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JOINT LESIONS DUE TO DISEASE OF THE SPINAL  
CORD, WITH A REPORT OF TWO CASES.

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## JOINT LESIONS DUE TO DISEASE OF THE SPINAL CORD, WITH A REPORT OF TWO CASES.

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### SPINAL ARTHROPATHY ; ARTHROPATHIA TABIDORUM ; CHARCOT'S DISEASE.

JOINT diseases occurring in persons having some affection of the nerve centres, or of the large nerve trunks, have been recognized for a goodly number of years. From the resemblance of these joint lesions to those occurring in certain forms of rheumatism, they were for many years all classed together as rheumatoid arthritis, and because of this mixing of the pathological conditions due to disease of the nerve centres, and of those of purely a rheumatic nature, Dr. J. K. Mitchell, of Philadelphia, in 1831 was led to advance the theory that rheumatism was a spinal neurosis. This theory was more or less accepted ; and not until 1868 were the joint lesions of a neurotic origin classified by themselves. At that time Charcot gave a lecture on the relation of these diseases to tabes dorsalis or locomotor ataxia, and from that time the disease has been most commonly known by his name. Some years later, Dr. Thomas Buzzard again called attention to the disease, and since that time it has attracted more or less attention from the various neurologists, and finds mention in nearly all of the works of surgery. To the orthopedist the subject is, of course, of considerable importance, particularly for differential diagnosis.

During the past year I have been fortunate enough to see two patients with this disease, and they are reported in detail for our study. Both were men ; and the etiology in the two cases is entirely different : the first probably of specific origin, while the other was due to direct injury to the spinal cord.



CASE I.—W. A. D., a man, fifty-three years of age; married, and a porter by occupation. He has a good family history, has been temperate in his habits, and denies ever having had any venereal disease. In 1885 he had the left great toe amputated for caries, which apparently began as a perforating ulcer. Aside from this he has been well; until the last few years, since which time he has been "running down;" has lost some flesh, and has been unable to do as much work as formerly. He has never had rheumatism, but recently has had indefinite pains in various parts of the body, and at times they have been shooting in character, starting in the upper part of the body and running down into the pelvis. There have been no other symptoms.

In the early part of March, 1891, while stooping to pick up some object, he felt a sudden sharp pain apparently in the right ankle, after which he was unable to bear his weight upon this foot. Previously there had been no lameness or swelling in any part of the body. He was obliged to lie down, and for a short time there was some pain on motion of the leg, with some swelling about the hip. The pain ceased entirely in a few days, and he was then transferred to the Boston City Hospital, where he was put to bed with weight-and-pulley extension to the leg. At this time his physical examination was something as follows: Pale and cachectic, fairly well developed, and poorly nourished. Heart regular and strong; lungs normal. The right leg straight, with foot moderately everted, and  $1\frac{3}{4}$  inches shorter than the other (measured between the anterior superior spine of the ilium and the internal malleolus). There was some swelling and induration all about the hip, but neither condition was marked. There was no pain, tenderness, or ecchymosis. The striking feature was that the leg could be moved about in all directions without any limitation of motion, and the femur could be slipped up and down upon the ilium, allowing a play of three or four inches, without any pain. On this motion there was a marked grating very like crepitus. The trochanter rotated upon about the normal radius, as if the neck of the bone were intact. The acetabulum could not be felt; there was no slipping in or out on motion.

The sensation was diminished in the left leg, otherwise there

was nothing abnormal. The motion and outlines were as they should be.

The right pupil was smaller than the left—reaction not noted. The patellar reflexes were absent, while the cremasteric reflexes were present.

Nothing of interest occurred until about a month later, when he began to have occasional pains in the other hip, but nothing abnormal could be detected on careful examination.

In the latter part of May, 1891, he left the hospital, and since that time he has been wholly under my care. He was allowed crutches, and was urged to move about.

Three months later the left hip went through exactly the same condition as the other joint, except that there was absolutely no pain, and the patient was about all of the time.

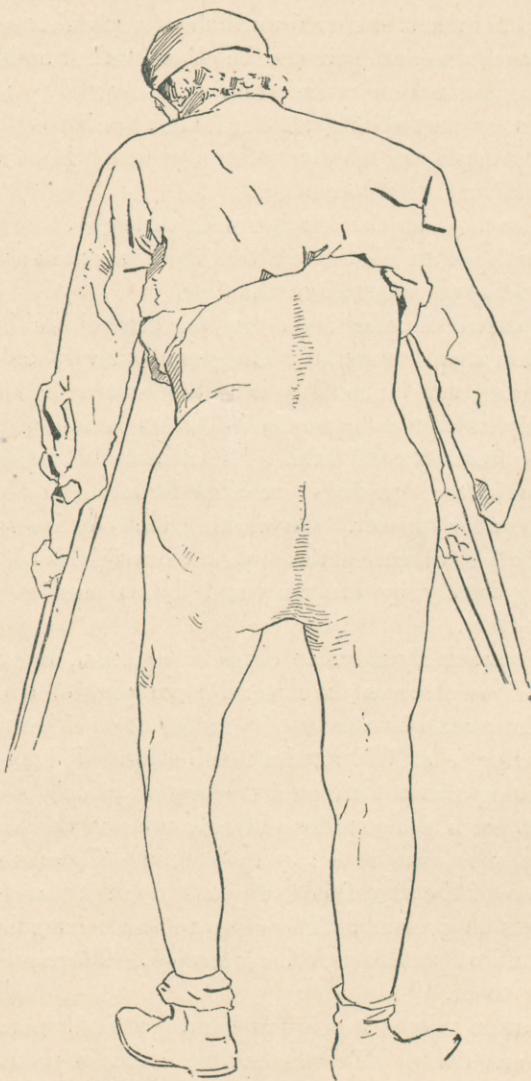
At the present time he is in very fair general health, he sleeps well, and has a good appetite. He gets about very well with the aid of crutches, and by holding on to the balustrade he can go up stairs nearly as fast as a person in health would walk. He is entirely free from physical pain. The attitude in standing is very well shown in the drawings: marked lordosis, hips prominent, and legs apart for support. On walking, the body is swung to one side, and the leg, which lengthens when the weight is off, is thrown forward, apparently by the psoas and iliacus muscles. There is marked toe-drop.

Both hips are freely movable on passive motion, and besides the normal motions there is the up-and-down play of two or three inches. The acetabulum cannot be made out on either side. The marked grating is still felt, and on both sides. There is considerable thickening about both great trochanters, which is apparently bony, and there is also considerable thickening on the inner surface of the ilium, which can be felt by the rectum. There is no redness or induration of the superficial soft parts, no muscular spasm, and no tenderness on pressure. There is one small irregular cicatrix above the internal malleolus, otherwise none. There are no nodes on the long bones.

The sensation in both legs is equal and practically normal. The knee-jerks are absent. The cremasteric reflex is present on the left side, but absent on the right. There is no ankle clonus. The

pupils are unequal, and react slightly to accommodation, but not at all to light. There is incontinence of the urine, and the bowels are very sluggish. The sexual power is absent.

FIG. 1.



CASE II.—A. B., a man, thirty-five years of age; married, and a cabinet-maker by occupation. He had always been well until October of 1888, when he fell a distance of fifteen feet, striking upon a plank, and producing a fracture of the spine in the lower dorsal region. At this time he was almost completely paralyzed below the fracture, with retention of urine. The sensation was normal, until two days after the accident, when it entirely disappeared from the whole left leg to above the hip, and the next day the right foot was somewhat numb. The sensation returned in a few days, except upon the left side, particularly about the hip. After the accident he was in bed for eight months, and then was allowed to be about on crutches.

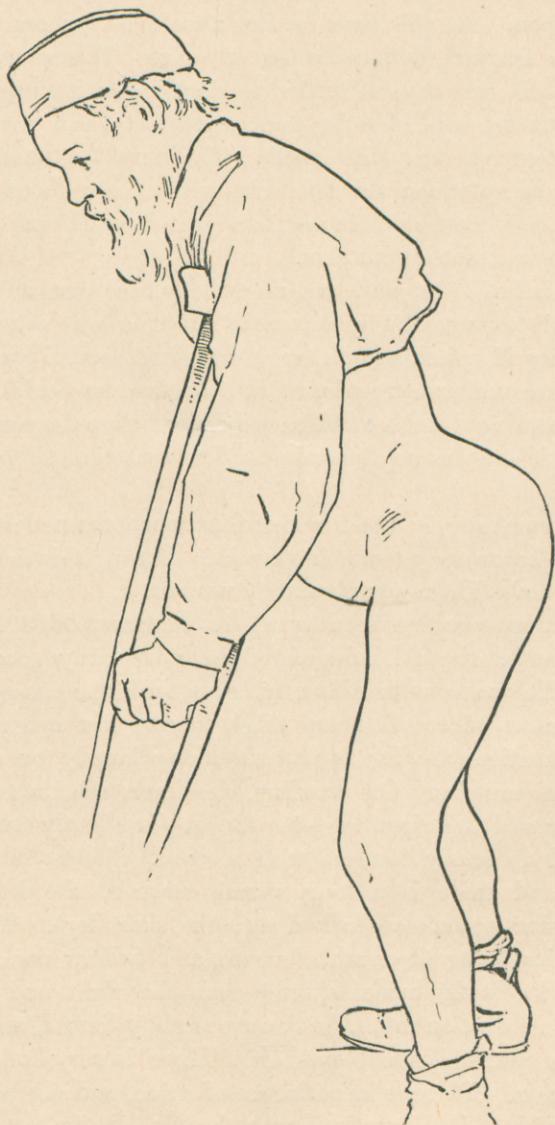
In the fall of 1890, while walking, the left leg gave way, and he was unable to bear his weight upon it. He was taken to the Boston City Hospital, and although examined several times under ether, by the various surgeons, no sign of fracture could be made out, and nothing definite could be determined as to the condition of the hip. There was no shortening. The sensation in the leg was impaired.

After remaining in bed for about three months he left the hospital, and began to use crutches again. During this time his leg grew shorter. There was absolutely no pain.

The patient was first seen by me in February of 1891, and he then presented the following condition: In fairly good general health. He walks with difficulty, even with the use of a cane. The extensors of the foot and thigh having lost much of their normal function, the leg is thrown along largely by the psoas and iliacus muscles. On standing, the knees are braced against each other and the right leg—the longer—is slightly flexed. He is obliged to steady himself with a cane. There is moderate lordosis, and there is a long spinal curve to the left in the dorso-lumbar region (evidently due to the short leg). There is a kyphosis involving the tenth, eleventh, and twelfth dorsal spines. The left leg is  $2\frac{3}{4}$  inches shorter than the right, and is  $\frac{1}{2}$  inch smaller. Abduction and adduction are slightly limited, and inward rotation is restricted about one-half. There is very little up-and-down motion. There is incontinence of urine, and the bowels are very sluggish. The knee-jerk upon the left side is lost, while it

is normal upon the right. There is no ankle clonus, and the pupillary reflexes are normal. There is a deep circular ulcer in

FIG. 2.



the centre of the right heel about the size of a nickel, with sharp edges.

Since the first examination, one and a quarter years ago, there has been very little change in his condition, except that by the use of a swathe about the hips, and a high sole on the short leg, he is able to walk a little better. A similar ulcer to the one upon the right side has formed upon the left heel.

The exact etiology of these cases is by no means settled, different writers having decidedly different opinions, and some even deny the existence of such a disease. To quote from Howard Marsh : "This affection of the joints, both in its symptoms and its morbid anatomy, bears, as already said, so close a resemblance to osteoarthritis that many observers maintain that they are one and the same disease."

To discuss the pros and cons of this question would take far too much time, nor do I think it necessary, as I feel sure that you all agree that the disease under consideration has a clinical history and a morbid anatomy which is peculiar to itself.

That which is considered to be the common cause of such joint lesions, *i. e.*, tabes dorsalis, is undoubtedly present in the first case ; the shooting pains, the Argyle-Robertson pupil, the unsteady gait, and absent knee reflexes all point to locomotor ataxia.

The second case, having for its cause a fracture of the spine, is, so far as I am aware, the first case that is recorded, with this etiology. Just what the nature of the injury to the cord was, is, of course, uncertain. It is probable, however, that it was either torn across, or that it was bruised and pressed upon enough to cause the paraplegia. The sensory nerves were not affected until the second day, when the sensation disappeared from the left leg—the same side on which the joint disease occurred. Furthermore, the sensation was never wholly restored, showing that there must have been some permanent injury to these fibres. It is reasonable to suppose that the trophic nerves were injured at the same time.

Other causes are mentioned by various writers until nearly all of the diseases of the spinal cord are included. Sir James Paget<sup>1</sup>

<sup>1</sup> Clinical Soc. Trans., vol. xviii. p. 69.

cautiously considers the disease due to an admixture of several morbid conditions, notably gout, rheumatism, and syphilis. Billroth<sup>1</sup> thinks the conditions always due to hereditary syphilis. Strümpell<sup>2</sup> considers the condition not wholly "nervous trophic," but partly due to traumatism to the joint. Vigues and Joffroy mention an acute form occurring in Pott's disease. Michaud<sup>3</sup> reports the same condition. Gull has seen it in idiopathic myelitis. Ross<sup>4</sup> adds progressive muscular atrophy and disseminated sclerosis, as well as hemiplegia. Lovett<sup>5</sup> mentions syringo-myelia. In fact, any disease which produces an atrophy of the large ganglion cells of the anterior cornua of the cord is supposed to predispose to this joint disorganization. It must be admitted, however, to offset this opinion that Joffroy has examined three cases, and Coyne one, in which no such atrophy was present, which helps to support Buzzard's theory that the disease is wholly due to some lesion in the medulla.

Pathologically these two cases are of interest in a negative way by showing so little before the joint was destroyed. The bony thickening and induration, which is spoken of as being seen in the beginning of the disease, was not present. The first case was examined carefully at the time the right hip gave out, and there was little, if any, bony thickening to be made out on that side; while the other hip, which three months later became destroyed, appeared at that time as a normal joint.

In the second case, when first examined, there was no thickening to be made out, and it is only recently, or over a year from the time of the joint disorganization, that it has been marked. This is contrary to what has been written upon the subject, from which we are led to expect bony overgrowths and marked trochanteric thickening very early in the disease, a condition that is directly opposite to that which was present in these cases. This point seems to me to have some importance, especially in the differential diagnosis between spinal arthropathy and ordinary osteo-arthritis, in

<sup>1</sup> Lect. XL., Surg. Path.

<sup>2</sup> Text-book on Med.

<sup>3</sup> Sur la Méningite et la Myélite dans le Mal. Vertébral, p. 54.

<sup>4</sup> Diseases of the Nervous System, vol. i. p. 223.

<sup>5</sup> Diseases of the Hip, p. 168.

which latter disease one finds this thickening early, and the joint destruction, which is less liable to occur, as a later symptom.

There is, of course, an acute form of spinal arthropathy, which is seen in pressure myelitis, from Pott's disease, or idiopathic myelitis, in which the pathology is different. In this there is considerable pain, with tumefaction and joint effusion. It is apt to go on to suppuration, and presents an entirely different condition for prognosis as well as for treatment, from the chronic form which is more often seen.

An early diagnosis must be difficult at all times. The course of the disease is so insidious that it is not, as a rule, until the bones have become displaced that the trouble is noticed. This is very well shown in the first case, where the patient was under careful observation for six months before the left hip slipped out, without the suspicion of trouble being present. It would have been more easy to have predicted some joint trouble in the second case, from the undoubted injury of the nerves or nerve cells having to do with sensation and motion of the affected leg, but which joint would be attacked could have been nothing more than guesswork. The absence of pain, or at least the slight character of it, makes it easy to understand why the patient's attention is not attracted to the joint until some obstacle to locomotion is offered. Even at this time the diagnosis may be troublesome, the condition being most often confounded with a simple dislocation or a fracture at the neck of the femur. The absence of pain, however, together with the absence of muscular spasm, the characteristic dry rub, or grate on motion, and the presence of some spinal disease should make the diagnosis clear.

The treatment should, of course, aim first at controlling the disease in the cord, whether in the acute or chronic forms. If the acute type with joint effusion, rest in bed, with extension to prevent dislocation, and incision of the abscess, if one forms, is briefly all that is required.

In the chronic form, after the joint has been destroyed, the treatment is at best unsatisfactory, and to make locomotion as easy as possible is the aim. Excision is advised with the disease located in the knee, but it is obvious that this would be useless with the same condition at the hip. One of my cases has been helped a great

deal in walking by wearing a belt fastened tightly about the hips. It seems to steady him and give the muscles something to work against. Massage, of course, is of value to keep up the nutrition of the muscles, and possibly electricity would be of benefit.

In the way of direct medication, both of the cases were improved by taking nux vomica for a considerable length of time. Otherwise, drugs have had no effect.



