Original Articles.

THE DIAGNOSIS OF POTT'S DISEASE OF THE SPINE BEFORE THE STAGE OF DEFORMITY.

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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 treatment 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, 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 certainly unerring. After a year's treatment he allowed the little patient to stand on its 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 student 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 osteitis of one or more of the bodies of the vertebræ, and understand that this osteitis 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 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 examina-

tion 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 diagnosed, 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 ostitis 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.

— According to Dr. Carpenter, the average mortality from small-pox in the olden time, say from 1660 to 1780, was 4483 per million; but with the discovery of vaccination it fell to 2040; with the provision of public vaccination to 400; and under the compulsory vaccination system it has fallen to 276.

HIGH-PRESSURE EDUCATION; ITS EFFECTS.

BY ROBERT T. EDES, M. D.

IN private practice, that old but ever newly christened sister of debility and hysteria, successively appearing as "spinal irritation," "spinal" or "cerebral anæmia," or "nervous prostration," but now more familiarly known as neurasthenia, is only too familiar. In these wards, although the *clientèle* of the hospital does not lie chiefly among the classes where this affection is most commonly developed, it is by no means rare. Here, as well as in private, it is far from being the exclusive property of the neurologist, for it has frequently claimed the attention of the surgeon, for some affection, real or supposed, of joint or "spine," and is almost certain to have received the assiduous cares of the gynæcologist before settling down into a well-marked condition of chronic invalidism.

The description of these cases in general terms, and with a just appreciation of all the varied symptoms which may attend them is unnecessary. The pains in back and head; the inability to read, to think, to act, and sometimes even to exist without increasing them; the general feeling of utter weariness, of loss of interest in all human affairs; the feeble and irregular circulation, leading to coldness, objective and subjective, of the extremities, and to many other abnormal sensations, perpetuated and magnified by an attention otherwise unoccupied, are familiar to all.

These patients are not necessarily hysterical or even "nervous," in the common acceptance of the word, but they have usually been well educated as to all the parts of their pelvic viscera which can possibly have an "itis" added to their names, are learned in pessaries, talk glibly of the "base of the brain," and know to the fraction of a milligramme just the dose of any drug, possibly the most feeble, which is required to produce an effect upon them.

The treatment of this affection is so largely moral and hygienic, depends so much upon the individuality of the patient and of her attendants, and has been the subject of so much literature, that I shall say nothing about it.

But my attention has been somewhat strongly directed to certain points in its ætiology, which have often been the subject of professional comment, but which will bear to be again discussed and insisted upon, since, in dealing with an affection, difficult and tedious in its treatment, which makes of so many who might be among the most useful members of society mere burdens to themselves and to the community, nothing can be of greater practical value than forcing upon the attention of responsible persons a realizing sense of its *avoidable* causes. These cases seem to originate under two almost diametrically opposite conditions, which may be briefly named, *underwork* and *overwork*. This apparent contradiction finds its parallel in the atrophy which may arise in cases having the appropriate diathesis, in those muscles which are most exposed to excessive exertion, or, on the other hand, in consequence of disuse or paralysis.

Invalids, who have become such because they have nothing better to do, have probably existed ever since there has been a class able to live without exertion, and willing to take advantage of the opportunity. The members of this class, who have felt no spontaneous impulse to work, and to whom external circumstances have furnished no definite object for labor of