Original Articles.

THE DIAGNOSIS AND TREATMENT OF HIP-JOINT DISEASE.¹

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THE subject has become a hackneyed one so far as I am concerned, and I find it difficult to present anything new or interesting. Cases that have been carefully recorded sometimes furnish instruction, and I have decided to make this a clinical report, and, from the histories here recorded, will attempt to emphasize certain points in diagnosis and treatment.

CASE I. Disease in first stage; prompt protective treatment; splint continuously for one year; result, a cure with perfect restoration of function.

On the 11th of April, 1887, a boy, four years of age, living in Minneapolis, Minn., came under my care for chronic osteitis of the hip, right side. The maternal family history was decidedly tuberculous. I recorded at the time a number of details confirmatory of this diathesis. The patient himself, when ten months of age, had whooping-cough, and it was many months before he fully recovered. Indeed, his mother thought he had never recovered. He had been treated for catarrhal trouble as a result of this cough. For at least a year before he came under my observation, a peculiarity in his gait had been noted. He favored the right limb, turned the toe in while walking. The mother was positive that at no time was he free from this slight limp. She was equally positive that he had had no pain for at least six months after the first appearance of the limp. Then, while wintering in Florida, he complained of pain in the groin. Shortly after the occurrence of the pain, he had a fall, which made him more lame than usual. His pain was quite severe; immediately after the fall, he complained of his knee. A physician in St. Augustine diagnosed hip disease. The little fellow was unable to walk for three or four days. Then he got on his feet again, and had been free from pain ever since.

At the time of my examination there was a slight change in the ileo-femoral crease compared with that on the other side. There was no atrophy of the limb, no joint tenderness, no fulness about the joint, no glandular enlargement. His limb was parallel with its fellow, with the exception that, as he stood, he toed-in a little. On flexing the thigh to an acute angle he showed reflex spasm, that is, he resisted, winced a little, and by flexing the left limb, I got no such sign. I could rotate the right limb quite as well as the left, but could not abduct completely without encountering this same reflex spasm. I repeated these tests several times with uniform results. Taking into account the history, the exacerbation during the winter, the persistence in lameness, and the few signs found at this examination, I expressed my belief that osteitis was present, though deferred treatment until after another examination, which was made four days later. Examination then revealed the same signs. I learned at this time that a friend of mine, a distinguished orthopedic surgeon in New York, had expressed the same view, and had advised apparatus.

It was the first of May before I succeeded in getting

a splint supplied, owing to certain unavoidable delays. The apparatus is the one commonly used, and consists of a stem, pelvic band, perineal straps, and high shoe on the sound foot. This is a perineal crutch practically, and is intended to protect the joint against trauma. The child walked on his perineum. I had some difficulty in carrying out the details because of certain chafing of the limb that occurred from the adhesive strips. It was difficult to make the mother appreciate the importance of protecting the joint at this stage. Still, by dint of perseverance, I succeeded in overcoming all obstacles and protected the joint until the summer of 1888. The apparatus was employed night and day. The first few weeks it was not changed except under my personal observation, then the limb was steadied. Later on his mother was taught how to change the adhesive plasters.

At my last examination there was no sign of disease present, the apparatus was removed, and he walked without any lameness. I saw him a year later. There had been no recurrence whatever, and the case has remained cured.

CASE II. Disease in early stage; prompt application of protection-splint; not an untoward symptom afterwards; apparatus for at least eighteen months; result, cure with perfect restoration of joint functions.

On the 7th of January, 1888, a boy, eight years of age, was referred to me by Drs. William T. Lusk and William H. Flint. His history was briefly as follows: Two years previously a slight limp, right side, was observed. He had no pain. This lameness lasted a month or so, the boy complaining occasionally of a slight aching in the joint. After that it was thought that he did not limp for a period of at least eight months. Then, without apparent cause, he began to go lame again, got better, but had never been from that date to the date of my first examination, free from a halt. In November, 1887, he came under orthopedic treatment, wore a short splint; but the joint did not seem to be sufficiently protected, he had occasional pain, and for this reason was referred to me for treatment.

I found him well-nourished, quite active, limp very well marked; nates flattened; thigh three-quarters of an inch smaller than its fellow. Movements when carried to extreme limits in all directions produced reflex spasm, particularly in rotation. There was no infiltration about the joint, no bony enlargement, no joint tenderness even. The soreness was mostly peri-articular. The limbs were equal in length. The diagnosis was osteitis of the right hip, chronic and probably tubercular.

I had no difficulty in persuading the father that absolute and unconditional protection was required. So we lost no time in applying a long traction-splint. From that date he never had any more pain. The splint was discarded on November 4, 1890. At that time the extension was perfect, flexion perfect, abduction not quite perfect, but no reflex spasm excited. The limbs were equal in length; there was one inch and a half atrophy of the thigh; knee action was good. I have had an opportunity of examining this boy from time to time up to the present summer, and his good condition remains unimpaired. There is no lameness whatever, he is very active, and leads an out-of-door life.

These two cases are presented to illustrate the early diagnosis made upon the existence of certain signs,

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and further to illustrate the efficiency of protective treatment. The result in each case was perfect. The treatment has been very simple, but extended necessarily over a long period of time. This was done because the pathology which I adopt is this, — a tubercular inflammation in the epiphyses, near the epiphysal line, behaving exactly as similar foci do in the lung, subject to the same influences of trauma, and resolving, if sufficient protection is given and if good hygienic surroundings can be obtained.

CASE III. Disease in second stage: plaster-of-Paris spica first; protection splint for two years; abscess toward the close of second year; aspirated, subsequently opened spontaneously, soon closing; Dowse convalescing splint; excellent result, with very little lameness, a half-inch shortening.

On the 9th of July, 1884, a boy, seven years of age, was referred to me by Dr. Whitbeck, of Rochester. He began to limp in the spring of 1884. At that time he had rather a sharp exacerbation of pain. No cause could be assigned, in the way of trauma, at least. A second exacerbation came on a month or two later. His family history was fair. A trace of tuberculosis was found.

At the time of my examination there was one inch practical shortening, which is the shortening found by measuring from the umbilicus to the internal malleolus. There was no real shortening. By this I mean no difference by measuring from the anterior superior spines to the malleoli. There was an inch atrophy of the thigh. The hip was locked at an angle of 150° , practically no motion. There was no joint tenderness, but considerable periarticular tenderness, as evinced by pressure and attempted movement. There was fullness in groin and above trochanter major; pain at night, though no screaming during his sleep.

I applied at once a plaster-of-Paris spica bandage until I could get a splint ready, which was on the 25th of July. The perineal straps chafed a good deal, and it was some time before he wore the splint with comfort. By the 1st of August, 1884, he was getting about very comfortably. He had no pain during the fall of that year; the deformity became less marked. A year later it was necessary to lengthen his splint, and all the attention he required was an occasional readjustment of the adhesive straps. In 1886 he developed an abscess on the outer side of the thigh. This was aspirated. He suffered considerably during the formation of the abscess. It finally opened spontaneously, and closed within a few months. In the spring of 1889 he had so far recovered that I applied a jointed splint, what is known as a Dowse, which is a long splint with the addition of a joint at the knee, secured to the thigh and calf by a lacing, but not used for traction. This was discarded the following year, 1890. From that time to the present he has had no recurrence of symptoms. I have examined him once in about six months merely for record. My last examination was on the 15th of September, present year. There was no practical shortening, one-half inch real shortening, one-and-a-half inch atrophy of the thigh, one inch of the knee and three-quarters of the calf. The thigh could be extended to 160° and flexed to 150° . He had very little lordosis, stood with limbs very nearly parallel. He goes to school every day, walks with a very slight halt, and the result altogether is very good.

CASE IV. Disease in second stage; protection

splint for a year; then abscess, which was opened, with prompt healing; apparent cure; then relapse, with deformity; osteotomy for correction of deformity; excellent final result, almost a perfect cure.

A boy, two years of age, was referred to me on the 15th of July, 1885, by Dr. Hungerford. This child was one of six. Had always been weak on his limbs, so his mother reported. Had measles in December, 1884, was a long time convalescing, had phlyctenular conjunctivitis. He favored this left limb for five months prior to the date of my first observation. Two weeks before I saw him he fell, spreading his limbs apart. Came in the house crying very much, and was lamer than usual. A few days before I saw him he was apparently unable to walk. He held his limb flexed at an angle of about 150° and resisted all movements. The parts were very sensitive. A diagnosis was made without hesitation, a splint was applied, and he did well until early in the following spring, when an abscess appeared. It was opened, thoroughly cleansed, and an effort made to secure asepsis. This was not satisfactory, but the traction afforded the limb seemed to suffice, the discharge became less, and in June, 1887, there remained only a small sinus. This sinus closed during the summer, and on the 16th September 1887, it was entirely healed. The angle of deformity was about 175° . The limb could be abducted over a small arc and rotated over about one-half the normal arc; thigh could be flexed to about 150° . The limbs were equal in length. There was an inch and a half atrophy of the thigh, three-quarters of the knee and one inch in calf. He continued the use of his splint until September 30, 1890, when the adhesive strips were abandoned and the splint was made into a kind of semi-caliper, which consisted of the same apparatus, the foot-piece being converted into a stem which passed through a tube in the heel of the shoe. He wore this for some months and then abandoned all treatment. This was without my advice. On the 22d of May, 1891, I found that he had a deformity which was unyielding. So, on the 24th of June, I attempted to correct this under ether, by manual force, but failed: then divided the femur below the trochanter minor and brought the limb down into normal position. He left the hospital on the 16th of July, with limb down to an angle of 170° . On the 6th of August I found the limbs parallel, angle of greatest extension about 175° , one-half inch shortening, real, no practical shortening. September the 29th, I saw him again, and his limb could be extended to 180° . He walks well; is wearing a convalescing splint.

CASE V. Disease with long first stage in an adult; *brisement forcé*; aggravated case; traction in bed, then splint gave prompt relief; prolonged use of splint; abscess aspirated, finally opened; second one disappeared under pressure; case convalescing; patient attending to business all the time.

On November 25, 1887, Dr. Robert F. Weir asked me to see with him in consultation a gentleman, twenty-two years of age, who had been an athlete, and who was suffering at the time of the examination from what we diagnosticated as chronic osteitis of the left hip. The patient was a hearty, robust-looking man, — family history on one side tuberculous. Four years before, while playing foot-ball, he sprained his hip. Thinks he was annoyed for two or three months thereafter with a little stiffness at night. At the end of this two or three months this stiffness passed off, and it was

almost a year later that he was troubled again with a recurrence of symptoms. So that he dates his lameness to the beginning of this second attack. Then he consulted a distinguished surgeon, now passed away, and a strain was recognized, the patient advised to keep quiet. He did not follow instructions, but continued in milder athletics until June, 1887. Dr. Weir saw him at this time, found a little swelling in the Scarpa's space. The aspirator needle was inserted with negative results. The thigh could be flexed to 90° then, quite easily, and the other movements were equally good. Expectant treatment was employed. The patient went to the country and played tennis during the summer. In the early fall he became anxious again and two or three surgeons were added to the consultation, Drs. Sands and Bull. Traumatic hip disease was diagnosed, and it was advised that the adhesions about the joint be broken up, under ether. This was done about three weeks prior to the date of my call. Considerable inflammatory reaction followed.

We found limbs parallel, but the slightest attempt of movement caused great pain referred to the anterior surfaces of the thigh and down to the knee, with general infiltration about the hip, though no distinct tumor about Scarpa's space. There was no atrophy of the limb. Limbs equal in length. Spinal column quite flexible. The diagnosis was made of osteitis, splint was advised, and the treatment begun at once, the weight and pulley being used, pending the completion of the splint. This was applied December 17th. He was not allowed to get out of bed for at least a fortnight. He got relief at once. On February 2, 1888, he was going about using the splint, with axillary crutches. Had an occasional starting pain at night, but nothing of any serious moment. He went to the country in the following summer, and in the spring went to the University of Virginia, where an abscess developed on the outer side of the thigh about the middle third. This was aspirated by Dr. Dabney, of the University, but with rather unsatisfactory results. I saw him in the fall. The abscess had opened spontaneously. Simple dressings were applied, and he continued to go about as usual. During the winter of 1888 and '89 he had a hemorrhage one night, which was not repeated. Dr. Loomis has examined him from time to time since then, finding nothing to account for this hemorrhage, but advising that he avoid too much exercise and rely on climatic influences. July 5, 1889, the sinus was about closed, but on the inner side of the thigh was a distinct swelling, with fluctuation. Dr. Weir saw him with me, and advised against operative interference. By the 24th of September this tumor was reduced to one-half its original size, general health was good; the patient was working at a desk in Wall Street. On the 7th of February, 1890, the report was made that his general health was very good, weighed 190 pounds, a gain of twelve pounds in the last six weeks. There was no discharge from the old sinus, no fluctuation of the tumor on the inner side of the thigh. The thumb could be thrust well down into the old sac, which seemed to be quite empty. Rotation of the hip very fair, limb well developed. No infiltration about the hip, no tenderness or soreness. On October 2, 1890, there was no sign of any abscess; limbs equal in length; still using his splint; still attending to his business. The notes made from that time to the present show very little alteration. When I last saw him, which was August 20th, I advised that the splint be

discontinued at night. I expect during the winter to apply a jointed splint and to remove the high shoe from the sound foot. The case is certainly convalescing, and the outlook for a useful limb is excellent.

CASE VI. First diagnosis sacro-iliac disease, right side; later, hip disease, left side; later still, hip disease, both sides, abscesses, right side; progressive septicæmia in spite of rest and protection-treatment; excision as *dernier ressort*; excellent result.

On January 22, 1890, a boy, nine years of age, from Poughkeepsie, New York, was admitted to the hospital. He had been under observation in the outpatient department for three or four weeks, a diagnosis having been made there of sacro-iliac disease, right side. The diagnosis was based upon tenderness, peculiarity of gait, persistent pain over the sacro-iliac junction. The hips had been carefully examined with negative results. No reflex spasm whatever in any direction. The mother was advised to put him in hospital and allow us to trephine at the sacro-iliac junction and "nip" the disease "in the bud." Accordingly she admitted him.

There was no special fulness about this region, and it was decided to keep him in bed a few days and study the case more carefully. This tenderness persisted. The boy was in very good condition. After a week's time a blister was applied and operative interference was postponed.

Suddenly, one morning, after he had been in the hospital about three weeks, he complained of pain in his left hip and knee. Then we learned from the mother, who made a visit that day, that he had complained of pain in the left limb in the latter part of September, 1889, that he was quite lame for awhile, but the symptoms soon passed off and she gave no further attention to this joint. The boy was examined quite carefully, and the left side was found to be a half inch smaller than the right. With this exception there were no signs. A few days before this pain came on in the left hip and knee, he complained of pains about the left sacro-iliac junction and there was tenderness here. It was recorded on February 15, 1890, that he could flex and extend both hips perfectly, abduction and adduction of thighs good, though there was this same peculiar limp referred to the sacrum.

It was noted March 4, 1890, that there was some reflex spasm about the right hip, and on the 12th, pain in the right knee. The pain about the sacro-iliac junction had disappeared. On the 19th of March, the pain persisting in the right knee, he was put up in a plaster-of-Paris spica bandage, traction being made by weight and pulley in bed. March 29, 1890, the left hip was examined carefully without signs. On the right side the glands were infiltrated, there was fulness in iliac fossa, as well as on the anterior aspect of the thigh. A hip-splint was applied to this side, and the boy was put in a reclining chair. Next day he was suffering a good deal and was put to bed.

April 8th, the signs returned in left hip again, and the movements were all limited, so that a double plaster-of-Paris spica bandage was applied. On the 26th of May, 1890, the plaster had chafed a good deal about the bony prominence and the boy was losing flesh. He had a high temperature and he was put on the Cabott frame. A note was made August 22, 1890, that a large abscess had formed. It was aspirated on this date. Three or four days later it was

aspirated again, and about eight ounces of pus were removed. On September 30th, it was noted that the abscess had opened at the point where the aspirator needle had been inserted, there was a sinus, and on this date he was put under ether, the sinus was enlarged, sac pretty well evacuated, and the cavity well washed out and drained. He got very little relief after this, and on December 23, 1890, it was noted that he was suffering considerably, that the discharge was profuse, that the boy was emaciating, in spite of all the traction on both limbs in bed, that he was losing ground. So the abscess was thoroughly cleansed again under ether, and an attempt made to reduce the discharge. At this time all the sinuses about the sacroiliac junction had disappeared, and it was a question, now, whether we would be able to save his hips. On January 28, 1891, another abscess was found about the right hip. This, in a few days, opened spontaneously. The drainage was good, parts were dressed every two or three days, was taking tonics and stimulants, traction was kept up unremittingly.

February 10, 1891, he had become so thin, was suffering so much, his temperature continued without any abatement, that, as a *dernier ressort*, his right hip was excised. There was very little left of the head of the bone. Acetabulum was scraped, no attempt made to get thorough cleansing of cavity, but the operation was done rapidly, the offending portion of bone removed and cavity packed with iodoformized gauze.

In this connection it may be interesting to note that on the 29th of January, 1890, we began to take his temperature night and morning. On this date it was 100.2°, on the 5th it was 101.6°. It ranged from this down to 98.4° until the 5th of March, when it reached, in the evening, 103.8°. On the 10th, it was 103.6°. On the 14th of October, it was 104°. On the 12th of November, it was 104°. It seldom fell to normal, only on two or three occasions in six months. On the 10th of February, 1891, it was 100.8° in the evening. This was the day of the operation. It reached 100.4° next day. It did not get above 100° until the 16th, when, in the evening, it reached 101°, then fell to 99° next day, and continued under 100° until the 8th of April, when it was 102°. On the 17th it fell to normal, and has remained normal up to the present time. That is, we kept a faithful record of his temperature from January 29, 1890, to April 22, 1891, at which time the sinuses were discharging very little, and he was evidently improving. He was still kept in plaster-of-Paris from the ankles up to the free ribs, the discharge was growing less and less, and every prospect for recovery was entertained.

He was sent to Saratoga in the early part of July, 1891. The sinuses were dressed very infrequently during the summer. Toward the close, on his return, he was stout, hearty-looking, and there was only one sinus, in front, which was discharging, and this was soon covered by a scab. At present writing everything is closed, plaster has been removed, and the examination recorded September 16th, showed that in the right limb, angle of greatest extension at hip was 180°, angle of greatest flexion about 150°. The left thigh could be extended to 180°, and flexed to 135°. Abduction and adduction were about one-half normal. There was a little thickening about the right hip, but no fluctuation.

He is to be fitted with a Thomas hip-splint, to extend from the scapulæ down to the calf, this splint to

be applied to the right side merely to retain limb in good position. The left limb is very serviceable. Is to have a pair of axillary crutches, and as the right limb is about one inch shorter than the left, no high shoe is to be employed. The recovery is, therefore, excellent.

All of these cases, with the exception of the last, are reported to show the comfort with which patients get on, even if they have abscesses, when the joint is protected. Case V shows that the disease may develop in the adult and pursue about the same course that it does in childhood. Case III shows that the deformity can be corrected by an osteotomy, and Case VI is reported to outline the indications for excision of the hip, and a careful study, I think, will bring out points, not only in favor of excision, but in favor of protecting the parts for many months after the operation, and even after all sinuses are closed.

The conclusions, I think, that may safely be drawn from these few cases reported in detail, are:

- (1) An early diagnosis can be made by any one who examines the case carefully, and who familiarizes himself with the functions of a sound joint.
- (2) The necessity of regarding a case as chronic and therefore requiring prolonged protection of the joint.
- (3) The comfort that any patient may derive from an apparatus that is made to fit.
- (4) The benign progress of a case thus protected.
- (5) The importance of maintaining parallelism and equality of the limbs at all times and under all circumstances.
- (6) The advantages of an out-of-door life, which cannot be secured by bed treatment.
- (7) The necessity for excision of the hip when well directed efforts at securing rest and protection to the joint have failed.

I have not attempted to give the details of treatment, have said nothing about how the splint should be applied, where it should be obtained, and what care is required during the whole course of treatment. The average practitioner should know principles, should be a good diagnostician, and should understand the pathology of the diseases he is called upon to treat. Details can be learned from the text-books and current literature.

The following is taken from the Supplement to the *British Medical Journal*: "Under the title 'Cæcitas Syllabaris et Verbalis, sed non Litteralis,' Professor Ivan P. Mierzejewski, of St. Petersburg, describes in the 'Vestnik Klinicheskoi i Sudebnoi Psikiatrii i Nevropatologii,' Vol. 11, 1891, a case of peculiar word blindness with normal letter vision. The patient who was a very nervous medical man, noticed that he was unable to read, though he could distinctly differentiate letters, and his sight was otherwise good. At present, examination shows that he actually can differentiate every individual letter, but utterly fails to combine letters into syllables or words." We feel obliged to confess that while reading the first few lines of the above clipping, we were affected by the same symptoms. Our greatest surprise is that in Russia these symptoms should be so rare as to be deemed worthy of mention. In looking over Russian literature we have even doubted whether we were possessed of "normal letter vision."