

published an exhaustive study upon the traumatic origin of neuralgia of the obturator nerve (*Revue de Chir.*, 1889, ix, 7, p. 574). Disorders in the nerves of the gluteus, the tensor vaginae femoris, and the pyriformis impair rotation of the thigh inward and outward. Abduction is also hindered, while the actions of walking, standing, and more especially climbing stairs, are performed awkwardly. For details the reader is referred to Duchenne-Wernicke, pages 261 and following, where the normal and pathological physiology of these muscles is carefully discussed.

IV. Diseases of the Sacral and Coccygeal Nerves.

The posterior small branches of the sacral nerves, four of which leave the vertebral canal through the posterior sacral foramina and the fifth through the foramen between the sacrum and coccyx, form numerous anastomoses, and thus constitute what is known as the posterior sacral plexus. The anterior, much larger, branches pass into the pelvis, where the first three and a part of the fourth, together with the lumbo-sacral cord (resulting from the junction of the fifth and a part of the fourth lumbar nerves), go to form the (anterior) sacral plexus. The plexus is triangular in form and rests upon the pyriformis muscle. The several nerves unite without much interlacement into an upper, large, and a lower, small, cord or band. The upper is formed by the union of the lumbo-sacral cord with the first and second and the greater part of the third sacral nerves and is continued into the great sciatic nerve. The lower becomes the pudic nerve. The plexus gives origin to a number of collateral branches—the superior and inferior gluteal, the small sciatic, and perforating cutaneous nerves and branches to the pyriformis, obturator internus, gemelli, and quadratus femoris. The great sciatic nerve, the largest nerve of the body, divides into the internal popliteal and external popliteal or peroneal, the latter again dividing into the anterior tibial and musculo-cutaneous, the former, which becomes the posterior tibial, terminating in the internal and external plantar nerves. The pudic nerve divides into the inferior hæmorrhoidal, the perineal nerve, and the dorsal nerve of the penis or clitoris.

The anterior branch of the coccygeal nerve is distributed to the integument over the back part and the side of the coccyx. It is joined by a branch from the fifth sacral nerve, while the posterior division is lost in the fibrous structures on the back of the coccyx.

The affections of the sacral plexus, which appear independently of any other disease, are chiefly sensory in nature. Motor disturbances, although they are perhaps numerically as

common as the former, are in the great majority of instances symptomatic of spinal disease. Careful studies upon the lesions of the sacral and lumbar plexus have been published by Charles K. Mills, in the *Medical News*, June 15, 1891.

Sciatica.

Among the sensory disturbances there is especially one disease which, owing to its relative frequency and obstinate resistance to treatment, has attained to much practical importance—namely, the affection of the sensory fibres of the sciatic nerve, the sciatic neuralgia or sciatica, *malum Cotunnii* (Cotugno, 1764). This may, as autopsies have shown, be due to an organic disease of the nerve, a genuine neuritis, or to a functional neurosis. In the former there exist varicose dilatations of the blood-vessels of the nerve, swelling, increase in volume, alterations in consistency, and a collection of serous exudation in the nerve sheath (Cotugno, Jasset). In the latter no anatomical changes can be detected. The neuritis may be due to disease of the neighboring structures, to a tenosynovitis in the lower leg (Erb), to affections of the vertebræ (spondylitis, carcinoma), or may appear independently, in which case, leaving cold out of consideration for a moment, we have usually to deal with mechanical injuries, either as the consequence of wounds, fractures, or as the result of protracted pressure (tumors of the pelvis, aneurisms, hernia, uterus gravidus, engorgement of the venous plexus of the pelvis, habitual constipation, etc.). The occupation must, moreover, be taken into consideration in the ætiology of sciatica. It may exert an injurious influence in one of two ways, either through the overexertion which it entails or through the exposure to frequent sudden changes of temperature. Of the former we have instances in those who work with the sewing machine for weeks and months for several hours a day, and in those who are always lifting heavy weights (stevedores, blacksmiths, etc.). To this class is thought to belong "*le lumbago des forgerons*," described by Maisonneuve (Hirt, *Krankheiten der Arbeiter*, iv, 90). Of the latter we have instances in puddlers and those who work at smelting furnaces, etc. Sciatica is frequently seen among such people, and seems to affect more commonly the left leg, probably because in throwing the coal into the furnace it has to be extended more forcibly (Chiene, of Edinburgh, and Hirt).

As a symptom sciatica is often seen in spinal affections (myelitis, spinal meningitis), in diseases of the general nervous system, especially in tabes, where it often appears bilaterally, also in diabetes. As a sequela it has been described as following typhoid fever. Whether malarial intoxication can ever be the cause of it is uncertain. It is sometimes seen in the course of syphilis. In lead and mercury poisoning it plays an entirely secondary rôle.

Symptoms.—Among the symptoms of sciatica pain is the most important. The motor disturbances which sometimes occur in the course of the disease—tremor, clonic spasmodic movements, the difficulty and awkwardness in moving which interfere to a greater or less extent with standing and walking—have to be looked upon simply as the result of the pain. This varies greatly. At first it may be dull and quite bearable, but later boring in character, extending over the whole lower extremity and persisting without intermission, so that it constantly occupies the attention of the patient and forces him to a frequent change of position; or, again, it may appear in attacks, with intervals of comparative ease, so that the patient feels fairly comfortable and is able to follow his occupation. During the seizures it may be of such excruciating intensity that it can only be compared with Fothergill's faceache or the lancinating pains of tabes.

The patient suffers usually more intensely at night after going to bed, or at least he complains more at that time, often because he can not bear the extension of the leg, often perhaps because his attention is then less liable to be distracted. Yet even in the daytime the pain may reach a considerable pitch, especially when the patient has been making attempts to walk or has been standing too much. He may have perfect ease for hours when lying quietly, and yet a few moments of flexion and extension of the affected extremity are sufficient to throw him back into the most distressing condition. The extent of the pain also varies; generally it is felt over the whole posterior surface of the thigh and the distribution of the external popliteal nerve. It may radiate into the region of the healthy sciatic and the lumbar plexus of the affected side. The posterior tibial nerve usually remains intact. Examination almost always discloses the existence of tender points, one, for instance, at the exit of the nerve from the pelvis, one at the lower margin of the gluteus, one in the popliteal space, one on the capitulum

fibulæ. There may be others, but their occurrence is uncertain and their position changeable.

Sometimes patients with sciatica are seen to put all their weight upon the healthy leg in order to diminish the pain in the affected extremity. This causes the trunk to be bent toward the healthy side and the costal margin to approach the ilium, a position which may become so habitual that a genuine scoliosis may be developed, the convexity of which is directed toward the healthy side; in exceptional cases the reverse is the case—namely, the convexity of the curvature is directed toward the affected side. Remak (cf. lit.) is of opinion that the patient is able to convert the "normal" into the "abnormal" scoliosis as his comfort may demand, while Brissaud regards the abnormal position as the result of a reflex spasm. I have known several cases in which this secondary scoliosis persisted after considerable improvement of the primary affection, whereas in other instances I have seen it disappear when the cure of the sciatica was complete.

If we have to deal with a genuine neuritis trophic changes will be found to develop, especially more or less marked atrophy of the muscles in various regions supplied by the sciatic nerve (Guinon et Parmentier and others), with reaction of degeneration (Nonne). The patellar reflex seems in such cases to be considerably diminished. An exaggerated knee jerk in the course of a peripheral neuritis has, on the whole, to be looked upon as exceptional (Strümpell, Möbius). In sciatica I have never seen it. If the trouble is purely functional the muscles and reflexes remain, even after years of suffering, unaltered. Other sensory changes—diminution of the sensibility, anæsthesias, paræsthesias—occur, but take a very secondary position to the dominating feature of the disease, which is pain.

Course.—The course as well as the duration varies greatly, but we may state as an undeniable fact that it is exceptional to find cases which last but a short time and end with complete recovery. Mostly it is a question of months and years before any decided lasting improvement is brought about. On the other hand, remissions are not rare. They may last for months, and the condition of the patient may be such that he begins to be confident of a permanent cure, when suddenly, often without any appreciable cause, sometimes in consequence of a long walk, the pain again makes its appearance with un-

diminished intensity and the treatment has to be started all over again. The more frequent such relapses, the more gloomy becomes the outlook for complete recovery.

Diagnosis.—Great care should be exercised in the diagnosis, and we should first endeavor to decide whether the trouble has to be regarded as an idiopathic affection or as a symptom of another malady, and more especially in bilateral sciatica should we be on the lookout for a spinal disease or a disease of the general nervous system, such as tabes. The examination of the urine for sugar should never be omitted. If this proves negative, and if we can exclude general nervous diseases with certainty, we should proceed to analyze the pain, to examine into its nature, the time of its occurrence, its seat and extent, and should keep in mind that there are other than nervous affections that are associated with violent pain in the lower extremities; for instance, acute rheumatism of the lumbar muscles, lumbago, also inflammations in the hip joint, chronic hip disease, malum coxæ senile, as well as gouty affections and psoas abscesses. In all such instances the immobility of the extremity, which also exists in a pure sciatica, makes the examination difficult, and only after persistent repetitions shall we be able to obtain a clear idea as to the true nature of the trouble. Although it may be going too far to say with Hutchinson that out of twenty cases diagnosed as sciatica in nineteen there exists no trouble whatever in the nerve (Medical Times and Gazette, 1882, vol. i, No. 1648, page 35), there can be no question but that here many diagnostic sins are committed and that there are many cases called sciatica after a superficial exploration which later prove to be something entirely different.

Treatment.—The treatment of sciatica should vary according as the neuralgic pains constitute merely a symptom or result from an independent affection of the nerve itself. In the former case our therapeutic measures, of course, must be directed against the underlying disease (diabetes, tabes, syphilis, etc.). If we have to deal with sciatica as an affection by itself our treatment should be systematic and carried out on definite lines. Our first rule should be never, or at any rate only in exceptional instances, to withdraw blood. If there are old scybalous masses in the bowel which press upon the nerve and thus cause the pain, considerable and lasting improvement may be brought about by the removal of these, and a course at Carlsbad or Marienbad may cure sciatica in such cases

more quickly and surely than the most careful use of electricity. Next, especially when we have grounds for suspecting an inflammatory condition of the nerve, we should try the application of counter-irritants to the skin, fly-blisters or the so-called *points de feu* (with Paquelin's thermo-cautery). The former more particularly, which have been used by Cotugno and Valleix, deserve to be recommended, as they prove generally very effectual if used early in the disease; they may be applied along the course of the nerve on the thigh or in the sacral region (Anstie). Less benefit is usually derived from irritating inunctions and plasters, which may, however, be given a trial; for instance, we may employ one of Betz's plasters—empl. oxycroc. 15.0 (℥ss.); arg. nitr. pulv., 1.0 (grs. xv)—allowing it to remain on the skin until it drops off of its own accord. Among other drugs for inunctions besides veratrine [0.1 : 10 lard] the narcotics (preparations of opium, belladonna, hyoscyamus) may be useful. Finally, the chloride-of-methyl spray may be recommended. This, however, should be used with great care; otherwise it may be followed by a cellulitis, erysipelas, or even gangrene. The desired effect does not always follow (cf. Steiner, Deutsche Med.-Ztg., 1891, 102, p. 1158).

From internal medicines I have never seen any lasting good results; besides antipyrin and antifebrine, iodide of potassium has been used from time immemorial, also quinine and all the nervines. Recently solanine has been recommended, fifteen to twenty centigrammes (grs. ijss.–ijjss.) a day. In my own experience this drug does not possess much value; neither does the oil of turpentine given internally in capsules containing fifteen minims ten or twelve times a day. In short, I consider all internal medicines, unless the case be one of syphilis, as useless and inadvisable, for, owing to the long duration of the trouble, they would have to be taken for months with great detriment to the stomach and to the digestion. More is accomplished by external measures—massage and electricity. Both have the disadvantage, however, that they act very slowly and that their application causes more or less violent pain, a remark which applies more particularly to a systematic and an energetic use of massage (Schreiber and others). The faradic brush and the combined current used by De Watteville are also very painful, but both can be recommended with a clear conscience. With regard to the best manner in which the electricity should be

given, as we have said before, we now repeat that every one has his own method, in which he has most confidence because he is most familiar with it.

If we are forced to send our patients to the springs, we may first of all recommend non-medicated hot springs or hot brine springs. Among the former may be mentioned Gastein, Herkulesbad, Johannisbad, Teplitz-Schönau, and Wildbad; among the latter, Wiesbaden, Nauheim, Rehme, and Baden-Baden. At hot sulphur springs, for instance, Landeck, Teplitz-Trencsin, and Pistyán in Hungary, such patients do very well, but it is advisable not to raise their expectations too high, as often the results of a stay at the springs are not very striking. Seabathing is not always borne well by patients with neuralgia. At any rate, it is well to begin with places on the Baltic and to select first those where warm sea-water baths can, if necessary, be also obtained—e. g., Colberg, Misdroy, Zoppot, and others. In severe cases, particularly if there occur transient attacks of intense pain, morphine can not be dispensed with. Subcutaneous injections in proper amounts and at the proper time will do the patient no harm, but will afford him unspeakable relief, such as can be expected from no other drug.

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Far less frequently—we might say, only exceptionally—are the individual branches of the sciatic nerve the seat of neuralgia; thus we may have an affection of the plantar nerves, and sometimes the hyperæsthesia in their distribution may be so marked that the patient is absolutely prevented from standing or walking. Barbillon (cf. lit.) has devoted a careful study to this so-called plantar hyperæsthesia without, however, being able to decide whether the disorder is of spinal origin, or whether it has to be regarded as a so-called dermatalgia, or again as a disturbance in the nutrition of the fine nerve endings. The first explanation is supported by the fact that usually both feet are affected; the last that it often occurs in people who have to stand a good deal. It has often been known to occur as a sequela of typhoid fever. Cures are said to have been effected by blisters, or by the application of a spray of methyl chloride; bathing the feet for some time in hot salt solution has also been recommended. The neuralgia of the external plantar nerve which S. K. Morton has described as metatarsalgia (Annals of Surgery, June, 1893), manifests itself in paroxysms of pain in an area extending from the third to the fifth metatarso-phalangeal joint; during these paroxysms the patient is unable to walk and is forced to take off his shoe. Badly fitting shoes and traumatism seem to be the causes of the affection. Sometimes it may be necessary to resect the head of the fourth metatarsal bone.

The pudic nerve, which supplies the bladder, the rectum, the perinæum, and the external genitals, is often the seat of neu-