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Syphilis of the Vertebral Column: Its Symptomatology and Neural Complications

BY

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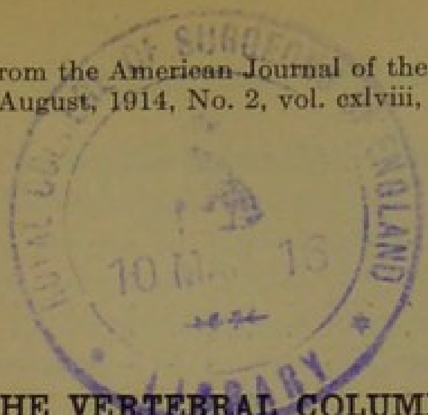

SYPHILIS OF THE VERTEBRAL COLUMN: ITS SYMPTOMATOLOGY AND NEURAL COMPLICATIONS.[1]

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Introductory Remarks. Syphilis is recognized as a fairly frequent occurrence in certain portions of the skeleton, more especially of the tibia, clavicle, and skull. All authorities agree that involvement of the spinal column is very rare, and some writers even regard its occurrence in the dorsal and lumbar regions as somewhat doubtful. This spirit of skepticism is probably due to the fact that many of the cases formerly recorded as syphilitic were really tubercular in nature, and many such errors of interpretation are to be found in the earlier literature. In the past few years, interest in this question has been revived, and the condition while unquestionably more frequent than is generally held, is nevertheless a comparatively rare affection.

At the present time, there are about one hundred well-authenticated cases recorded in literature, from which may be obtained a fair idea of its frequency, localization, and symptomatology.

The first statistics on this subject were published by Neumann in 1904, giving an analysis of 55 cases. The vertebral localization was as follows:

Cervical region	36 cases
Dorsal region	9 "
Lumbar region	8 "
Sacral region	2 "

Of the cervical group, in all but 8 cases, the disease was localized in the four upper vertebræ, a majority of these involving the axis and atlas.

Petren, in 1909, again analyzed the existing cases, and in his series the same frequency of involvement in the cervical region is shown:

Cervical region	42 cases
Dorsal region	6 "
Lumbar region	4 "
Sacral region	3 "

[1] Presented at the meeting of the American Neurological Association, June, 1912.

Ziesche, in 1911, collected 88 cases, distributed as follows:

Cervical region	61 cases
Dorsal region	12 "
Lumbar region	5 "
Sacral region	2 "
Cervical and dorsal region	1 "
Dorsolumbar region	3 "
Diffuse	4 "

In this series the number of vertebræ affected in a given case was also tabulated, which shows a decided tendency to limitation of the process within a circumscribed area.

NUMBER OF VERTEBRÆ INVOLVED.

1 vertebra in	25 cases
2 vertebræ in	17 "
3 vertebræ in	11 "
4 vertebræ in	3 "
Diffused in	4 "

Cases of syphilitic disease of the spine have also been recorded by Fry and Sachs in this country, which with 4 personal observations and those of Oppenheim not included in the previous statistics, bring the total number of available cases up to 100.

The great frequency of the cervical localization has been noted by all writers on this subject. Gerhardt has suggested that this frequency may be due to the proximity of this region to the bones of the skull, and as a consequence the extension of the disease downward. Another potent factor has been the secondary involvement of the upper cervical vertebræ by direct extension from pharyngeal ulcerations and gummata. This is especially true of the older cases, in which sequestra and fragments of necrosed bone having this origin were not infrequently expelled through the mouth. Neumann regarded the extension from pharyngeal ulcerations as the chief cause of cervical involvement in the majority of cases.

That the dorsal region may also be the seat of the lesion is shown conclusively by one of Oppenheim's cases, with involvement of the eleventh and twelfth dorsal vertebræ and spinal-cord complications, as well as a more recent observation by Preiser. In Case IV of my series there was syphilitic osteitis of the lower lumbar vertebræ and sacrum, confirmed by pathological examination.

The x-rays will probably play an important role in the future diagnosis of this disease. In one of Petren's cases the diagnosis was confirmed by this means, and Sachs has emphasized the importance of this method.

In two of my cases with severe vertebral symptoms, no bone lesions could be demonstrated in the radiogram, and the bone involvement was evidently more in the nature of a periostitis

(perispondylitis). In another, however, definite lesions, exostoses with thickening of bone tissue, were found.

The pathological lesions in the vertebral cases are the same as are found elsewhere when the skeleton is involved, and consist of exostoses, gummatous periostitis, and osteomyelitis, with occasional necrosis and sequestration of bone. The tendency to pus formation is slight, and "cold abscesses" as found in tubercular caries apparently do not occur.

It is evidently rare for the spine to be affected in the second stage of syphilis, the greater number originating in the tertiary period. Petren has described a case occurring in an infant with secondary lesions. Neumann maintains that hereditary lues may be localized in the spine, and records four cases between the ages of four and eleven years.

The *symptomatology* of syphilitic spondylitis does not differ essentially from that accompanying other affections of the spine, and consist essentially of pain, tenderness, rigidity, and deformity. In some cases, more especially in the cervical region, firm, nodular swellings may be palpated (exostoses). Tenderness appears to be more marked than is usual in tubercular spondylitis, and the nocturnal osteocopic pains are particularly persistent and distressing.

In cervical involvement it has been remarked by Petren and also by Ziesché that rotation of the head is more restricted than flexion; the reverse was true in one of my cases.

One of the most interesting questions of symptomatology is the frequency and nature of neural complications resulting from invasion or compression of the spinal cord and nerve roots. Of the 100 cases which I analyzed, neural symptoms were present in 26, distributed as follows:

Cervical region	15 cases
Dorsal region	5 "
Lumbar region	4 "
Sacral region	2 "

It is to be remarked that neural symptoms are increasingly more frequent in the recent reports, doubtless due to the more technical methods of the present day, which serve to detect the milder grades of pressure both of the cord and nerve roots.

The neurological examinations in this series of cases are by no means complete, so that a detailed analysis is impossible, but a general idea may be obtained of the nature and extent of the injuries sustained by the neural structures.

Of the 26 cases with neural complications, 14 were associated with symptoms that would indicate a lesion of the spinal cord, corresponding to the level of the bone disease, a "compression myelitis," in the sense in which this term is used in caries.

In 9 cases the limitation of symptoms to paralysis and pares-

thesia of one upper or lower extremity indicated a radicular origin. Such an involvement of the roots or plexus producing monoplegia alone must be a rare occurrence in Pott's disease, and when it is present should arouse the suspicion of syphilis.

In 2 cases of sacral origin the symptoms indicated an involvement of the strands of the cauda equina.

An unusual complication occurred in Case III of my series, a cervical spondylitis, with symptoms indicating a lesion of the medulla oblongata, possibly from involvement of the vertebral artery as it courses through the transverse processes in the neck.

Of special interest is the occurrence of root pains, paresthesia, and localized paralysis of an extremity corresponding to the region involved. This group of cases is particularly frequent in the cervical region, and may simulate pachymeningitis cervicalis hypertrophica. Sachs especially has emphasized this resemblance, and advocates the *x*-rays as an important means of differentiation.

Similar cases are also met with in the lumbar region, and may be unilateral or bilateral in distribution, due to involvement of the nerve roots or adjacent plexus.

It is interesting to note in passing that parasyphilis may also be complicated with syphilitic spondylitis (Hallopeau and Sachs).

Of special complications which may occur the most noteworthy is ulceration of the pharynx which was observed in 16 cases of the cervical localization (Neumann), and which gave rise in 9 cases to extrusion of fragments of necrosed and carious bone. Sudden death has occurred from erosion of the vertebral artery (Mackenzie), and once from ulceration and rupture of the internal carotid (Landrieux).

In common with diseases of the upper cervical vertebræ, the odontoid process may undergo spontaneous fracture with compression of the cord.

REPORT OF CASES.

CASE I.—*Syphilis of the skull (exostoses) and knee-joint, and syphilitic laryngitis preceded the development of vertebral symptoms; these came on suddenly in the upper cervical region, simulating rheumatic myositis; x-ray examination was negative; girdle pains around the base of the neck and lancinating pains in the distribution of the occipital nerves were the only nerve complications; gradual subsidence of pain under antisyphilitic treatment; rigidity persisted for some months, but gradually disappeared with complete restoration of functions.*

History. The patient, a man, aged forty-three years, an expert accountant by occupation, was referred to me on April 7, 1910, by Dr. Frank W. Murray, for severe headache which had persisted for over a year. He had pneumonia at the age of seventeen years

and typhoid fever at thirty-two years, following which there was slight deafness with occasional tinnitus in the right ear. He is moderate in the use of alcohol, and denied emphatically any venereal disease. One brother died of tuberculosis, but this is the only occurrence in the family history worthy of special mention.

In January, 1909, he had a throat trouble, accompanied by huskiness of voice, which was diagnosed as a possible tubercular lesion of the larynx. His family physician, however, suspected syphilis, and under moderate doses of potassium iodide all symptoms disappeared. Coincident with the laryngitis there developed frontal and temporal headaches, which were always most severe at night, and these have continued with occasional remissions up to the present time. Because of the nocturnal character of the pain it was his custom to sleep during the day, as sleep at night was impossible, owing to the intense pain. He had noticed that while taking the potassium iodide the headaches seemed less intense, but this treatment had been intermittent, and the drug had never been taken continuously or in large doses. After a time three small round prominences appeared on the left frontal bone (exostoses). He stated that in the autumn of 1908 he had had pain and swelling of the left knee-joint, which gradually subsided. At the present time the knee-joint is swollen, and there is a slight effusion in the joint; there is also a very tender point over the patella. He has never had any vomiting or vertigo with the headaches, which were distinctly nocturnal and osteoscopic in character. There were no other cerebral or nervous symptoms present.

Status Præsens. April 7, 1910. The pupils are equal and react promptly. No tremors. Skin and deep reflexes are normal, as as are the cranial nerves. The deafness on the right side is of the middle-ear type. Optic disks are normal. Urine is normal. Examination of the viscera proved negative. The Noguchi test of the blood gave a positive reaction. Corresponding to the site of one of the small projections of bone noted by the patient in the left frontal region a small depression in the skull can now be palpated. Clinically the case is clearly one of bone syphilis involving the cranium and the articulation of the left knee-joint. He was placed upon ascending doses of iodides, with hypodermic injections of the salicylate of mercury.

May 12. Under mixed treatment the headaches promptly ceased; the swelling of the knee-joint subsided, but has not entirely disappeared, and he still has occasional pains in the joint.

June 30. There is still slight swelling and some tenderness of the knee-joint. No cranial pain.

August 1. Owing to intestinal symptoms, the iodides and mercury were omitted.

September 1. Pains in the knee and skull have entirely disappeared. Wassermann reaction was strongly positive. He was

told that he unquestionably had syphilis, and should undergo a prolonged and systematic course of treatment. He did not take this advice seriously, and did not return until January 21, 1911, when he appeared with a puffy edema over the right eye, which had developed suddenly and under which the bone was tender to pressure. There was little or no spontaneous pain. He had had no antisyphilitic treatment since the previous July.

The swelling subsided rapidly under antisyphilitic treatment, after which he did not return until October 12, 1911. At this time he complained of no symptoms, and the Wassermann reaction was negative.

October 16, 1911. He returned with a painful and stiff neck of three days' duration, which had appeared suddenly after sitting in the open air for two hours in a strong wind, watching a base-ball game. He had with it a sore throat and a general feeling of having taken cold. In view of the negative Wassermann reaction on October 12, and a very clear history of exposure to cold with sore throat, he was placed upon antirheumatic treatment, although with the previous history the possibility of lues was held in reserve. As little or no improvement followed the usual local and general treatment for rheumatic myositis, he was again placed upon antisyphilitic treatment.

November 1. At this time the movements of the neck were restricted in all directions, and caused considerable pain (see Fig. 1). There was distinct tenderness over the second and third cervical vertebræ, also on deep pressure on both sides of the spinous processes. Opening the mouth caused sudden pains in the occiput. There has also developed a tender and painful spot over the right parietal bone. Sharp, shooting pains are felt in the course of both occipital nerves. He also complained of a tight band-like drawing sensation around the sides and base of the neck (neck girdle). Swallowing caused painful sensations in the lower occipital region. Pain is much worse at night, coming on about five o'clock in the afternoon. In the morning he is fairly comfortable.

November 11. Movements of the neck are a little less restricted. The second cervical segment is still tender on pressure. Girdle sensation is also present about the root of the neck, and jarring of the spine causes shooting pains in the right occiput and auricular region. The painful spot over the parietal bone is still tender.

x-ray examination by Dr. L. G. Cole, who reports as follows: "Structure and contour of the bones of the head and neck show distinctly. Bodies of vertebra and intervertebral foramina are quite distinct. In the lateral direction the bodies of the third, fourth, and fifth vertebræ are normal in size, shape, and alignment. There is an unusual space between the anterior ring of the first vertebra and the body of the second vertebra, and the relation of the odontoid process to the anterior ring of the first cervical vertebra

is altered. In addition there is a spur on the upper surface of the ring which forms the partial foramen through which the first nerve emerges from the spine. This spur is to be regarded as an anomaly. Otherwise the examination is negative. I am unable to detect any change in the structure of these bones which would indicate that it is of syphilitic or tubercular origin.

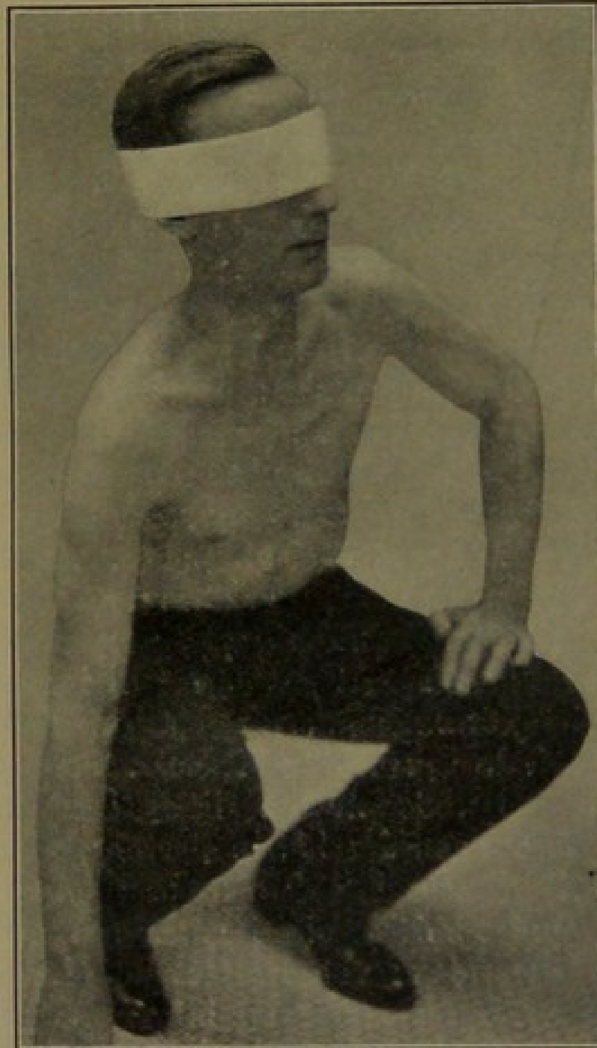

FIG. 1.—Syphilitic spondylitis of cervical region. Case I. Patient picking up an object on the floor, showing marked rigidity of the neck and fixation of the head.

November 17. He is generally free from pain in the early part of the day, but it returns about four or five o'clock in the afternoon. It is burning and throbbing in character. The neck is much more flexible, especially backward and forward. It is, however, held stiffly. Tenderness of the second and third cervical vertebræ has practically disappeared. Jarring of the spine causes shooting pains over the mastoid on both sides.

January 19, 1912. A second x-ray examination was made by Dr. E. W. Caldwell, who reports as follows: "I made a number of x-ray plates showing the lower six cervical vertebræ very well. I do not find any indication of the cause of his symptoms, in this part of the column, but I suspect that the trouble is in the articu-

lation between the axis and the atlas, the shadow of which is obscured by the shadow of the skull. The limited rotation in this joint makes it practically impossible to secure an x-ray shadow of it which is not obscured by superimposed shadows of the other bones."

March 5. Neck is still stiff, but has steadily improved. The lateral movement is more restricted toward the right. There is still some deep-seated tenderness over the second and third cervical spines.

Remarks. Under the continuation of antiluetic treatment, pain and tenderness entirely disappeared. For some months the movements of the neck were restricted, especially flexion and extension, but after a course of osteopathic treatment (taken on his own initiative) this rigidity entirely disappeared. He is still unwilling to believe that the disease is syphilis, and now that he is well he is averse to taking further precaution or treatment.

The onset of vertebral symptoms in this case had been preceded during the previous three years by a train of symptoms clearly indicating syphilitic involvement of the cranial bones, the knee-joint, and the larynx. All of these various manifestations subsided under antiluetic measures. While a specific infection was denied, the Wassermann was positive. From these clinical facts there can be no question as to the syphilitic nature of the subsequent symptoms in the cervical region. The process was apparently localized in the upper three cervical vertebræ, judging from the local tenderness, which was quite marked, and the root pains and girdle sensations of the neck which corresponded to these levels. There were no symptoms pointing to involvement of the spinal cord.

One of the interesting features of the case was the sudden onset following exposure to cold, so that the clinical picture closely resembled rheumatic torticollis. The subsequent course served to demonstrat its true syphilitic nature.

Two examinations were made by the x-rays, both of which failed to reveal any lesions of the bone tissue.

I have, therefore, regarded the process as being in the nature of a syphilitic periostitis or perispondylitis, with compression of the adjacent nerve roots. The pain on pressure and jarring of the spine, the local tenderness and rigidity, were so characteristic of vertebral disease as to rule out a syphilitic pachymeningitis with root involvement.

Case II.—*Syphilitic periostitis or perispondylitis of the cervical region, with pain and rigidity of the neck, motor and sensory disturbances of the right upper extremity, distinct tenderness and thickening in the lateral region of the cervical column.*

History. Patient is an Italian, aged twenty-seven years; a barber by occupation. He was admitted to the New York Hospital,

August 14, 1907, where I saw him on several occasions in consultation with Dr. Conner, the attending physician.

Previous History. In 1898 he contracted a venereal ulcer, for which he received only local treatment. No secondaries were noted by the patient. He remained in good general health until March, 1902, when headaches appeared. At first in the left frontal region, later becoming general. They were quite severe, with marked nocturnal exacerbations. He was admitted to the New York Hospital, March 22, 1902. Physical examination is negative, except for a double optic neuritis. The diagnosis of cerebral syphilis was made, and all symptoms cleared up rapidly after a course of mercury and iodides.

On December 1, 1903, he was readmitted to the New York Hospital with headaches of one month's duration, situated chiefly on the right side of the head in the temporal region. The headaches were quite severe. There were distinct nocturnal exacerbations, with tenderness on pressure over the right parietal bone, but no bony nodules could be felt. He also had some pain in the anterior aspect of the left thigh and of the left leg. There was no vertigo, vomiting, or diplopia. The optic disks were normal. The general physical examination was negative, save for some secondary anemia (hemoglobin, 60 per cent.). After a short course of antisyphilitic treatment the symptoms completely disappeared and the patient was discharged. A clinical diagnosis of cerebral syphilis was made.

Present Illness. Patient was re-admitted to the New York Hospital August 14, 1907, with the following history: For the past seven months he has had pains in the back and sides of the neck and in the left shoulder, gradually becoming more severe. For three months he had been unable to work. The left elbow is slightly swollen and tender and is the seat of occasional spontaneous pain. He also has headaches, and because of the nocturnal increase of the pain, sleep has been almost impossible for many weeks. For the past five days, he has had severe pains in the region of the right shoulder, and has developed a weakness, with paresthesia of the right upper extremity. The neck is also stiff, and the movements are painful. There is no vertigo, vomiting, nor diplopia; no vesical trouble.

Physical Examination. The gait and station are normal, except for an evident stiffness of the neck and fixation of the head. The movements of the neck are restricted in all directions, and cause considerable pain. The cervical spine is quite tender to pressure on both sides, especially on the right. The spinus processes, however, are not tender on percussion. Jarring of the spine causes pain, which is referred to the cervical region. The movements of the dorsal and lumbar spine are free and painless. The pupils are equal and react to light and accommodation. There are no cranial

nerve palsies or nystagmus, and the optic disks are normal. There is considerable weakness of the right upper extremity, and especially in the movements of abduction and elevation of the arm. Sensations to touch, pain, and temperature are diminished over the whole of the right upper extremity. There is marked tenderness along the lateral portion of the cervical spine where the nerves emerge from the intervertebral foramen, but especially on the right side. Palpation also shows some general thickening and enlargement in this region of the spine. Both shoulder-joints are freely movable and painless. The left elbow-joint is freely movable, but is slightly swollen and tender. There are no tender spots on the skull. All tendon and skin reflexes are present and normal. There is plantar flexion of the toes on both sides (no Babinski). Examination of the heart, lung, and urine are negative. The blood shows slight secondary anemia (hemoglobin, 84 per cent.). The x-ray examination of the cervical spine was entirely negative. The temperature curve showed a slight elevation for the first few days, after which it remained normal. Wassermann reaction was positive.

Subsequent Course. The patient was placed upon antisyphilitic treatment, hypodermics of salicylate of mercury, and ascending doses of potassium iodide. There was a rapid subsidence of all symptoms.

August 27. The pains had diminished, and the movements and sensation of the right upper extremity were normal. Some stiffness of the cervical spine, with pain and tenderness, still persisted.

September 14. Pain had practically disappeared. Can now move the head in all directions, but the movements are still somewhat restricted, and there is still present some lateral thickening in the cervical region, which is tender to pressure.

Patient was referred to the out-patient department for further treatment, and eventually made a complete recovery.

Remarks. The vertebral symptoms in this case had been preceded by two previous attacks, diagnosed as cerebral lues, both of which cleared up completely under antisyphilitic treatment. The vertebral symptoms came on gradually, and were of seven months' duration, and were limited to the cervical region. There was in addition to rigidity and pain on jarring in the cervical region, marked tenderness along the lateral aspect of the vertebræ where the nerve roots emerge. This was especially localized upon the right side, where a distinct thickening and enlargement was palpable. The neural symptoms made their appearance about six months after the onset of the vertebral disease, and were evidently of root or plexus origin. They consisted of weakness, with objective sensory disturbances in the right upper extremity. There were no evidences of spinal-cord involvement. All symptoms subsided under specific treatment.

CASE III.—*Syphilitic spondylitis of the upper cervical region; sudden onset, with pain and rigidity in August,* 1907; *improvement under specific treatment; frequent recurrences of pain and stiffness from lack of continuous treatment; in December,* 1910, *development of acute symptoms with vomiting, vertigo, and headache, followed by numbness and weakness on the right side, and an atrophic paralysis of the left side of the tongue (hemiplegia alternans); improvement under antisyphilitic treatment; in November,* 1911, *there was still rigidity, with thickening and enlargement in the cervical region, and the residual symptoms of hemiplegia alternans.*

History. The patient, a negro, aged thirty-seven years; occupation, bellboy; was admitted to the Vanderbilt Clinic, department of nervous diseases, on November 18, 1911. He is married and has one child, aged six years, living and well. His wife has never miscarried.

Six years ago (1905) he contracted syphilis; no general treatment. In August, 1907, he was seized suddenly with pain in the occipital region and in the nape and sides of the neck, which was followed by rigidity and stiffness of all the movements of the head. At the medical clinic where he applied for treatment the case was first regarded as rheumatic myositis, but because of the previous specific infection, he was later treated with iodide of potassium and mercury. The pain rapidly subsided and the rigidity was greatly diminished. Following this improvement, he failed to return for further treatment, although some stiffness of the neck still persisted, and from time to time he had pain in the cervical region. When the pain was severe, he would return for medicine, and after taking the iodides for a short time, the pain ceasing, he would abandon the treatment. When the pain was severe, the neck seemed to be swollen and slightly enlarged in the painful areas.

In November, 1909, he suddenly developed cerebral symptoms; frequent attacks of vomiting, with headache and vertigo. The vomiting was severe and of the cerebral type, and had persisted for two weeks before he was admitted to Roosevelt Hospital, on November 24, 1909. These general cerebral symptoms were soon followed by weakness and paresthesia of the right arm and leg and some thickness of speech, due to a paralysis and atrophy of the left side of the tongue (hemiplegia alternans). The heart and lungs and urine were reported negative in the hospital history. The Wassermann reaction was negative on December 17, 1909. There was rigidity, with moderate thickening and tenderness, along the lateral aspect of the cervical region of the spine. The general cerebral symptoms cleared up promptly under antiluetic treatment. The patient was discharged with the symptoms of hemiplegia alternans persisting. There was still some stiffness of the neck and an occasional pain, especially at night.

November 18, 1911. Patient returned to the Vanderbilt Clinic, complaining of pain and stiffness in the cervical region, and was

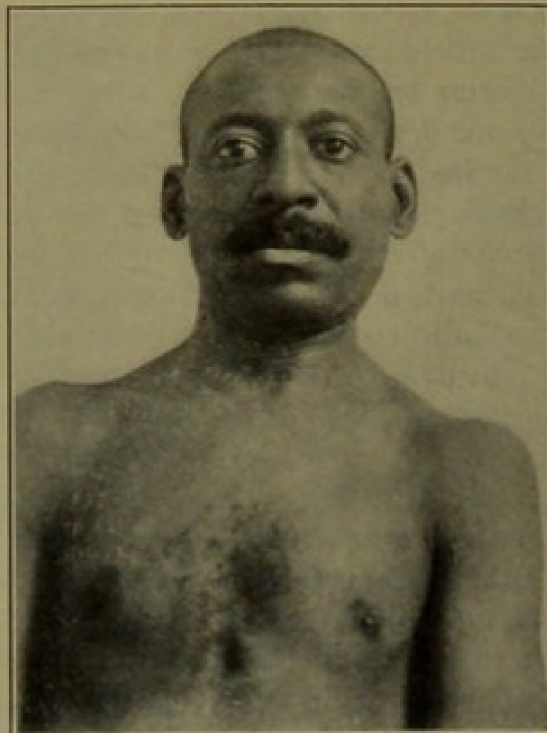

Fig. 2.—Case III. Old syphilitic spondylitis of the cervical region, showing rigidity of neck and slight torticollis position of the head.

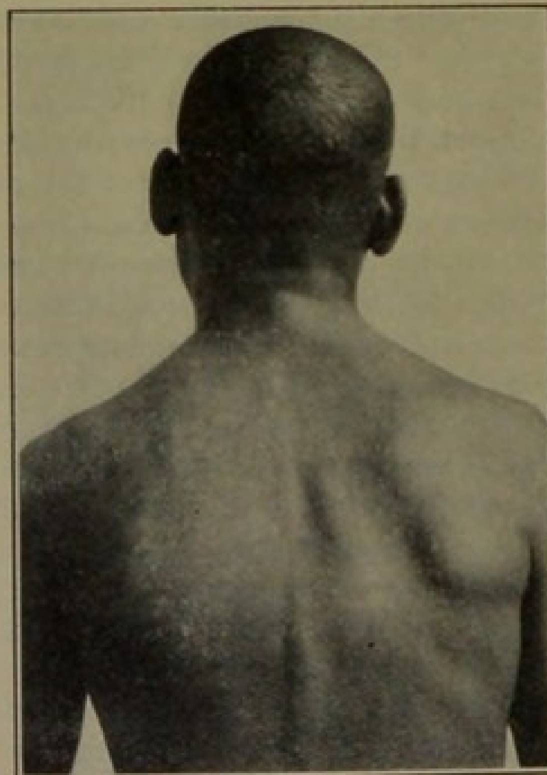

Fig. 3.—Case III. Syphilitic spondylitis of cervical region, posterior view.

referred to the Neurological Clinic, where he came under my observation.

Physical Examination. The head is in a slightly torticollis position, the chin directed toward the left (see Figs. 2 and 3). All movements—rotation, flexion, and extension—are restricted. Jarring of the spine causes pain in the upper cervical region (first, second, and third cervical). There is some thickening in the region of the lateral processes on both sides of the neck, especially on the right. There is a slight compensatory lateral curvature of the spine. Pupils are equal and react normally. Ocular excursions are normal except for a slight lateral nystagmus. Vision and the sense of smell are normal, as are the fifth and seventh nerves. There is diminished hearing on the right side (central deafness). The soft palate is equally enervated on the two sides. The tongue deviates sharply toward the left. There is a very pronounced atrophy, with deep furrows and marked fibrillation of the left side of the tongue. There is also some atrophy, with fibrillary twitchings on the right side as well, but to a lesser degree. There is no difficulty in deglutition, and the voice is normal. No laryngoscopic examination. The sternocleidomastoid and trapezius are normal on the two sides. The right arm and leg show some weakness, more especially the leg. The tendon reflexes of the right lower extremity are exaggerated, and there is ankle-clonus. No patellar clonus. The plantar reflex on the right side is diminished, and is of the flexor type. It is normal on left. The abdominal and cremasteric reflexes are diminished on the right side. The superficial sensibility is lost over the right lower extremity and over the lower half of the right side of the trunk; above this the sensibility is simply diminished. The sensibility of the face is normal. The deep sensibility of the upper and lower extremities is normal.

The man was placed upon anti-syphilitic treatment and the pain and stiffness in the neck rapidly improved. As was always the case in this particular patient, as soon as the pain ceased he lost interest in the treatment and ceased to continue it. There is, however, no question as to the rapid response at all times to anti-syphilitic treatment, especially the iodides.

An *x*-ray examination at the Roosevelt Hospital showed thickening and enlargement of the bodies of the third, fourth, and fifth cervical vertebræ, as well as of certain of the lateral processes, especially on the right side. There were no evidences of destruction or cavity formation of the vertebræ or intervertebral disks.

Remarks. The syphilitic spondylitis in this case had run a very gradual course, extending over a period of four years. The chronicity of the symptoms and the permanency of the rigidity may be referred to the intermittent and incomplete manner in which the antisyphilitic treatment was carried out. This never failed, however, to produce subsidence of pain and diminution of rigidity.

An interesting and unusual feature is the occurrence of hemiplegia alternans, a unilateral atrophic paralysis of the tongue with contralateral hemiplegia, due to a lesion in the lower portion of the medulla oblongata on the left side. It is possible that this lesion of the medulla may have been caused by syphilitic disease of the vertebral artery as it coursed through the transverse process. Cerebral lues independent of the vertebral disease cannot, however, be excluded.

CASE IV.—*Syphilitic osteitis of the lower lumbar vertebra and sacrum, with gummatous infiltrations of the cauda equina, followed by paralysis and sensory disturbances, in the distribution of both sciatic nerves, and accompanied by marked rigidity, deformity, and tenderness of the lumbosacral spine; autopsy revealed syphilitic osteitis of the lower lumbar vertebra and sacrum, with multiple gummata of the cauda equina.*

History. Patient, a man, aged fifty-three years, was admitted to the Montefiore Home for Chronic Invalids, January 5, 1896. He denies all venereal disease, and enjoyed excellent health up to one year ago, when he developed pains in the distribution of the right sciatic nerve, which were especially severe at night. There was some tingling and numbness on the outer side of the right leg. A little later similar pains and paresthesia developed in the same distribution on the left side. He also had severe pain in the lower portion of the back over the sacrolumbar region, especially in the sitting posture, so that he was obliged to use a cushion to protect this region from pressure. Pain was particularly severe in the sitting or recumbent posture, and he would experience a little relief in standing and in walking. The pain became gradually more severe, and he was obliged to resort to narcotics and analgesics for relief.

On October 7, 1895, he was admitted to Mt. Sinai Hospital, and while there developed extensive paralyses of the lower extremities, with incontinence of urine and feces.

On his admission to the Montefiore Home, he complained of shooting pains in both lower extremities and severe pain in the lower portion of the spine, especially in the sitting and recumbent posture; incontinence of urine and feces and impotency.

Status Præsens (Dr. Joseph Fraenkel). Patient is unable to walk because of weakness in the lower extremities. On attempting to stand he complains of pain in the lower portion of the spine, and sudden pains in the feet and legs. There is a constant dribbling of urine. Pupils are small and equal; reaction to light slight; reactions on accommodation are present. Ocular excursions are normal. Motility, coördination, muscle volume, and sensibility of the upper extremities are normal. There is a well-marked kyphoscoliosis at the junction of the dorsolumbar region, the scoliosis being the more marked deformity. The spine is tender on pressure,

beginning at the first dorsal vertebra and extending to the coccyx. This sensitiveness is especially marked over the eleventh and twelfth dorsal and the first lumbar vertebra and over the lower portion of the sacrum. It is acute on percussion. Over the lower portion of the sacrum there is a slight tumefaction. The movements of the column show great rigidity, and are accompanied by considerable pain. There is no visible atrophy nor fibrillation of the muscles of the back. There is some weakness of the abdominal muscles in their lower portion. Both lower extremities are paretic, more especially the left. The calves of both legs are markedly atrophic. The knee-jerk is lively on the right side, with patellar clonus; absent on the left. Both ankle-jerks are absent. The abdominal, cremaster, and plantar reflexes are absent on both sides.

Sensation. There is tactile and thermal anesthesia in the distribution of both sciatic nerves. Sensibility to pain is diminished in the same area. There is also anesthesia of the left buttock, left side of the scrotum, and penis and perianal region. The deep sensibility of the toes is disturbed. Heart and lungs are normal.

Death occurred February 28, 1896. Postmortem examination showed extensive syphilitic osteitis of the lower lumbar vertebra and the upper portion of the sacrum. There was a good-sized erosion of the first sacral segment. The strands of the cauda equina were matted together by extensive syphilitic infiltrations, and contained four gummata the size of hazelnuts. The histological examination of sacral segment and cauda equina present the typical lesions of syphilis.

Remarks. This case is interesting because of its unusual localization, syphilis of the lumbar region being the rarest of all types. Cases of syphilitic caries of the sacrum have been described by Yvaren and by Westphal. In Westphal's case it was associated with typical sacral anesthesia.

Concluding Remarks. Syphilitic spondylitis and perispondylitis while rare are nevertheless sufficiently frequent to be given careful consideration in every case of acute or chronic vertebral disease. The onset may be sudden, simulating an acute rheumatic affection, or it may develop gradually and run an exceedingly chronic and protracted course.

Localization in the cervical region, especially, should awaken the suspicion of lues, as more than half of the recorded cases are of this region. It may, however, occur in any portion of the spinal column.

Of 100 cases available for analysis, I found that 25 per cent. were associated with some complication referable to the nervous system. These were either of the nerve roots and plexus or of the spinal cord itself.

Generally speaking, in this group of cases with neural complications, the symptoms indicated a lesion of the spinal cord in two-

thirds; in the remaining third, the neural symptoms were limited to an involvement of the nerve roots or plexus.

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