis, as indeed in the other variety of primary sciatica which I shall describe presently, the sensory functions of the nerve are affected not merely out of proportion to the motor functions, but practically to their exclusion. A very different picture is generally presented by gross pressure lesions or by traumatic lesions of the nerve trunk. In these latter it is true that sensory symptoms may occur first, but they are soon followed by symptoms on the motor side, muscular weakness, dropped foot, gross muscular wasting, and, finally, even by trophic lesions. In the ordinary form of sciatic neuritis it is quite exceptional to find motor weakness of the limb. Some muscular wasting, it is true, may be found, but except in cases of unusual severity or very long standing it is generally slight in degree and more or less global in character—that is, affecting all the muscles of the limb equally, resembling, in fact, that wasting of the muscles associated with joint disease.

Little help in exact diagnosis is afforded by the well-known test of extending the leg at the knee with the thigh flexed on the abdomen. This manoeuvre will cause pain not only in a true sciatic neuritis, but in numerous other cases as well where the nerve or its roots are affected either by pressure or by inflammation. The simplest test for the presence of a real neuritis of the nerve trunk itself is tenderness on direct pressure. The points where this tenderness is most easily elicited are (1) over the sacro-sciatic notch, and (2) where the nerve enters the thigh midway between the tuberosity of the ischium and the great trochanter. In some cases also extreme tenderness may be found in the popliteal space and over the external popliteal division as this winds round the head of the fibula. Mere discomfort on pressure in these situations is insufficient to warrant the assumption of a real neuritis, which, if present, reacts to such a stimulus by a sensation of pain which is clearly acute.

Another almost invariable sign of a real neuritis is the disappearance of the ankle or Achilles jerk. Its absence, together with an exaggeration of the knee-jerk, is extremely common, and this combination constitutes quite a typical picture of the state of the deep reflexes in the

affected limb. It is remarkable with what rapidity the ankle-jerk may be lost; moreover, it is well to remember that it may never return, its perpetual absence being as it were a scar of the old disease which, many years after perhaps, may complicate the diagnosis of a new train of symptoms in the same patient.

Sciatic Neuralgia.

I pass on now to consider what is in my own view perhaps the most common form of sciatica. You will, I feel sure, all agree that even when the cases due to gross pressure lesions—that is, the secondary sciaticas—have been weeded out, and when the cases of definite neuritis of the nerve have also been excluded, there yet remains a very considerable moiety of uncertain nature. In this group the pains may be just as severe, just as persistent, and just as genuinely sciatic in distribution as in the forms I have already described. There may be in such cases practically no tenderness of the nerve trunk at all; further, the ankle-jerk is by no means invariably lost. A suggestive feature of these cases is the tendency of the pain to radiate, especially in the distribution of the fifth lumbar nerve root. It is quite common, for example, for the pain to appear first in the region of the outer side of the ankle or the outer aspect of the dorsum of the foot, not infrequently also round the head of the fibula. It is very uncommon, on the other hand, to find the pain referred to the sole of the foot or the actual calf of the leg. This so to say selective incidence of the pain upon the area supplied by the fifth lumbar nerve root, as compared with the areas innervated by the other roots constituting the great sciatic nerve, must in my opinion influence our views of the etiology of the symptoms.

At this juncture I should like to interpellate this question for your consideration. Why is sciatica so common? The correct answer to this question should provide a valuable clue to the problems of diagnosis and treatment. But can we find the answer?

Scoliosis.

There is one important symptom often associated with sciatica to which I have not yet referred—that is, scoliosis. In a certain number of the cases which do not yield rapidly to treatment and in a very large proportion of the chronic cases a scoliosis may be observed. It may be one of two kinds—the contralateral or the homolateral type. Of these the more common is the contralateral form. In this form a lateral flexion of the lumbar spine away from the affected side may be seen. Attempts by the patient, or the more forcible efforts of the observer, to correct this deformity immediately cause pains in the distribution of the affected sciatic nerve. Associated with this scoliosis in nearly every case is a rigidity of the lumbar spine, with defective flexion and extension as well as impaired lateral movements. Moreover, it is often possible, especially in thin subjects, to palpate an unusually firm and contracted condition of the erector spinae muscle.

There can be, I think, no doubt that this form of scoliosis is due to a muscular contraction, reflex in nature, exactly analogous to that with which we are so familiar in disease of joints elsewhere in the body. In this type of case with a contralateral scoliosis it is interesting to find further confirmation of the suggested lumbar vertebral site of the lesion in the not uncommon experience of a preserved ankle-jerk in association with severe sciatic pain; further, as Harris² has pointed out, saline injections of the nerve trunk are not as a rule successful in giving relief in those cases showing a contralateral scoliosis. This form of scoliosis will, as far as the lumbar articulations are concerned, produce a tendency to a wider separation of the articular surfaces of the intervertebral joints and enlargement of the intervertebral foramina on the side of the sciatic pain.

Less commonly found is the homolateral type of scoliosis, where there is a lateral flexion of the spine to the side of the affected nerve. One effect will be to lessen any possible tension on the roots or trunk of the nerve on that side. Harris² states that this form of scoliosis is readily amenable to treatment by the injection of saline solution into the trunk of the nerve at the sacro-sciatic notch or midway

between the great trochanter and the tuberosity of the ischium, an experience suggesting very strongly that in those cases with a homolateral scoliosis the lesion is probably a neuritis or a perineuritis of the nerve trunk itself.

Much less common than these two varieties of scoliosis is an alternating form, now homolateral and now crossed in the same patient. Putti² believes that these cases are due to a bilateral arthritis of the lumbo-sacral joints, and that the varying nature of the deformity is due to the need felt by the patient to rest the joints first on one side and then on the other.

THE CAUSATIVE LESION.

Enough has already been said to make clear my belief that in a large number of what I have provisionally called the primary or essential sciaticas the lesion probably lies higher up than is often supposed—in the neighbourhood, in fact, of the lumbar vertebrae themselves. We grant at once the existence of a true sciatic neuritis affecting the nerve trunk or its constituent roots in the plexus, in the latter case an intrapelvic situation. But there yet remains the large group where the symptoms suggest a vertebral or at any rate a juxtavertebral lesion. This group demands close attention.

For the views I am about to put before you I claim no originality. They are based on those of the French school, notably the work of Sicard⁴ and of Putti, as well as other orthopaedic surgeons. My excuse for asking you to consider them carefully is the fact that these conceptions have as yet found little mention in English textbooks. According to Sicard neuralgic pains in the distribution of a spinal nerve root, nerve plexus, or nerve trunk can be classified topographically as follows.

1. Neuralgias due to lesions of the posterior nerve roots within the spinal theca; to such the term "radiculitis" has been applied.
2. Neuralgias due to lesions between the posterior root ganglia and the origin of the nerve plexus. This condition Sicard has called "funiculitis," the funiculus being the name given to that part of the nerve root between the ganglion and the plexus. (It will be noted that the funiculus is that part of the nerve root which is mostly contained in the bony canal formed by the intervertebral foramina.)
3. Neuralgias due to lesions either of the nerve plexus or of the nerve trunk itself.

Sicard lays especial stress on the conception of funiculitis, and, since this lesion occurs in the situation of the intervertebral foramina, has coined the term "neurodocite" or "neurodocitis," indicating thereby some inflammatory lesion of the bony canal through which the nerve root passes, and by which the root is irritated.

It will be noticed that radiculitis is a lesion within the subarachnoid space, where the roots are still bathed by the cerebro-spinal fluid. Such lesions are not very common, if we except the syphilitic processes (including tabes), herpes zoster, and various forms of acute spinal meningitis.

The funiculus is a part of the nerve roots subjected to possibilities of very diverse types of lesions, traumatic and arthritic; and the region of the lower lumbar spines, especially the articulations between the fourth and fifth lumbar vertebrae and the fifth lumbar and the sacrum, is particularly prone to be affected, for reasons which I hope soon to give you.

The fact that a neuralgia is unilateral is, as Sicard points out, an argument in favour of an extra- as opposed to an intra-meningeal lesion—of a funiculitis rather than a radiculitis.

It is surely clear that the muscular contractions causing the rigidity of the spine and the scoliosis which we have already considered are powerful arguments in favour of such a conception as that of neurodocitis.

An examination of the cerebro-spinal fluid will provide, again according to Sicard, a further distinction between radiculitis and funiculitis. He states that in radiculitis a lymphocytosis of the fluid is found, while in funiculitis there is a characteristic condition of an increase in the protein without any increase in the cells, the "dissociation albumino-cytologique" of the French authors. Greenfield and Carmichael⁵ have found this increase in albumin in cases of sciatica up to as much as 0.1 per cent.—a very great increase. These authors state that in the cases with

a high albumin content the pain was severe and symptoms marked, suggesting an active process.

Sicard describes three clinical varieties of sciatica as follows:

1. High sciaticas—that is, those due to funiculitis or neurodocitis.
2. Middle sciaticas—those due to lesions either of the plexus or of the trunk of the nerve from the sacro-sciatic notch to its entry into the thigh proper.
3. Low sciaticas—those due to affections of the nerve in the popliteal space or of its external popliteal division in the leg.

His class of high sciaticas would include, therefore, those which I have here designated as vertebral or juxtavertebral; the class of the middle sciaticas embraces those common forms of sciatic neuritis or perineuritis; while the low variety is formed by those cases of a more or less localized neuritis or perineuritis of a nerve lower down in the thigh and popliteal space, and even of the external popliteal nerve in the leg or just above the ankle.

It is perhaps easier to follow Putti, who calls the high sciaticas "central" and the middle and lower forms "peripheral." This last division is useful, as it follows what I consider a difference in the usual etiology of the cases, the central forms being those due to vertebral lesions, while the peripheral forms are those to which the term of neuritis or perineuritis is more properly applied.

If this conception of the central forms of sciatica be accepted as due to a vertebral lesion, probably of the nature called by Sicard a neurodocitis—a term whose meaning I have already discussed—we have still to find the answer to the question, Why is sciatica so common? or, to put it in another way, Why should the lower lumbar region of the spine especially suffer in this respect?

The anatomical peculiarities of this region appear to afford a satisfactory explanation. Danforth and Wilson,⁶ in an interesting paper, have reported the results of their observations on the anatomy of the lumbo-sacral region in relation to sciatic pain. They found the intervertebral foramen between the fifth lumbar vertebra and the sacrum to be the smallest, and that between the fourth and fifth lumbar vertebrae the next smallest in this region. This is surely a significant fact.

These authors think that, anatomically, nerve pain due to joint lesions might occur, as regards the fourth lumbar nerve root, from (1) lesions in the intervertebral canal, and (2) at the lower margin of the sacro-iliac joint close to the great sacro-sciatic notch; and as regards the fifth lumbar nerve root, from lesions (1) in the intervertebral canal, (2) at the lateral margin of the joint, between the body of the fifth lumbar vertebra and the sacrum, and (3) at the lower edge of the sacro-iliac joint. They conclude by expressing the view that sciatic pain of the type studied is a symptom of disturbance in the lower lumbar spine, and that the site of the lesion is most frequently the lumbo-sacral junction, and the nerve chiefly involved is the fifth lumbar nerve.

I have already pointed out how in many cases the pain radiates especially, and sometimes solely, in the distribution of the fifth lumbar nerve root—for example, along the outer part of the leg below the knee and the outer aspect of the region of the ankle.

Other anatomical considerations are also of importance. It is well recognized that the fifth lumbar vertebra is peculiarly liable to congenital variations, of which the most striking is that termed "sacralization," though it is unlikely that this sacralization is often of itself responsible for sciatic pain. Putti has called attention to the frequency of various anomalies in the articular facets of the lumbar vertebrae, and especially of the fifth lumbar vertebra, which, he says, may alter the shape of, or reduce the capacity of, the intervertebral foramen, sometimes on one side only. Finally, the importance of the fifth lumbar vertebra as the foundation stone, as it has been called, of the whole spinal column must ever be borne in mind.

To Putti the central sciaticas are synonymous with a spinal arthritis, which he claims can always be demonstrated by good lateral and stereoscopic skiagrams. In this respect I must admit that my experience has been less fortunate.

Enough has been said, I hope, to convince you that there

are at least good grounds for supposing that in many cases of sciatica a vertebral lesion exists, probably of the nature of an arthritis, and that the nerve root principally affected is the fifth lumbar root.

But even when we have satisfied ourselves that our case of central sciatica is due to a lesion involving the nerve root or roots in the intervertebral canals we have yet to find the cause of this particular form of arthritis. This may be no easy task. Careful search for foci of infection must be made just as in other forms of infective arthritis elsewhere in the body. Teeth, tonsils, accessory sinuses, alimentary tract, and genito-urinary tract must all receive due consideration. I have already indicated my own experience of failure in establishing cause and effect in most cases in this matter of focal infection, but nevertheless I believe it is the right practice to make a careful search and treat adequately any infective foci found. And in this connexion it is well to remember the possibilities of a gonococcal infection, even of some antiquity, as a cause of the more chronic forms of inflammatory lesions of the spinal column. Such considerations, however, must never lead us to neglect the prompt symptomatic treatment of any case of severe sciatica.

From time to time the view is expressed that disease of the sacro-iliac joint is a common cause of sciatica. It will be readily appreciated from the brief anatomical digressions I have made that, theoretically at least, such a combination of cause and effect might easily occur. Actually, however, I believe the event to be rare, although I confess it is a possibility difficult to disprove. Certainly cases seldom if ever exhibit the classical symptoms of sacro-iliac disease, but these, it must be remembered, are those of an advanced disease of the joint, generally of a tuberculous nature. Quite minor inflammatory affections of the joint would certainly be very difficult to detect, both clinically and radiographically, although they might well be associated with sciatic pain.

There is, however, a considerable body of opinion, especially in America, which believes very strongly in the relation between sciatic pains and minor subluxations or strains of the sacro-iliac joint. This belief does not as a rule, I think, meet with general acceptance here, but it is a hypothesis well worth careful testing. Hoyt Cox⁷ has recently well summarized certain American views on this point. He distinguishes two types of sacro-iliac subluxation: (1) the traumatic form, usually, of course, acute, which may follow a fall or a heavy lifting strain; and (2) a postural form, usually chronic, due to long-continued faulty postures. In this form the back is unduly flat, the lumbar curve obliterated, and the ilium tilted forwards at an abnormal angle with the sacrum. The chronic forms may also result from infections, with subsequent relaxation of the ligaments of the joint.

It is in this second or chronic type that sciatic pains are likely to form one of the principal symptoms of a clinical picture in which the following signs may also be found: (1) an undue prominence of the sacrum; (2) a rigidity of the spinal muscles; (3) an obliteration of the normal lumbar curve; (4) a lateral curve of the spine away from the affected side; (5) marked tenderness on pressure over the affected joint.

DIAGNOSIS.

According to Hoyt Cox x rays are of little help in diagnosis, a fact which perhaps partly explains the hesitation with which these opinions on sacro-iliac subluxations are apt to be accepted. He states that the "pathological process consists of a definite displacement forwards of the ilium from the sacrum at the upper part of the joint, produced by extreme hyperextension of the spine, together with the strong muscular pull on the anterior part of the ilium."

The effects of trauma, however, are not confined to the sacro-iliac joint. There are obvious possibilities of injuries to the bony components of the lumbo-sacral region of the spine, and especially of the fifth lumbar vertebra, and fractures, even without displacements, are certainly capable of producing sciatic pain by involvement of the fifth lumbar nerve root itself, or of constant pains in the region of the buttock, referred later, perhaps, down the leg as well,

from involvement of the posterior primary division of this root. But, bony lesions apart, muscular and ligamentous injuries may lead to the formation of scar tissue which may implicate nerve fibres, perhaps of the superior or inferior gluteal nerves, leading to pain in the buttock and pains referred to the sciatic distribution. Such cases demand a clear appreciation of the site and nature of the injury before suitable treatment can be instituted.

TREATMENT.

It is obvious that in this, as in every condition in medicine, successful treatment depends on an accurate diagnosis, although palliative treatment may, of course, temporarily relieve all the symptoms. The treatment of the secondary forms of sciatica is clearly that of the causal factor, but where that is unfortunately not amenable to direct treatment we must be content with methods designed to mitigate discomfort and suffering.

Let us consider first the treatment of those cases where a real neuritis or perineuritis of the nerve is present. As previously indicated, a careful search for etiological factors will have been made, and any diabetic element in the case noted and treated. In the severe and acute cases rest in bed is nearly always essential. The application of a splint to the affected leg is sometimes advised, but in my experience this can seldom be tolerated; indeed, the maintenance of any position of the limb for long at a time is often almost impossible. Undoubtedly the most useful local method for the relief of pain is the application of heat in some form or another, whether this be achieved by poultices, fomentations, radiant heat, or diathermy. The last, when available, is a most useful method. Ultra-violet rays with the mercury vapour lamp or the tungsten are applied locally are also of value in the relief of pain.

Many authorities think highly of the value of electricity, either in the form of the simple constant current or of ionization. I must confess to having been little impressed by these methods of treatment, and now seldom employ them. For slighter cases some benefit may be derived from counter-irritation, whether this be effected by strong liniments or ointments, or by blisters, or by the old-fashioned method of painting with concentrated hydrochloric acid, but in any severe case such methods are generally of doubtful value. In the early stages of an acute neuritis massage is definitely contraindicated.

I cannot deal in any detail with all the innumerable drugs which have been used in this disease, either as supposed cures or as mere relievers of pain. Any condition amenable to medicinal treatment, such as constipation or urinary infections which may be a factor in the causation, must, of course, receive prompt treatment. The salicylates and the iodides are about the only drugs which seem to have any direct effect on these cases. The intravenous injection of sodium iodide has been advised, but I cannot say that I have found this method to possess any particular advantage over the ordinary form of medication by the mouth.

Analgesic drugs will nearly always be needed in cases of any severity, especially for the relief of pain at night. Aspirin, phenacetin, phenazone, may all be tried; "dialaceticin" is a useful compound, and I have also found "allonal" of value. A mixture of drugs which I have found effective is a cachet containing 5 grains of aspirin, 5 grains of pyramidon or amidopyrin, and a small dose of heroin, say one-eighth or one-quarter of a grain. It need hardly be said that the use of morphine should be restricted as much as possible, although in really bad cases its use for a time will be almost imperative.

Cases of sciatic neuritis which do not yield fairly rapidly to treatment along these lines, say in two or three weeks at most, may be very advantageously treated with injections of saline solution into the nerve trunk—a method which marks a distinct advance in our therapeutic armamentarium. This method is particularly indicated in cases where there is definite evidence of the presence of a true neuritis, such as marked tenderness on pressure of the nerve and loss of the ankle-jerk. The best sites for the injection are just below the sacro-sciatic notch and at a point on a level with the tuberosity of the ischium. The method is now well known, so that I need not enter into all the details, but it is important to make certain that

the point of the needle should enter the sheath of the nerve before the solution is injected; the sensations of the patient are the best guide to the position of the needle. Pain may be lessened by a preliminary anaesthetization of the skin with novocain and by injecting 1 or 2 c.cm. of the novocain solution into the nerve as soon as the point of the needle enters the nerve sheath. A considerable bulk of saline solution must be injected; I have been in the habit of using 100 c.cm. The pain produced at the time is not as a rule of great severity or of long duration, and can be controlled by an injection of 1/4 grain of morphine. The patient should remain in bed for at least twenty-four hours after this little operation. In many cases it is advisable to repeat the injection at a different point in the trunk of the nerve after an interval of three or four days. Harris² advises two such injections, one just below the notch and one on the level of the tuberosity of the ischium, as mentioned already.

Another method of value in these cases of sciatic neuritis is the injection of oxygen. A needle and tubing are attached to a cylinder of oxygen, the flow being carefully graduated; the needle is inserted so as to lie in close proximity to the nerve trunk, and enough of the gas is injected to produce a definite ballooning of the tissues.

The stretching of the nerve trunk by forcible manipulations is probably of little service. In a very few cases which have resisted all other methods of treatment it may be justifiable to cut down on the nerve and freely incise the sheath in a longitudinal direction—a procedure which has given relief in cases which had previously proved intractable.

If we believe that we are dealing with a case of "central sciatica," using that term in the sense already explained, it will manifestly be of little service to inject the trunk of the nerve. In such cases very great temporary relief may be obtained by an epidural injection—a method strongly advocated by Sicard. In this method a needle is passed into the sacro-coccygeal foramen and the solution injected into the epidural space in this region, where it can come into immediate contact with the nerve roots. Various solutions have been used for this purpose—normal saline, novocain, and, what I have always used personally with quite good results, a 40 per cent. solution of antipyrine, of which 10 to 20 c.cm. may easily be injected. It is advisable to anaesthetize the track of the needle with novocain, and to have the patient either lying on the affected side or in the genu-pectoral position; a long needle is also essential, especially in fat subjects. As a rule, the relief afforded by this manœuvre is almost immediate, and often quite dramatic; it is easily repeated if needed. This last procedure, coupled with the local and continued application of heat in some form or another, is usually successful in relieving most cases of central sciatica. Any focus of infection must be treated, and some help is afforded, I think, by the use of one of the many varieties of so-called protein shock therapy, such as the intramuscular injection of milk or the intravenous injections of *B. coli* or T.A.B. vaccine.

Putti is convinced of the importance of immobilization as the essential factor in the treatment of these central sciaticas. This he obtains by means of a plaster jacket, to be worn daily for increasing periods until it can be tolerated continuously. It is later replaced by a celluloid corset, which is worn for a prolonged period, six months at least, or even a year. My experience of this form of treatment is at present too limited to allow me to express any personal opinion, but the strong views of Putti must compel a careful attention.

On the other hand, in the more chronic cases of this kind I have become convinced of the great benefits to be derived by carefully designed manipulations under an anaesthetic. Manipulative treatment, again, according to Hoyt Cox and many others, is the only method of useful treatment in cases believed to be due to chronic subluxations of the sacro-iliac joint. In many of the cases of chronic sciatic pains following trauma, even where there is no reason for thinking that this joint has been affected, much benefit often follows manipulations or mobilization. Into the details of these methods space forbids me to enter, but I do wish to make an earnest plea for their consideration.

With this sketch of the treatment of certain forms of sciatica my remarks must be concluded. This disorder, so common and yet so crippling, affords the widest scope for the exercise of our science and our art, and although its care may not excite the admiration of the crowd or intrigue the fancy of the aspiring student, its many difficulties, diagnostic and therapeutic, will be amply rewarded by the gratitude of the patient who has been successfully and permanently relieved.

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SUPPURATIVE PYLEPHLEBITIS AND HEPATIC ABSCESSES COMPLICATING APPENDICITIS:

A CASE OF RECOVERY.

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In non-tropical countries appendicitis is the commonest cause of hepatic abscess,¹ but it is a rare complication and one which is as a rule associated with a suppurative pylephlebitis. In the majority of cases small septic emboli become detached from a thrombus in the immediate neighbourhood of an inflamed appendix, and travel through the superior mesenteric and portal veins to the liver, causing a suppurative pylephlebitis. Usually the emboli are numerous and highly septic, producing multiple abscesses throughout the liver and rapidly causing death. The abscesses occupy, as a rule, the right lobe, because of the distribution of the branches of the portal vein. It has been shown that there are two currents of blood in the portal vein—one from the superior mesenteric, which goes to the right lobe, and one from the inferior mesenteric and splenic, which flows to the left lobe. Occasionally a solitary abscess may develop, but this is exceptional. Typically the symptoms of a localized abscess are quite unlike those of multiple abscesses; the onset of the latter is associated with rigors, intermittent temperature, rapid prostration, and grave constitutional disturbances. The former starts less abruptly and does not display anything characteristic in its symptomatology; after a variable interval, usually some weeks, a patient who has had an attack of appendicitis develops a rise in temperature, malaise, and, later, perhaps enlargement of the liver associated with hepatic pain.

Clinically, hepatic abscess complicating appendicitis and suppurative pylephlebitis cannot be separated. When there is suppurative within the portal vein the liver is uniformly enlarged and tender, although pain may not be a marked feature,² and is often absent. There is an irregular septic fever and the complexion is muddy, sometimes distinctly icteroid; jaundice is, as a rule, of mild degree, often being absent. The liver is enlarged and tender, and the spleen in later stages becomes similarly affected. There is a high leucocytosis, and, according to Keene,³ the condition always ends fatally; while Osler⁴ states that pyaemic abscess (of the liver) and suppurative pylephlebitis are invariably fatal, and surgical measures are not justified unless an abscess shows signs of pointing.

It will be seen, then, that the condition is an uncommon one, and that recovery is extremely rare, and we feel that we are justified in publishing the notes of the following case.

A man, aged 30, was admitted to St. Bartholomew's Hospital on June 16th, 1927, having been sent up by his doctor on account of irregular fever. The history was as follows. He was in his usual health until May 7th, 1927, when he had an attack of epigastric pain which lasted four hours and was severe enough to double him up; later that day he vomited three or four times. He felt better the next day and continued at his work; but three days later, not feeling in his usual health, he consulted his doctor.