A CASE OF SYPHILITIC SPINAL LEPTO-MENINGITIS WITH COMBINED SCLEROSIS.

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THE patient in question first came under observation in the Royal Infirmary, Dundee, where he was under the care of Dr. Mackie Whyte, and afterwards in the Dundee Poor-house Hospital, again under the care of Dr. Whyte, to whom I am indebted for permission to publish the notes of the case and for the material for microscopic examination. Altogether the patient was under observation from October, 1897, until February, 1900, when he died. The notes of his case while in the Royal Infirmary I give verbatim, as nothing of them is superfluous.

R. L., aged 61, labourer, was admitted to the Royal Infirmary, Dundee, on October 7, 1897.

Complaint.—(1) Pain in right side of chest; (2) shooting pains in left arm and leg.

Duration.—(1) One week; (2) two years.

Previous history.—He has always been a strong healthy man, never having had any illness, except measles or scarlet fever. His work has been heavy, and has necessitated constant exposure to weather. He has suffered from "rheumatism" at times, but has not been subject to chest troubles. He has been a total abstainer for eight or nine months, but before that was a heavy drinker. He is a non-smoker. There is no history of venereal disease. Micturition has been more frequent for the last nine months, obliging him to get up three or four times at night.

Family history.—Negative. Married. Wife and six children healthy.

Present illness.—Two years ago, for no reason, a pain came on one night in his left heel; the foot and leg as far as the knee

were swollen next day, but the swelling subsided without treatment and has never returned. The pains have continued more or less ever since, shooting sometimes from the heel up the leg, and up to the shoulder and down the arm, and sometimes in the reverse direction. Rubbing relieves the pain, which is severe enough to keep him awake at night. They have never affected the right side. In the left hand he often feels a sensation "like pins and needles." Walking is affected, as he never feels as if he were gripping the ground with his left foot. His memory has been failing for four or five years. The grasp of the left hand is weakened. A week ago a pain started in the right side of the chest, associated with a cough, worse at night, but relieved if he lies on his right side. He has lost three stone weight in four years. Suffers from frontal headache.

Physical examination.—He is a powerfully-built man of fairly good colour. Tongue clean and moist, not tremulous. Heart and lungs appear healthy.

There is tenderness all over the right side of the chest, extending as high as the third intercostal space, reaching to the middle line back and front, worst over the points of each of the intercostal nerves. There is tenderness in the right lumbar region and over the liver. No enlargement of liver or spleen. There is considerable loss of power in the left leg. Patellar and plantar reflexes exaggerated; no ankle clonus. Hyperæsthesia all down left leg, tenderness especially marked over the course of the sciatic nerve. No wasting or coldness, no ataxia; but the left leg is dragged when he walks, and he seems afraid to trust it. He says there is pain in the heel when walking, also that the ground is "not gripped properly." He can stand with his eyes shut, but cannot walk along a straight line. The grip of the left hand is very feeble. Dynamometer, right 30, left 10. There is hyperæsthesia of the left arm, and a feeling of pins and needles, especially in the hand. The pupils respond to light.

October 8. Urine: specific gravity 1006, acid, colourless, no albumen. The excess of sensitiveness is noticed on the scalp and face, as well as on the body, and is more marked on left side.

October 11. Sleeps well. Pain still severe in left side.

October 19. Patient exhibits a general condition of muscular weakness all over his body. His gait is tottering and shuffling, with very short steps, hardly raising his feet, but sliding them along. The left leg is distinctly the weaker. The arms are also very weak, the left more so. Dynamometer, right 30, left 20. He cannot protrude his tongue much further forward than his teeth. The movements of the eyes are good and the reactions of

the pupils normal, but the pupils are small, and the right somewhat smaller than the left. There is a general cutaneous hyperæsthesia all over the body from head to foot, and this is more marked on the left side than on the right. There is ataxia of the upper extremities, possibly due to weakness. No ataxia of lower extremities can be demonstrated, and the positions of the legs seem fairly well appreciated. Besides the hyperæsthesia, no affection of sensation is to be found. The deep reflexes appear exaggerated, possibly due to hyperæsthesia, as on the left side a tap on the knee or wrist evokes an exclamation of pain, and sets the muscles into spasmodic clonic contractions. No ankle clonus. Plantar reflexes well marked. Abdominal reflex well marked on right side. Takes food well, but has great difficulty in feeding himself. Peculiar odour about patient's skin. Sphincters act efficiently.

November 1. Cannot open mouth above three-quarters of an inch. Gums soft, and bleed easily. Speech is wanting in force, and such as one would expect from the weakened muscular condition.

November 19. Sent to poorhouse.

His temperature was usually slightly above normal, sometimes reaching 100° and once 101°. Towards the end of his stay it became subnormal.

From the notes of his case while in the Poorhouse Hospital I extract the following :—

November 7, 1898. Temperature 97·4°. Urine : specific gravity 1026, acid, no albumen. Patient was in hospital ten days ago for pain in, and inability to move, his right knee. He was put under chloroform, but nothing could be made out ; the case was supposed to be one of hysteria. He now returns, complaining of pain in, and inability to move, the right hip-joint. On examination, nothing is made out.

May 17, 1899. Continues in a very helpless state, rigidity being the chief characteristic. This is especially to be observed along the spinal column, right shoulder, right hip, knee, and to a less extent in the right elbow and left knee. No joint deformity can be made out, and there is no special muscular atrophy connected with any joint, although the whole muscular system is below par. Attempts at movement cause pain. He manages to feed himself in a slow and tremulous fashion with his right arm.

January 19, 1900. Rigidity increasing. The left elbow and shoulder are now both involved, and the jaw is stiff. Pain only present on movement.

February 10, 1900. The patient can now hardly speak ; his lower jaw is rigid, and the left arm is kept close to the side. The shoulder is also rigid, movements in the elbow are slight, the right fingers show voluntary movement. The pectoral muscles are firmly contracted, the muscles of the abdomen rigid and board-like. Lumbar region is arched. Breathing entirely abdominal and shallow. Head is rigid, somewhat extended, and rotation is impossible. Temperature in rectum usually 95.8° , never more than 96° . Patient has not spoken for two days.

February 16, 1900. Eyes strongly deflected to right, pupils small, and the head is more retracted. He is quite apathetic. Body all over extremely cold. Thermometer in rectum registers 92° .

February 17. Died.

Diagnosis during life was chronic spinal meningitis.

SUMMARY OF SYMPTOMS.

The case ran a course of about four and a half years. The symptom first noticed was pain referred to the left heel, followed by shooting pains up or down the left side. There were also referred pains in the right side of the chest. Next came hyperæsthesia, not only cutaneous, but also muscular ; for there was pain on using the muscles, and as result of the hyperæsthesia of the bladder we have frequency of micturition. There was muscular weakness and great loss of weight, and finally rigidity, which involved the muscles of respiration and led to death. These symptoms all point to thickening of the spinal membranes, with compression of the nerve-roots. They were not symmetrical on the two sides, and proceeded from below upwards. In addition there was ataxia of the upper limbs and doubtful spasticity of the lower, symptoms which imply involvement of the cord, and would be easily explained by the pathological changes actually found. No history of syphilis was obtained, but the changes in the arteries found and described below leave very little doubt as to this being the cause of the disease.

The very low temperature before death was no doubt due to deficient aeration.

FIG. 1.
(Semi-diagrammatic).
 Spinal Cord, Cervical region.

FIG. 2.
(Semi-diagrammatic).
 Spinal Cord, Dorsal region.

FIG. 3.
(Semi-diagrammatic).
 Spinal Cord, Lumbar region.

FIG. 4. $\times 50$.
Periphery of Lateral Column in Cervical region.

FIG. 5. $\times 200$.
Some Arteries from Posterior Column in Cervical region.

The retraction of the head and deflection of the eyes just before death indicate some basal meningitis.

PATHOLOGY.

By the kindness of Dr. Mackie Whyte I received the brain and spinal cord.

The brain presented nothing abnormal to macroscopic examination, but as it had been in spirit, it was impossible to ascertain the presence or absence of basal meningitis. The spinal dura mater appeared quite normal, but the pia mater was tough, thick, and adherent firmly to the spinal cord, especially over the dorsal half of the circumference.

Preparations of the cord at about ten different levels showed more clearly this increase in thickness of the pia mater, and in addition sclerosis of both lateral columns throughout the length of the cord, involving both the direct cerebellar and the crossed pyramidal tracts. In the cervical region there is also sclerosis of the posterior columns, here even more marked than that of the lateral, and involving especially the postero-external tracts and the posterior root zones of Lissauer.

On close examination of the sclerosed columns, the most strikingly pathological condition is found in the arteries. These are in a condition of advanced arteritis, both endarteritis and periarteritis; the endothelial lining of the intima is proliferated until the lumen is extremely small or obliterated, while the media and adventitia are replaced by connective tissue crowded with nuclei. The arteries thus form almost solid columns, whose cross-sections take up a large proportion of the area of the section of the affected region, and contribute most to the naked-eye appearance of the sections.

These changes in the arteries are usually considered to be characteristic of syphilis; hence the title of this article.

Sections of the medulla at various levels show the pyramids along their whole length to be in the same condition as the lateral columns of the spinal cord. This is more remarkable than appears at first sight, for while regarding

the lesions in the cord alone we could assume the disease to originate in the arteries, for the districts affected are all served by the posterior spinal arteries and their branches, the anterior spinal artery and its area of supply being healthy, or but slightly affected. But when we come to the medulla we find the pyramids supplied by the anterior spinal artery are the only diseased parts, and that here the anterior spinal artery is the diseased artery, the others being healthy. This almost forces the conclusion that the origin of the disease is really in the motor tracts. As a corollary to this we might assume that the lepto-meningitis, to which the symptoms were due, was secondary to the arterial disease, and therefore to the disease of the motor tracts.

Sections of the pons showed an increase of nuclei in the coats of the arteries supplying the pyramidal fibres, but nothing approaching the condition lower down.

Sections of the cortex from the motor region showed healthy arteries and abundant healthy pyramidal cells, while tangential fibres were well developed. The nerve-cells in the gray matter of the spinal cord were healthy.