Observations on the mechanical treatment of disease of the hip-joint / by Charles Fayette Taylor.

OBSERVATIONS

ON THE

MECHANICAL TREATMENT OF DISEASE OF THE HIP-JOINT.

BY CHARLES FAYETTE TAYLOR, M. D.

In my intercourse with medical men I am so impressed with the amount of misconception of the means used and the paramount object aimed at by the advocates of mechanical treatment for disease of the hip-joint, that I desire briefly to set forth my own views in regard to some of the ideas and the more important methods which considerable experience has seemed to establish as controlling in such cases.

The subject may be introduced in the form of the following propositions, namely: First. All organs while in a state of disease require rest from the performance of their functions in the direct ratio of the amount, quality, and intensity of the abnormal movements. Second. What is rest for an organ in one condition is not necessarily rest for it in another condition; that is to say, an organ, in a certain degree of *pro*gressive inflammation, presents conditions essentially different from the same organ in the same relative degree of inflammation in the *retro*gressive stage.

The so-called "mechanical" treatment of hip-joint disease, so far as I understand it, is simply the *working out* to practical conclusions of responses to indications to which the above propositions give the key-notes. The difficulty with the non-specialist in these cases is that he is apt to give altogether too much importance to appliances and too little to the varying states of the disease. While he is contemplating different kinds of "splints" the disease is carrying off his patient. If he would seek only for the exact indications, the best means for responding to them would be likely to suggest themselves, and he would be surprised to find how simple and easy it would be to effect his object. The mechanical treatment of hip-joint disease is not a question of splints, — nearly everything can be accomplished by cheap and home-made appliances, once the condition is clear in the mind, — but one of different conceptions of symptoms. The particular means of answering the indications must follow the conception. They do not, or at least they ought not, to precede it.

Now, heeding the logic of hip disease, we attempt first to ascertain

and then to answer all the indications. The first is to give rest to the diseased joint. The plaster-of-Paris and other dressings, sand-bags, and similar means give rest only in part, and the lesser part at that. This is our conception of the case. For rest from motion is relief from only the minor labor of a diseased hip-joint in the acuter stage. The pressure from irritated muscles at this time is a much greater evil than motion alone could be. To overcome the injurious pressure from irritated muscles is, then, imperative. Hence, we must stretch them, and we find that practically a splint is more efficient than any other means, because by a splint we can secure the more definite and concentrated effect of counter-extension, and a splint also enables us to enforce a better hygiene. There seems to be a general quandary in regard to the amount of extension which ought to be employed. There never was a question more easy to answer. We must carry extension until the muscles relax, and then we must maintain the extension until they lose their irritability and the inflammation in the joint has been given time to become retrogressive. This process will require, on an average, from three months to eight or twelve, depending on circumstances. But there are indications for extension so long as the muscles are rigid, and until there is evidence of material subsidence of the inflammatory action. Then, with the setting up of the reparative process, there should be motion in the joint in order that the reparation shall be completed under the stimulus of motion. For, when the retrogressive process has advanced to a certain stage, immobility, which in the acuter stage secured one kind of rest to the joint, becomes with the altered condition of that organ a burden or a labor, tending first to retard and then seriously to modify the nature of the reparative process going on in the joint. Long before the articular surfaces can bear pressure without injury they require the stimulus of motion for the perfection of the reparation going on within them. Immobility at this stage stimulates plastic exudation and union between the joint surfaces, while motion determines the formation of reparative tissue similar to and to answer the purposes of that which was injured or destroyed. If immobility of a healthy joint causes plastic exudation and anchylosis, of which there are many examples, then much more ought we to expect, when a previously diseased joint is motionless, that adhesions of the joint surfaces would take place. And this, in my experience, is actually the case. In other words, if immobility of a healthy joint causes a morbid process to be set up, we ought to expect that such a process would be set up in opposition to the reparative process when a corresponding stage is reached in recovering.

Thus we see that "extension" can cover, as a means of treatment, but a certain portion of the time through which an inflammation of the hip-joint must pass in its several stages. There are positive indications

for extension, but there are as positive limitations to its use. The limitation is reached at the point of time when the muscles have become soft and compressible, and the interstitial movements have become completely retrogressive. From this moment reflex irritation of the muscles ceases entirely, and with it the necessity for extension. Motion, also, which might do injury — was sure to do injury if there had been the least pressure in the joint — at a previous stage, becomes now a necessity to a perfect articular hygiene. So that the indications become completely changed, and the methods which had been efficient up to this time must be abandoned in consequence of the very success of their use. After this the joint needs a different kind of protection, till the completeness of the reparation makes protection unnecessary. Thus the splints or instruments are determined for us. After this stage they must be contrived so as to promote joint motion, not to prevent it. The mechanical means must suit the actual conditions present, and must lead logically to the end sought by treatment. They must vary in different stages of the same case, and even more in different cases. It is absurd to speak of "an instrument for hip disease." There can be no one complete instrument for hip disease. There can only be instruments calculated to answer the indications present at some stage of hip disease. The surgeon who treats disease of the hip-joint by a method calculated to fulfill but a single indication, whether by gypsum or other bandages, sand-bags, splints, or what not, fails, in my opinion, in his conceptions of the elements of the case, as he surely will fail of securing the best attainable result. Two or three cases will illustrate the pertinency of the foregoing observations. The first is a typical and comprehensive one.

S. F. McD., four years old, was first brought to me in July, 1876, in consequence of a slight halt in his right leg. Some weeks before he had twisted it by falling out of a rocking-chair; this was followed immediately by severe pain, lasting four days and nights. During this time the limb was flexed. The pain was of a spasmodic character, occurring very frequently. But he soon got over the injury, as was thought, and when, later, a limping was noticed, it was not connected with the accident. There was but the slightest difference in the motions of the two hip-joints when he walked, and no pain at this time, nocturnal or other. Yet it was certain that the joint was affected, and I gave an opinion accordingly. The child had been treated for rheumatism. My advice that he be put under treatment for disease of the hip-joint was not acted on. In October the child was again brought to me, this time complaining of pain, especially at night, and limping, not badly, but decidedly. The case was evidently rapidly approaching the suppurative stage, and I said so to the father. Not being ready to believe that the case was so bad, he still declined to act on my opinion.

He returned on the 10th of January, 1877. At that time the joint was suppurating rapidly, there was great constitutional disturbance, the thigh was strongly flexed on the pelvis, motion was excruciatingly painful, and the affected hip was greatly enlarged. Treatment was commenced on the day last mentioned. It consisted in the use of the counter-extension splint, and the patient, as is usual during the first month of treatment, was kept in bed. The recumbent position, during the first few days or even weeks of treatment, relieves nervous depression, gives time for the patient to accommodate himself to the novel situation, enables us to save the amount of his weight from the perineal straps, and by that amount increase extension and hasten the effects of treatment. The child had a thin, tender skin, and the perineal straps causing some excoriation, a weight and pulley were added. The cord was attached by means of a hook directly to the lower end of the splint. The splint, as shown by the dynamometer, exerted a force equal to an average of eight pounds. To this five pounds were added by means of the weight and pulley, so that it required about thirteen pounds' weight to overcome the muscular resistance. The object was, as it always is in such cases, to carry extension to a point sufficient to cause complete relaxation of the muscles. And here I may say that care should be taken always to keep a surplus of force opposed to the irritable muscles. The suppuration not subsiding, and the abscess approaching within reach, it was opened on the 30th of the same month by a free incision. Lint was inserted to keep the parts from uniting, and thus to give free drainage to the fluid, which discharged copiously one or two months. At this time the patient came under the observation of Dr. E. H. Bradford, of Boston, who kindly assisted me in attending him during a couple of months. In February and March he suffered a good deal, and the full amount of extension had to be kept up. Another abscess developed further on the outer aspect of the thigh, which was evacuated so soon as it was discovered. In fact, several openings formed, the inflammation seeming to be rapid and destructive. About the first of April, or, say, three months after the beginning of treatment, the pain had subsided, the sinuses discharging freely, and no new ones appearing, he was allowed to begin to walk, the joint protected, of course, by the splint which he wore, and which kept up continuous extension in whatever position he might place himself, whether standing or lying. From this time onward there was uninterrupted progress of the joint reparation, marked by several epochs of interest to the student of this disease. Our notes say: "May 9th. Excellent health; tolerable mobility of joint; thigh in good position. Pus discharging from two openings on the outer aspect of the thigh, but apparently more from a slough which had occurred there than from a deep-seated source. Thigh still considerably swollen, and hard in upper portion.

"August 1st. Slight discharge from two openings. No pain nor tenderness. Easy mobility at hip to a moderate extent. Excellent health.

"December 28th. Patient ready for second instrument several weeks ago, but there being considerable adduction and a tendency thereto, the ordinary second or 'jointed supporting splint' was modified so as to take the weight of the body on the *opposite or left side* of the pelvis. By this arrangement the thigh was abducted with each step, the joint was protected most perfectly, and at the same time freedom of motion in the hip and all the joints of the affected limb was allowed. Abscess still discharging moderately. Mobility free but to a limited extent, especially laterally. Health perfect.

"March 30, 1878. Abscesses have been closed during the past two months. Good and easy mobility at hip in every direction. Child very active and nimble.

"December, 1878. Every motion perfect. Patient has been receiving a portion of his weight on the affected hip during the past two or three months without the least harm. He is discharged cured. He does not limp. There is a slight difference in the lengths of the lower extremities, but not enough to be noticeable in his locomotion. He is directed to return frequently during the next two years, for examination."

The comments on the above case need not be extended. I would simply call attention to the serious nature and rapid progress of the disease prior to the commencement of the treatment; to the suppuration and evident destruction of some portions of the articulating surfaces; to the two months during which his system was recovering from the shock it had received, before retrogressive action was fairly established; to the progress after that; to the relatively small amount of motion during the first portion of the period of recovery, and the probability that anchylosis would have been inevitable with any plan of treatment which did not involve provision for motion at, with protection to, the hip-joint as a part of the articular hygiene necessary to the most complete reparation. I would especially direct attention to the probability that the drying up of the abscesses was very much accelerated by the action of the muscles contiguous to the affected parts, whether soft or bony; and, lastly, it would seem not too much to say that whether the hip-joint can recover with motion intact after ulceration ought no longer to be questioned. That this joint was suppurating there cannot be any doubt.

Without entering more minutely into the details of mechanical treatment, I will give one or two cases bearing on the insufficiency of position, either with or without extension, to secure the best attainable results.

M. K., girl, seven years old, was first seen on the 8th of March, 1876. Her history is as follows: About nineteen months before, the

child gave signs of disease in the right hip-joint, and the diagnosis being made she was confined to the bed, and treatment by means of the weight and pulley was instituted. Everything seems to have been done which was possible with the inadequate means employed. There was no pain from the beginning, nor during any part of the time she was under treatment. Her general health seemed to be perfect. Yet, after a certain amount of improvement, as indicated by diminished flexion and some increase of mobility at the joint, there seemed to be no further progress. After fifteen months there was still imperfect mobility, some slight shrinking on attempting motion; a little limping when using the affected limb. The increasing softness of the soft tissues and other constitutional evidences indicated that the limit of confinement without general deterioration of nutrition, as a result of imperfect hygiene, had been reached. What was to be done? To remain indefinitely in bed is impossible. Hence the turning out of so many patients to relapse, and the importance of methods which render one independent of time. Notwithstanding the previous extension, the muscular tonicity, being more than normal, indicated the necessity for relaxation. This was done by means of the counter-extension splint during two weeks, *and till the muscles were completely relaxed*, when the jointed supporting splint was substituted and the child set upon her feet. From this time there was uniform amelioration in the condition of the muscles and of the joint till, after ten months, during which time she had every consistent liberty of motion and locomotion, including fresh air and exercise, the splint was removed and the patient discharged perfectly restored. It is now two years since that event: the child has been going about like other children; there is perfect motion at the affected joint, and no discoverable difference between the functions of the two limbs. Both trochanters are on the same level.

In regard to the permanency of the cures effected by mechanical means, the following case may be interesting: —

R. A. C., a lad five years old, began to lose his appetite and to show signs of decline in the fall of 1866, accompanied with limping on the right limb, nocturnal pains, wakefulness, etc. In May following he became unable to walk, at which time he came into my hands. The treatment continued during about ten months, when he was discharged cured. Within a few weeks I have had the privilege of examining this case, now a healthy young man of seventeen, in active business, requiring him to be constantly on his feet, and I had to ask him which had been the affected limb. Examining him carefully, — I may say mathematically, for patients are always examined on a paper marked with lines and cross-lines, so that nothing is guessed at, — I found the trochanter of the previously affected side to be five eighths of an inch higher than the other, but the motions of the joint were perfect, and he

has never had any evidence of disease or one moment of lameness in that joint since his discharge.

The recumbent position may be assumed for a limited period with decided advantage, especially in the beginning of the treatment. The weight and pulley, as a means of extension, answer very well in an exigency, or as a means of increasing the amount of extension, or of diminishing the pressure of the perineal straps in certain cases which seem to be especially intolerant of it. But the weight and pulley, as a method of treatment, are incapable of producing that positive local effect on the muscles about the hip-joint which is especially characteristic of counter-extension. A given weight attached to the limb simply drags the whole person downwards, exerting, to be sure, a certain amount of force against the hip-joint muscles, but not affecting them in the same positive and purely local manner that counter-extension does. But recumbency, while serviceable in exigencies and as a contingent aid, interferes too much with the general hygiene of the patient to be depended on as a complete means of treatment. Whatever the immediate benefit which may be experienced in the earlier months of the confinement, the deprivation of fresh air, exercise, and the impairment of the digestive and assimilative functions, begin to interfere with the patient's progress towards recovery long before there has been time for reparation even under more favorable conditions; so that, being aware of and admitting the evils of prolonged confinement, surgeons are continually letting their patients up too soon. With the mitigation or cessation of painfulness they are set upon their feet again. Hence, relapses are frequent, and perfect recoveries — recoveries with motion and without lameness — are very rare indeed.

Perhaps the following statistics may be of interest and not without value in this connection: —

Leaving out of consideration all cases whose histories, subsequently to their treatment, are unknown or in doubt, I find that there remain ninety-four private cases of hip-joint disease which were under personal observation and continuous treatment from the time they applied until they died or were cured, and whose present condition is now, or was very recently, a matter of personal knowledge, for no case whose ultimate fate is not positively known deserves a moment's consideration in any estimate of the probable value of treatment for the hip-joint. Of the ninety-four cases three died, — two of the disease, and one was run over and killed. Among them there were twenty-four with suppurating joints and discharging abscesses, — nearly all in that condition when first applying. Of these twenty-four with abscesses, two died, — the same as stated above, — and in five the discharge has not yet ceased. Deducting these seven, there remain seventeen fully recovered, or seventy per cent. of the suppurating cases. Three of the seventeen

recovered cases have anchylosis, and fourteen recovered with practicable joints, — the majority with ample, and some with perfect motion. The ratio of motion to anchylosis, in the cases recovering after suppuration, more or less extensive, is as eighty-two to eighteen. In two of the cases still discharging anchylosis is progressing favorably, and in three there is excellent motion, and, except for the slight discharge remaining, they would be among our best cases. The joint motions are nearly perfect, and the joints themselves are apparently well, the present discharge being supported, undoubtedly, as it so often is, by eccentric periosteal excoriations. In such cases nothing so tends towards recovery as the action of the muscles contiguous to such eccentric implantations.

The above enumeration includes all cases of the class previously specified for the nine years preceding November, 1877, but excludes the cases received since that date.