

**The diagnosis of Pott's disease of the spine before the stage of deformity /  
by V.P. Gibney.**

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Gibney, V. P. 1847-1927.  
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**Publication/Creation**

Cambridge : Printed at the Riverside Press, 1882.

**Persistent URL**

<https://wellcomecollection.org/works/g6b9nfpn>

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THE DIAGNOSIS  
OF  
POTT'S DISEASE OF THE SPINE

BEFORE THE STAGE OF DEFORMITY.

BY  
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[*Reprinted from the Boston Medical and Surgical Journal.*]

CAMBRIDGE:  
Printed at the Riverside Press.  
1882.



THE DIAGNOSIS OF  
POTT'S DISEASE OF THE SPINE  
BEFORE THE STAGE OF DEFORMITY.<sup>1</sup>

ONE hundred and ninety-six cases of Pott's disease of the spine came under treatment in the out-door department of the hospital during the year ending December 31, 1881, and of this number only *fourteen* came without any angular deformity. Six of this number were cases wherein the cervical region was alone involved, the remaining eight being equally distributed between the dorsal and the lumbar regions. We have, then, one hundred and eighty-two new cases of angular deformity from this disease in a single year.

This is my apology for the paper, and the present seems a fitting time to talk plainly and to urge upon the general practitioner, be he physician or surgeon, be he specialist or not, the vast importance of making a diagnosis early and before the mother or the nurse calls attention to the significant knuckle. It requires no professional skill to diagnosticate the disease then. The drift of teaching, I fear, within the past seven years, has been rather toward treatment than toward diagnosis. The cry has been for therapeutics, and the cry has been heard.

Many a case of rickets and of simple antero-posterior curvature from anæmia has been encased in plaster-of-Paris from lack of proper diagnosis, and yet caution forbids us condemning the practice. If the treat-

<sup>1</sup> Read by title at the meeting of the New York State Medical Society, 1882.



ment will prevent deformity it is better to err on the safe side. It is an outrage on Science, however, to report such simple cases as Pott's disease and as cured by this or that plan of treatment.

A friend, whose teachings I value very highly, is reported to me as declaring in his lectures that the physician who cannot diagnosticate vertebral caries before the stage of deformity has no right to practice medicine. That professor is not an orthopædic surgeon either. I am not as yet prepared to adopt that speech as my own. There is much teaching on this subject that is actually vicious, but some signs formerly laid down as pathognomonic are not any longer urged as of any practical importance. I speak more particularly of tenderness on pressure over or percussion of the spinous processes. Nothing is to be gained by this procedure, and a persistence in it often irritates the little patient to such an extent that a good examination is rendered practically impossible.

It may be laid down as a rule, with barely enough exceptions to prove the rule, that tenderness on pressure either with the hand or with the hot sponge is never present in the early stages of a vertebral osteitis. So that in searching for an incipient caries let no reliance be placed on such a fallacy. I have in mind now a patient who did present tenderness early, but this was a female child, and it is not at all unlikely that this was but the sign of a hysterical spine complicating the bone disease. Pressure over the spine posteriorly ought rather to relieve than cause pain where the bodies of the vertebræ are enlarged by recent inflammatory changes. The patient naturally carries himself in lordosis and that which aids this position gives relief. A weak or soft spot (apparently soft) is sometimes found by firm pressure along the spinous processes in rachitic children. Within the past three months two very intelligent families from different parts of the country have brought their children for mechanical treatment, and after an exceedingly tedious



examination I failed to find any spinal disease. The parents came, it is true, without any letter or card from the physician in attendance, but were very positive in stating that he had discovered a weak, or soft, spot (pointing to a spinous process in the dorsal region), and had urged them to take the child without delay to the city for a brace.

Another test, very popular and constantly employed, I want to raise my voice against, for the reason that the abuse is so easy and the use even is unsatisfactory. It is the forcible pressure with the hand or blows with the same on the top of the head or shoulders in the long axis of the body. If the upper dorsal or the cervical region be affected this is actually dangerous, and it is not only true of recent cases but all the more true of cases that have been under treatment for a time. The expedient is resorted to then to ascertain whether or not a cure has been established.

A few months ago I was on a visit to a friend in a neighboring town, and the mother of a patient little girl, terribly deformed, was my hostess, and while discussing that topic, ever supreme in her mind, she said, "Dr. Gibney, I don't know now, with all my fund of experience, to whom I should go if my little girl were just beginning her sufferings." And she had had a varied experience in therapeutics, for her wealth had commanded distinguished talent.

The history she gave me was that when her daughter, now fourteen years of age, was only four she began to manifest signs of weariness on slight exercise, would seek various attitudes which would rest the spine, in fact, presented symptoms that persisted until nearly three months had elapsed, when a small "knuckle" was observed between the shoulders. An orthopædic surgeon was consulted, and he took the case immediately under treatment. For one year his skill and his assiduity were all that the most exacting parent could demand. His aim was to arrest the disease, and to prevent any further deformity, and his aim was cer-



tainly unerring. After a year's treatment he allowed the little patient to stand on her feet, removed the apparatus, and, in the presence of one or two members of the family, placed his hands on the child's head, firmly pressing downward. He was no feeble specimen of a man, and the weight upon that tiny head was more than it could bear. The patient winced under this crucial test, the limbs trembled all that day, and a restless night followed. Pain was felt in the back of the neck, and along the spine, and in remote parts of the body. Several days of irritation followed, the "knuckle" began to increase in size forthwith; the doctor was greatly annoyed that the case should act in this way, his interest seemed to wane, and in three months another specialist was consulted, under whose mechanical treatment the child became paraplegic. He, skilled as he was, got the credit of producing the paralysis, and other advice was sought. For several years the loss of power continued, the deformity grew into an *immense boss*, and finally, on the return of power, abscesses made their appearance.

Now, I have not pictured this case to censure any one; I have simply narrated it to serve as a warning. It made a profound impression on me, for I had so often seen that "pressure test" employed, and in my earlier experience had practiced it myself. It is refreshing to read the remarks made by Mr. Howard Marsh in the *British Medical Journal* for June 11, 1881, concerning these same dangerous experiments. His paper is full of valuable instructions, and I cannot too strongly urge its close study.

The truth is that the nearer one comes to a knowledge of the pathology of the disease now under discussion the more easily can a diagnosis be made, and the more rational will be the interpretation of the symptoms. As Mr. Marsh says, we do not want to talk about *angular curvature*, or curvature of the spine. The term *spondylitis*, which some of my friends are attempting to introduce, is a confusing one to the stu-



dent in pathology. That term was first employed, and is now employed, to designate a kind of arthritis deformans, the lesion being a rheumatic form of inflammation affecting the lateral masses and spinous processes, and never the bodies of the vertebræ. It is characterized by increase rather than by destruction of tissue. Julius Braun published, in Hanover, in 1875, a monograph on this affection as one of the most frequent causes of manifold neuroses, especially spinal irritation. He published fifty-eight cases, and drew a sharp distinction between this and spondylarthrocace (spinal caries). In spondylitis we get very marked spinal tenderness.

If we understand that a very large proportion of all the cases of Pott's disease, especially in children, begin as a central ostitis of one or more of the bodies of the vertebræ, and understand that this ostitis is attended with swelling in the early stages, we can then understand the mechanical effect on nerves passing through the foramina of exit when any concussion or contortion by accident occurs.

There are certain general questions to be settled in examining a case, and the first and most important is *the duration of the symptoms*. If we find the patient has been suffering vague and irregular neuroses for a fortnight or longer without any complete cessation of the same, we must know next *the behavior of the child at play or when getting into and out of bed*. If a slight strain or jar occur while the little one is at play this will be followed by an oral expression of pain, and relief will be sought in that position which will give rest to the spine. The mother, if you give her an opportunity, will tell you of many attitudes intuitively assumed. You need to know then *how the sleeping hours are passed*, and if you learn that instead of sharp screams without waking (so peculiar in hip disease) a moaning or restlessness with little cries on turning have been observed, then let the patient be stripped naked, and while this is being done the time can be



spent profitably in getting the family history. I do not mean the reply to the questions, "Are you healthy?" and "Is your husband healthy?" You waste valuable time in propounding such questions. Ascertain all that there is to learn about transmissible diseases in both members of the family by direct and cross examination. A knowledge of facts need not bias your judgment. Learn also the personal history of the patient. If any cholera infantum followed by a slow recuperation, if rickets with its significant malnutrition, if malarial fever, if the more prominent of the exanthemata, such as scarlatina or diphtheria, if *whooping-cough* with tardy convalescence, — if any of these diseases, I say, come to your knowledge in getting the personal history (and it is the safer to ask about them all), you will be about ready to give an opinion. I say *about ready*, because if you have obtained any facts leading you to recognize an acquired or hereditary diathesis, you will already have observed the movements of the child as it moves over the floor. You will also have already heard about a fall or injury, the knowledge of which came second-hand to the mother after she began to observe the very first symptoms of disability. Of course you will investigate the reported injury, and while I am as willing as any one to give a fall all the credit it deserves in the ætiology of joint diseases, I must insist on getting facts with regard to falls even.

One among the first things to observe is how the patient walks, whether the spine is carried stiffly, and whether it appear shifted to one or the other side of the pelvis. You will then observe the stooping, whether the spine be held erect, or nearly so, while the thighs and legs, by sharp flexion alone, execute the act. And do you know there are some children who wear one's patience out before you can get them to stoop? — You sometimes have to lay them down forcibly. They will surely not remain on the floor, and you can get much information by watching them roll



over and get upon their feet again. You will see the child often, while standing, place the hand on one or the other thigh for the "collateral transmission" of weight. The functions of both hips should be carefully examined, the pelvis should be explored by palpation and percussion as well as the ilio-costal spaces. So much for the general examination of a case for Pott's disease before the stage of deformity. A few details now regarding the different regions.

#### I. THE CERVICAL AND CERVICO-DORSAL.

One among the earliest symptoms observable in patients who are developing disease in the bodies of the cervical or upper dorsal vertebræ is a slight torticollis or a modified opisthotonos. The child early shows a disinclination to hold the head erect or to do anything which requires rotation of this member. If any object excites the interest the whole body will turn in getting a view. Often the opisthotonos will be apparent rather than real. The head will be held in this position to prevent the chin falling toward the sternum. Besides it calls other muscles into play in giving support. This can be easily excluded from true torticollis. In the one passive movements of the head are resisted and are painful, all the muscles coming to the rescue to prevent any motion that may aggravate the sensitive nerves; in the other there is no pain unless you make traction on the shortened or contracted muscles. The muscle will usually stand out in bold relief, and there is an element of rotation here not present in the other case.

The facial expression — that of pain and extreme caution in movement — is very significant. The gait is likewise peculiar, the steps being short and cautiously taken, and then there is the compensating backward curve in the dorso-lumbar region which often misleads one into regarding this as the affected locality. This position of the shoulders, shrugged as it were, the head seeming to sink down into them, is significant.



The little hands can often be seen grasping the chin or the side of the head so as to support it as steadily as possible. These signs and these manœuvres once seen will not be forgotten. There will be a history of pain, usually, in the prone position, the mother will tell how sensitive the head is, will tell how much pain and distress follows the slightest cough. Indeed, occipital neuralgia will almost always be present if the first or second cervical vertebræ are at all affected either primarily or secondarily, for the sub-occipital and the great occipital nerves emerge in this region. Mr. Marsh makes a very good point when he observes that in other regions of the spine pain, when it is present, is felt either at the affected part or below it and is very rarely situated at a higher level. Irregular action of the diaphragm will materially assist in making a topographical diagnosis, for the fourth and fifth cervical pairs must necessarily be implicated by reason of the pressure from inflammatory products.

The ordinary temporary deformities of the head and neck from cold sometimes puzzle one in making a differential diagnosis, but in these we have exaggerated deformities with histories of a brief duration. An examination of the tonsils and pharynx is always necessary, and in children it is often very difficult to satisfactorily explore these parts; yet the presence of hard or soft tumors along the post-pharyngeal walls can easily be recognized by the finger. If any doubt exists this exploration should not be neglected. An abscess in this region will sometimes produce the most alarming laryngeal spasm.

The symptoms already detailed apply more particularly to the disease as it affects infants and children. In adults we can get better examinations, we can ascertain more definitely the location of pain. Furthermore, caries of the cervical spine in adults usually follows some severe traumatism, as a fracture or a subluxation, for instance.



## II. THE DORSAL VERTEBRÆ.

When the ostitis is confined to this region, the head symptoms already described are wanting and the pain is referred to parts on a level with or below the vertebræ involved. For instance, in the upper dorsal the intercostal muscles are impaired in function and the respiration is generally abdominal. Lower in the column we have abdominal pains and a fondness, very marked, for the prone position. This is sought by day over the mother's knees, over a chair, or on the floor; and by night this position is naturally assumed. To differentiate from the pains due to intestinal disorder, such as the presence of worms in the alimentary canal, or to malarial poisoning, is often difficult, that is, if one do not always examine a case thoroughly. It is well known to the practitioner who lives in malarial localities that "pain in the stomach" is one of the most constant symptoms in children suffering from this poison. I well know that a single examination will not always enable one to pronounce positively in a given case; but I do know that we have a specific that will enable one to eliminate malarial poisoning, and the reason why many cases of dorsal caries are not recognized in their incipency is not because the attending physician lacks skill but because he fails to apply that skill. He feels so confident that the case is malarial that he prescribes without a physical examination, without even an inspection, and with the full assurance that he is correct he does not examine the case again. He does not know, perhaps, that chronic bone diseases are notably diseases of exacerbations. I care not how great a man may be, how vast his experience may have been, the necessity still exists for a careful examination of all children who have abdominal pains with or without remissions.

The spine will present, instead of a projection backward or a fullness even, rather an incurvation — a lordosis; and this, taken in connection with the duration



of the symptoms, the detailed history, the rigidity with which the column is held, the peculiarity in walking and in stooping, will enable one to make at least a provisional diagnosis of vertebral ostitis and give the patient the benefit of precautionary treatment.

One cannot always rely on failing health as a symptom, for there are many cases of unmistakable bone disease in fat, hearty-looking children. The plan of making extension with the child lying prone across the examiner's lap, and then reversing this, so often practiced and recommended by some good teachers in orthopædic surgery, does not meet my hearty approval. I resort to it by way of routine, but I must confess I have never been able to extract much information therefrom. As above remarked, the way in which the patient gets up from any decubitus is very significant, and the face will tell where the disease is located.

In the lower dorsal tumors in either ilio-costal space often present before any bony deformity can be recognized, and we must bear in mind that a perinephritic abscess will give rise to the same sign. In the former, however, we can generally get a history of chronicity, while in the latter the symptoms will be of short duration and have a sudden onset. In adult life we have strains and rheumatism from which to differentiate, and I do not know of any infallible signs by which one can always be guided. Let the functions of the spine be thoroughly examined, and if possible get a history. Without this latter it is frequently impossible to reach a conclusion at a single visit. In all cases, however, in which a reasonable doubt exists let the patient have treatment, pending your decision, for Pott's disease.

### III. THE LUMBAR VERTEBRÆ.

When this region is affected the first sign to which the attention is directed is a lameness or a stiffness in one or the other limb. For a long while the patient will favor one side, at first almost imperceptibly, then there will be remissions apparently, and later marked



flexion of the thigh. The physician when consulted does not get pains at the knee and does not get any tenderness at the hip-joint. He gets good flexion and good rotation and good abduction. He rarely thinks to explore the pelvis, and the patient is dismissed as suffering from rheumatism or "growing pains." By and by a tumor presents in the groin or in Scarpa's space, and even then the spinal lesion goes often unrecognized. Femoral hernia is diagnosticated, hip disease with peculiar symptoms is thought of, idiopathic psoas abscess and simple cellulitis. The hand is occasionally passed up the spine, no deformity is felt, and caries is excluded.

Let it be distinctly understood that a soft tumor in the groin or Scarpa's space especially, preceded by lameness extending over one or many weeks, unaccompanied by constitutional disturbance, hectic for instance, unassociated with stiffness at the hip-joint, — smoothness of joint-surfaces, free flexion and free abduction, — and without a history of direct injury to groin or of intestinal symptoms, points to disease in the bodies of the last dorsal or some of the lumbar vertebræ. And this is as true of adults as of children. An idiopathic psoitis is one of the rarest of diseases; an articular ostitis of the hip will extend over many months and will make itself known long before abscess appears. Hernia can be recognized or excluded by an ordinarily careful examination.

To make a differential diagnosis between lumbar caries and perinephritis is frequently attended with considerable difficulty, especially if the perinephritis present an element of chronicity. As a rule, however, perinephritis in children is acute and is primary. In adults it is secondary to a pyonephrosis, and an examination of the urine will assist materially in arriving at a diagnosis. In Pott's disease there is always the element of chronicity. The spine in perinephritis is flexible, and one has no difficulty in thoroughly testing its functions, unless, perhaps, the patient be naturally cross



and unmanageable. The writer has often directed attention to the points in differential diagnosis in papers on perinephritis, and for a detailed account of the same he would refer the reader to the *American Journal of Obstetrics*, April, 1876, to the *American Journal of the Medical Sciences*, April, 1877, and to the *Chicago Medical Journal*, June, 1880.

The same difficulties arise in differentiating from iliac abscess or perityphlitis. It will be necessary simply to bear in mind these different affections and to remember that they occur with perhaps more frequency than text-books allow. In the *American Journal of the Medical Sciences* for January, 1881, I have reported six cases of perityphlitis as it occurs in children, and the points of resemblance are referred to at length.

It is not scientific, however, to wait for the tumor to appear above the surface. If flexion of the thigh occurs we should make palpation over the iliac region, and the presence of a tumor deep in the iliac fossa can be readily perceived. The general symptoms of bone disease will present here as in other regions.

A word now with reference to the occurrence of spinal caries in subjects suffering from caries in the neighborhood of other joints, more particularly the ankle and the knee joints. Time and again I have overlooked a spinal disease because my attention was devoted to a caries of the ankle or an articular osteitis of the knee. The lesson I have learned is to examine, if possible, the whole body in all cases of knee and ankle joint disease that present, especially if the patient present evidences of greatly impaired nutrition. My friend, Dr. T. E. Satterthwaite, called attention to this coincidence of diseases in his report to the Therapeutical Society on Suppurative Disease of the Ankle in Children and Young Adults, published in the *Medical Record*, August 21, 1880.

In conclusion, let me urge upon the profession the possibility of making a diagnosis of vertebral caries before the stage of deformity is reached, the duty of



making the diagnosis, — a duty now all but imperative, — and the facility with which it can be done, irrespective of the region affected, if the physician cultivate a habit of submitting every case of disease in children, wherein the least element of chronicity enters, to a thorough physical examination.

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## CLINICAL SUPPLEMENT.

THIS paper is a supplement to the foregoing, is made up of cases completed, and is intended to illustrate many of the points upon which I dwelt in that communication. The illustrations will of course be clinical, and I have had considerable difficulty in selecting from the rich storehouse of recorded material our hospital affords such cases as will meet the requirements of a practical article.

In recording errors of my own making, as well as those my confrères have made, I but emphasize the value of diagnosis much more forcibly than if I recorded case after case wherein our skill had enabled us in every instance to arrive at a correct diagnosis. In medicine, as in the sporting field, there are very few men who can hit the mark every time. Long and constant practice does not make perfect, in the true sense of the term, but simply approximates perfection. I do not believe that there is any man, be his specialty what it may, who does not meet with cases and examine them over and over again, only to confess his ignorance as to the lesion. Such cases make the science of medicine attractive. They stimulate study. The two following have been to me extremely interesting, and because a solution has not been reached in my own mind I hesitated to publish them, yet they so well illustrate the remarks I have just made, that I decide to submit them as "a study."



CASE I. FIRST DIAGNOSIS, A STRAIN; FIVE MONTHS LATER, A SUBACUTE DORSO-LUMBAR MENINGITIS, OR NEUROSIS OF THE HIP; TWO YEARS LATER, IDIOPATHIC ILIAC ABSCESS; A MONTH LATER, LUMBAR CARIES WITH PSOAS ABSCESS; AT PRESENT WRITING “(?)”

Grace H., aged eight, came under observation in the out-door department of the hospital October 7, 1879. She was disinclined to bend the dorso-lumbar spine either in stooping or walking, and referred what pain she had to this region. There was no angular deformity of the spinal column, and, indeed, no exaggeration in any of the normal curves. She had no abdominal pain, and none in the distribution of the lumbo-sacral nerves. Her rest at night was broken by the pains above mentioned. Three weeks ago, while sound in health and limb, she fell backward from a chair, and the mother could not find any bruise. Pain was felt in the spine, yet she continued at school for a week. It was considered a mere spinal strain, but as a precaution we applied a brace.

October 27th. Is doing well; there is no deformity; she walks naturally, yet does not want to leave off the apparatus.

January 10, 1880. No sign or symptom of disease, and the brace is removed tentatively for two weeks.

January 24th. Since last visit the pain and stiffness have returned, and yesterday she lay down all day. There is no kyphosis and no tenderness, but the brace is reapplied.

February 2d. Comes this morning with slight limp, left side, and refers pain to her hip while she has no pain at the knee. Blister ordered to dorso-lumbar spine.

February 21st. Entirely relieved; no pain, no lameness, no spinal stiffness.

May 22d. Nothing whatever save an occasional lumbar pain and a scalding sensation on micturition. An alkaline diuretic ordered.



February 4, 1882. First visit since April 11, 1881, at which time she was considered cured. Comes now because she favors the left thigh in walking, and on examination there is found marked tumefaction in left iliac fossa, but no other evidence of spinal caries. A liniment and roller ordered.

February 25th. Walks with heel squarely on the floor and she is relieved.

March 18th. There seems to be an unmistakable caries of last dorsal and first lumbar vertebræ, as concussion gives pain, and the tumor in iliac fossa is increasing. Yet there is no deformity of spine; a brace is ordered, and on the 25th is applied. Within a few days the signs have disappeared — all save the tumor — and this is smaller. What is the lesion?

CASE II. DIAGNOSIS, FIRST VISIT, HIP-DISEASE (?);  
AT FIFTH VISIT, A MONTH AFTERWARDS, CARIES  
OF THE LUMBAR WITH PSOAS ABSCESS; NO SIGNS  
OF ANY DISEASE AT THE END OF A YEAR.

Cornelius K., aged three, was examined rather hastily in the out-door department, February 11, 1881. The hour was late, and all we learned was that the boy had been walking lame for three weeks, and had complained during that time of pain in his limb. The movements at the left hip could not be made with ease, and the diagnosis was recorded "left hip-disease (?)," and the mother was instructed to bring him again on the 14th, which she did, and it was further learned that he was stiff in the morning, but had had no pain night or day since her visit on the 11th. The hip movements were limited only in extension, and there seemed to be a little atrophy of the limb. A spika bandage was applied, and the patient was ordered to be brought on the 17th. Nothing further was elicited on that date, although he was submitted to a very careful examination. On the 23d nothing conclusive could be found, and on the 28th I felt pretty sure that I found a little deep-seated induration in the iliac fossa



but its existence could not be demonstrated, so exceedingly cross was the child. March 12th he walked like one with spinal disease, favoring too the left side; he stooped, however, quite naturally, and sitting, standing, or lying, no prominence or other deformity of the spine could be detected, except an almost inappreciable lordosis. There was no tenderness on concussion, and the lateral movements were good. The iliac tumor was now easily mapped out and was the size of a hen's egg. On the 26th there was no change, and the diagnosis was given as vertebral disease with psoas abscess, a spinal brace being applied. The patient was examined a week or two later with but confirmatory results, and then we lost sight of him until April 1, 1882, when the mother brought him to the office by request. The spinal brace had been removed six months ago, as she saw no further necessity for its use. There is now no sign of spinal caries, and no tumefaction of any kind can be found in the iliac fossa. He walks without any lameness, and the functions of the joint seem perfect. He is fat and hearty. The only thing which suggests itself now as the lesion from which he suffered a year ago is idiopathic psoriasis terminating in resolution.

That one may see how insidiously a spinal caries may go through all its stages even, and be recognized only after a spontaneous cure has taken place, the following is presented.

CASE III. OLD DORSO-LUMBAR CRIES WITH PROJECTION OF ONE AND A QUARTER INCHES FROM THE VERTICAL AXIS; CICATRIX OF ABSCESS; COMES ON ACCOUNT OF A LATERAL CURVATURE WHICH IS COMPENSATORY; NEVER ANY TREATMENT, AND NEVER ANY DIAGNOSIS (?).

Katie O'C., aged seventeen, applied at the hospital August 23, 1879, for the relief of a lateral curvature of the spine which was most marked in the dorso-lumbar region and to the left, there being very little



rotation of the bodies present. There is found an angular deformity in this region, the projection backwards being one and a quarter inches, and ankylosis seems to be well established. The remaining portion of the column is normal in function, she can stoop with ease, is in excellent health, and never has any pain. There is the cicatrix of an abscess in right loin. No one looking at her as she is dressed would ever suspect that there was any deformity. The history as given by the mother is, that two years ago or more there was observed a certain degree of stiffness as the girl would attempt to stoop, in fact she stooped without bending the back at all. There was very little pain, and the parents, regarding this as a "foolish habit" into which the daughter was falling, made her "bend the spine like anybody else." After a while an abscess appeared under the floating ribs on the right side, pursued the usual course, and finally healed. It is reported that the discharge of matter was very profuse, and that the patient had a little fever. The disease went as it came. We kept her under observation for a while to satisfy ourselves that a cure had really taken place, and she then ceased reporting.

#### I. THE CERVICAL AND CERVICO-DORSAL VERTEBRÆ.

##### CASE IV. DIAGNOSIS OF CERVICAL POTTS' WITH AN " (?) "; CURE IN SIXTEEN DAYS; DEVELOPMENT OF FURUNCULI AND CASE BECOMES CLEAR.

On the 4th of August, 1881, my friend, Dr. Holt, referred to me Martin F., aged four, from the children's department of the Bellevue Dispensary. The doctor, like myself, thought the boy should have the benefit of any doubts that might exist concerning vertebral disease, because he had had scarlatina about two months previously, and during convalescence began to complain of pain in the neck, and to carry the head in torticollis, which deformity had been increasing; because, furthermore, he had not rested well nights, and had complained of cervical and post-occipital pain if



the head were moved. On my day record I noted, caries of the cervical vertebræ (?), although I could not detect any deformity in spinous processes or lateral masses unless I flexed the head forward toward sternum. I was further induced to believe in a probable caries because I knew that the exanthemata very often induce a cachexia which is peculiarly fertile for the development of bone diseases. A spinal brace with head-spring was ordered for the 16th, on which date the apparatus was applied, the boy having been kept at rest in the mean while. By the 20th his deformity had disappeared, the functions of the head were normal, and there was a crop of furunculi in the post-cervical region. Fears were abandoned, the brace was removed, and the syrup of the iodide of iron, in ten-drop doses three times a day, ordered. The patient was seen on the 27th and on September 5th, the notes on which dates are unnecessary as the boy was doing well.

October 5th. Since the date of last note a large furuncle has formed and opened over the spinous processes, and the cicatrix remains. Discharged cured.

CASE V. CERVICAL CARIES NOT DISCOVERED UNTIL  
A POST-PHARYNGEAL ABSCESS GAVE ALARMING  
SYMPTOMS; DIPHTHERIA SUSPECTED AND TRACHE-  
OTOMY SUGGESTED.

Joseph O'C., aged four years, was brought to the hospital March 30, 1878, by the mother, in great alarm. She brought also a letter from a medical friend of mine asking an opinion. When he had been first called to the child the distress was so great that he fancied he had a case of diphtheritic croup, and began to prepare for tracheotomy, but on closer examination the case appeared more like one of post-pharyngeal abscess, and he sent it forthwith to me for consultation. The little patient was breathing stertorously, had a high temperature, and had been in much distress for twenty-four hours. The head was held in slight



rotary torticollis, and the mother told me that this deformity had existed for "some time." I had great difficulty in getting an examination of the pharynx. The left tonsil was much enlarged, and was covered with a whitish, glairy mucus, not unlike a diphtheritic membrane, but back of the tonsil I could see the outlines of a tumor. The spine was held stiffly, and there was a shade of fullness in the spinous processes. I sent the patient direct to the doctor's office with advice to incise the abscess, which he did that very morning, getting a large quantity of pus. The relief, he wrote me, was immediate, and on the 10th of April I applied a head-spring. The vertebral caries was soon fully established, and on October 19th I detected an abscess in the right cervical triangle, and opened it on December 30th. The further history is interesting but not pertinent. March 7, 1881, the case was discharged cured.

CASE VI. A CERVICAL NEUROSIS, PROBABLY MENINGEAL, FIRST DIAGNOSTICATED AS VERTEBRAL CARIES; PROMPT RELIEF, AND RETURN OF SYMPTOMS FIVE YEARS LATER; RELIEF AGAIN.

Joseph C, aged twelve, was brought to the out-door department August 24, 1881, and the following notes were made in the daily record: Torticollis quite marked; rotation of head to the left, the mental process of the inferior maxilla being three inches from the acromion process of the scapula. Passive movements are resisted, and are very painful; there is decided tenderness on pressure over the spinous processes of the cervical vertebræ, but there is no deformity in this region. The family history is reported as good on both sides; there are eight children living, and all are in good health; two died in early infancy. The mother reports that he was under treatment at this institution four years ago, and on referring to the records we find that he was examined for the identical set of symptoms on the 25th of August, 1876, that a diagnosis of



cervical caries was made, that a brace and head-spring were applied on the 29th, that he reported on September 12th and October 3d of same year, and was not seen again. She states now that the apparatus was removed on the last date, and that the case was discharged cured. He continued without an untoward symptom until four days ago, August 20th, when he became drowsy, and next day came in with his head distorted, and complaining of pains in his neck and back. He also had headache and cramps in hands and legs, attended with marked numbness. He has been gradually growing worse. Caries is excluded on the present occasion, and the lesion is thought to be a meningeal hyperæmia. A fly-blister is ordered, and on the 31st it is recorded that he has obtained very little relief. The blister, however, was not applied where ordered, and another is to be applied. Admission to the hospital is also advised. September 10th is admitted, but an examination is not made until the evening of the 12th, when we have difficulty in recognizing any deformity. He executes all the movements of the head easily, and there is no spinal tenderness or deformity. In fact the patient is cured! He was retained in hospital until the 23d, during which interval not a sign of relapse could be seen. The diagnosis recorded on the 12th was: torticollis due to perispondylitis cervicalis rheumatica.

On reflection it seems now that his symptoms may be explained in one of two ways. There may have been a meningeal hyperæmia due to rheumatic influences or to malarial poisoning (the boy has always lived on Staten Island, where malaria is said to prevail in protean types); again, it may have been a lesion affecting the ligamentous structures about the foramina of exit for the cervical nerves, and the nature of the lesion may have been either rheumatic or malarial.



## II. THE DORSAL VERTEBRÆ.

CASE VII. A NEUROSIS DIAGNOSTICATED AT FIRST;  
PROVED TO BE DORSAL CARIES A MONTH LATER;  
SPINAL TENDERNESS AND MALARIAL HISTORY.

Flora D., aged six, an anæmic child, came under observation in the out-door department February 14, 1881. She complained much of pain in the back, was at times stiff in her gait, and there was on this date very marked spinal tenderness in dorso-lumbar region and over sacrum. The joint movements were all free and painless, and there was no tenderness on concussion. A full history was not obtained, as the patient came in late. A diagnosis of spinal neurosis was made, and a blister ordered.

February 23d. No tenderness now on direct pressure, but if pressure be made on the head in the long axis of the body the girl complains of pain in the lumbar region. A tonic ordered, and patient to report in a week for further observation.

March 14th. Dr. Knight sees the case to-day, and diagnosticates incipient caries of the spine; a brace is accordingly ordered, and applied a few days later.

September 27th. There is an angular deformity at junction of mid and lower dorsal region, the height of which is three eighths of an inch. She complains of pain in the back, and the brace is out of repair, so a new one is ordered.

December 29th. There is a clear history of malarial poisoning; periodical headaches; chilly sensations, etc., etc. (Patient lives in Greenpoint, Long Island.) Quinine, gr. vi. *per diem*, and to be increased.

February 23, 1882. The mother reports that the child was promptly relieved, and the medicine was shortly afterward discontinued.

March 13th. Periodic headaches again; quinine ordered, and relief soon afforded. The spinal deformity has not increased at present writing, and the disease seems arrested.



## CASE VIII. INTERCOSTAL NEURALGIA (?) WHICH PROVED TO BE SYMPTOMATIC OF AN UNRECOGNIZED VERTEBRAL CARIES.

Fred. C., aged thirty-two, applied June 22, 1881, near the end of the morning clinic, for relief of distressing pains, which he referred to the thoracic walls and hypogastrium. I made a hurried examination, finding a very tender dorsal spine, and tenderness over intercostal nerves. Fowler's solution and counter-irritation were ordered, and he was given explicit instructions to call in a few days for a more thorough examination. His first visit after the above date was on December 24, 1881, when he came walking into the office stooped over like an old man, and bearing the following note from my friend, Dr. Ripley: "Dear Doctor, You saw this man four months ago, *he says*. I should like your more mature opinion. Truly yours, J. H. R." It did n't require any mature opinion now for a diagnosis; the kyphosis spoke for itself. I learned from the man, though, that when he went home on the morning of June 22d his wife took charge of the case, and said he should n't take any "poison," and should n't have his back blistered, so he never came back for the examination I had requested; but when he began to suffer more, and to grow stooped, he went to his family physician, who sent him back to the hospital. His spinal tenderness on the first visit misled me, and this fact, taken in connection with the lack of time, prevented me from making an examination which would, without doubt, have led to a correct diagnosis. It is a noteworthy fact, however, that his pains have been in exacerbations, and that they usually follow exposure to wet and cold. He works in an engine round-house, and is much exposed to great changes of heat and cold, frequently getting his feet wet. I do not mean to intimate that the pains in joint disease do not, as a rule, come in exacerbations, but the above facts may help to account for tender points not only over the spine but along the dorsal nerves.



## CASE IX. SIMPLE ANTERO-POSTERIOR CURVATURE OF RACHITIC ORIGIN.

Jane H., aged twenty-two months, is but one of a large number of children brought to the hospital for spinal caries. This child is presented February 12, 1879. There is a marked exaggeration of the dorsal curve, and the child is unable, by reason of this malposition, to stand alone. The epiphyses of the long bones are enlarged, and the history is so clearly rachitic that we have no difficulty in making a diagnosis of rachitic kyphosis; besides, the curvature can be overcome by traction. A light steel brace is applied to overcome the deformity, and further treatment is constitutional. The progress was comparatively slow, and it was not until January 29, 1880, that all deformity had disappeared, and the child was walking freely. The apparatus was removed, and a careful examination failed to discover any signs of bone disease.

## CASE X. FIRST DIAGNOSIS, LATERAL CURVATURE FROM RACHITIS; ELEVEN MONTHS LATER SPINAL CARIES DETECTED.

Jas. C., aged four, was admitted to hospital July 24, 1874. He had a bad family history, and his personal history was wretched. The child had a chronic blepharo-adenitis with pannus, and it was not long since he had had the measles, with slow convalescence. During this convalescence he began to walk unsteadily. He stands with body shifted, as it were, over to the side of the pelvis, his abdomen is tympanitic, and there is no angular prominence or exaggeration of normal curves. An apparatus was applied, and constitutional treatment was faithfully carried out. The blepharo-adenitis gave much annoyance, and his improvement was often interrupted, so that by June 27, 1875, we had nothing specially encouraging to report. His lateral curvature had been overcome, but now he was observed to stoop very stiffly and with great effort;



there was marked lordosis and slight tenderness on concussion, the pain being referred to the dorso-lumbar region.

A diagnosis of vertebral caries was readily made, and a better-fitting brace applied. A mere "knuckle" finally appeared, and the correctness of the diagnosis was established beyond doubt.

### III. LUMBAR VERTEBRÆ.

#### CASE XI. LUMBAR CARIES DIAGNOSTICATED AS HIP DISEASE.

William W., aged five, seen in out-door department January 24, 1881, and examined by Dr. Geo. W. Ryan, of the house-staff. The doctor found a preternatural immobility of the spinal column, and a slight fullness rather than lordosis in lumbar region. He did not find any tenderness on pressure or concussion, but made a diagnosis of lumbar caries, and ordered a brace.

February 18th. Within a few days the little patient has walked lame, favoring the right limb. An elastic tumor, nearly as large as a hen's egg, is discovered deep in the right iliac fossa, and the lameness easily explained.

March 4th. Was taken to Bellevue Hospital about ten days ago, and one of the senior members of the house-staff examined him with much care. The father reports that the doctor said the boy had no spinal disease, but had hip disease, and advised admission to hospital. Another member of the staff, who was present on that occasion, gave me the same report. On examination to-day we find the hip movements smooth, and resistance only in extension. The father will not keep the apparatus applied as directed.

The spinal prominence on January 5, 1882, was one-half inch, and the psoas abscess was quite conspicuous.

CASE XII. is very like the one just reported. I had made a diagnosis of caries and had applied a brace, —



had also recognized a deep induration in iliac fossa. The boy walked lame, and the family physician, a man of much local prominence in a neighboring town, wrote me requesting that I examine closely for hip disease.

I did so at the doctor's request. The further development of the case abundantly sustained me in the diagnosis I had made.

CASE XIII. THE EFFECTS OF TRAUMATISM; SYMPTOMS RELIEVED BY COUNTER-IRRITATION; EXAMINED THREE YEARS AFTER CURE AND NO RELAPSE HAD OCCURRED.

Warren B., aged seven, came under observation January 4, 1877. He had fallen in September, 1876, striking his back against the edge of a stone and complained immediately of severe pain. After a few days the pain passed off, and he had no further trouble of any kind until the 9th ult., when, after a long walk, he experienced a marked weariness in his back, and this was followed by pain. On examination we found decided tenderness on pressure over the spinous processes, but none on concussion of the spine or on passive motion. His mother reports that when he was two years of age he had hip disease, and was cured by the weight and pulley in three months. No evidence about the hip can be discovered now of any such disease ever having existed. The diagnosis of the spinal lesion is caries of spine (?) incipient, and "probably not" was added. A fly blister was ordered, and at next visit a brace was applied by way of precaution.

March 14th. Not an untoward symptom since the first visit.

April 8th. Discharged cured.

April 24, 1880. Examined and found sound in body and limb. Has never had any signs of relapse.

CASE XIV. PERINEPHRITIS.

Jno. Jos. C., aged four and a half, was admitted to hospital July 15, 1880. The maternal family history



was phthisical. Five weeks ago the boy began to complain of his back, and to manifest a little stiffness on stooping. Two weeks ago he began to walk lame, and for the past five or six days the parents have observed a slight swelling in the right loin. He has been losing flesh. The spine is held rigidly as he walks, and he leans over toward the right side. There is no mobility in the spine as he attempts to stoop. Filling the right ilio-costal space and extending over the brim of the pelvis is an irregularly circumscribed swelling which gives deep fluctuation at one point, and is very tender to pressure. The thigh can be extended to nearly  $180^{\circ}$  without pain or resistance. It can be completely flexed, ab- and adducted, and rotated with very little effort. There is no induration in the iliac fossa, and the thighs are equal in size. A diagnosis of perinephritis is made, and August 5th the abscess is opened by incision. A tent was then inserted, and the boy was up next day.

August 16th. Sac pretty well collapsed, and the opening of the sinus has a pouting appearance so characteristic of bone disease. There was scarcely a trace of constitutional disturbance at any time, and on November 9th it is recorded that the sinus has closed.

November 19th. Functions of hip and spine normal, and the case is discharged cured.

In the former paper I had occasion to speak of an osteitis affecting the epiphyses of the long bones which often obscured Potts' disease in its incipency. In looking over our records for the past ten years, I find Potts' disease of the spine associated with disease of the joints more frequently than one would suppose; in fact, there are thirty-five cases distributed as follows:—

Vertebral caries associated with hip disease . . .	11
Vertebral caries associated with knee disease . . .	10
Vertebral caries associated with ankle disease . . .	10
Vertebral caries associated with ankle and hip disease . . .	1
Vertebral caries associated with shoulder disease . . .	1
Vertebral caries associated with knee and ankle disease . . .	2

A single case of multiple arthritis will serve to illustrate the obstacles in the way of making a diagnosis.



CASE XV. CARIES OF THE ANKLE; SYMPTOMS OF SPINAL CARIES TWELVE MONTHS AFTER INVASION OF ANKLE DISEASE; MALARIAL COMPLICATIONS MASKING THE SYMPTOMS OF BONE DISEASE; SYNOVITIS OF BOTH KNEES NINE MONTHS LATER.

Harold S., aged three, came under treatment as an out-patient, December 3, 1879, with a history of lameness dating from the preceding April. The only one of the exanthemata he had had was pertussis, and this was in June, 1878. He is the third of five children, the eldest being a mute, and all are delicate. The father is reported to be rheumatic, and the grandmother to have died of apoplexy. The maternal grandmother and an aunt died of consumption. The mother herself is aught but healthy. The patient lives in Jersey City. The infiltration about the ankle was well marked, and the joint movements were limited to very small arcs. He was put on the iodine treatment internally and externally, and a moderate amount of rest was enjoined. February 18, 1880, for symptoms of malarial poisoning, quinine was ordered, and he was soon relieved. He attended very irregularly during the next six months, in fact he was examined April 6th, and not again until August 10th, when there were some signs of spinal caries; that is, he had pain at the epigastrium and a stiffness of the spinal column, but there was marked spinal tenderness. He had also a ravenous appetite. A blister was ordered to the spine, and on the 17th the only symptom that had disappeared was the spinal tenderness. His mother brought a specimen of his urine on the 30th. It was dark colored, alkaline in reaction, non-albuminous, but contained about twenty per cent. of blood. The microscopic field was full of blood corpuscles. He suffers now from a tertian type of fever, and was treated last spring for malarial fever. Next day we found on examination a moderate amount of splenic enlargement. The urine was examined two or three times, and the



blood diminished in quantity as the febrile symptoms subsided.

September 8th. No pain, no stiffness, contour of spine normal.

We submitted him to a very thorough examination on the 19th of October with negative results.

December 28th. Epigastric pain has returned recently, and the boy is walking with spine stiff again. Four days ago the mother observed a little fullness of the spine between the scapulæ, and now there is a distinct angular prominence measuring one quarter of an inch in height. A brace is applied forthwith.

January 19th. Acute synovitis of left knee with considerable fluid in the joint and the leg is held in semi-flexion. The circumference is only three quarters of an inch greater than that of its fellow. There is no extra heat, and very little tenderness; motion is easily made, and the distention of the synovial sac is demonstrated when the leg is acutely flexed. He complains a little of pain in the right knee. The left is enveloped in cotton wool, and the joint is put at rest in an apparatus. 25th. Marked distention of synovial sac of right knee. 27th. Admitted to the hospital, placed in a rolling chair, knees put up in straight splints, and the effusion disappeared within a month. The functions of the joints were unimpaired, and the synovitis has not recurred. He is still under observation for the spinal caries, recovery from the knee and ankle diseases having long since been well established.

NOTE. — Since preparing this article for publication the new edition of Holmes's *Surgery* has appeared, and I find that my friend Dr. E. H. Bradford, who revises the chapter on Diseases of the Spine, makes this subject of early diagnosis exceedingly clear. His remarks can be found in Vol. III., page 301., Philadelphia edition.