LECTURES

ON THE

DIAGNOSIS AND TREATMENT OF HIP-DISEASE
IN CHILDREN.*Delivered at the Hospital for Sick Children.*

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LECTURE III.

Treatment by the Weight and Pulley.—During this plan of treatment, it is a *sine quâ non* that you provide the child with a separate bed. In any case in which the parents are too poor to buy one, a wooden tray, to be had anywhere for a few shillings, will answer the purpose. Choose a firm and rather thin horsehair or flock mattress, and put the leaf of a table or something of the kind under it to keep its surface level. A feather-bed or a thick mattress soon becomes uneven. Do not be afraid of bed-sores in children who are properly attended to. Except in cases of extreme exhaustion, bed-sores in children are scarcely ever seen. Do not use a common-sized pillow; the child will get his shoulders upon it, and then there will be a tendency for him to slide down to the foot of the bed, and also his trunk will be raised—a position equivalent to flexion of his thigh. The best kind of pillow is one large enough only for the head, and wedge-shaped, so that it brings the head forward and allows the child to see things around him without raising the shoulders. It is useless to apply the weight while the child lies on his side. He must be on his back. There are two means for maintaining this position. 1. An ordinary long splint, with a cross-piece at the foot to keep it from rotating, may be applied to the opposite or *sound* side from the armpit to below the foot. I wish particularly to direct your attention to the practice of using the long splint, not for the affected, but for the sound side. A limb, in hip-disease, as a rule, when you begin to treat it, presents an outline to which you cannot satisfactorily adapt a straight splint. Some surgeons have the splint "interrupted" opposite the joint; but then it fails to give the limb any useful support; and, when the child is lifted, or when he tries to move himself, it is much more likely to wrench the joint than to protect it. On the affected side also, the splint may press on an abscess that is forming, and its bandages may interfere with the circulation; but, on the sound side, it is more effectual in keeping the child at rest, and also, by affording a kind of counter-extension by steadying the trunk and sound limb, favours the action of the weight. 2. To keep the shoulders flat, you may use a chest-band, consisting of a cross-piece of webbing or cloth, with armlets, passed through a strip of strong webbing tightly strained across the surface of the bed beneath the shoulders (see figs. 8 and 9). By these appliances, the child is effectually kept at rest as regards his trunk and sound limb. The chest-band may seem to you too severe a discipline; but, as a matter of fact, children never mind it. It leaves the arms full play, and it is only felt as a restraint when the patient tries to sit up. If it be worked in coloured worsted, the child looks on it as a piece of finery, like a ribbon for the hair. Another means for keeping a child on his back is Thomas's splint, which will be presently described. The best method of fixing the weight is by the common strapping "stirrups". This should be stout and strong. The twilled strapping prepared by Mr. Ewen of Jermyn Street, and the moleskin strapping sold by Messrs. Maw and Son of Aldersgate Street, are both well adapted for the purpose. Cut a strip two inches or two inches and a half wide, and long enough to reach, when doubled, from the middle of the thigh to three or four inches below the sole. Double it on itself and convert its rounded loop into a rectangular one, by fixing into its concavity a piece of wood, shaped like a visiting-card, of the same width as the strapping, and long enough to spread the sides of the loop so that they may not touch the malleoli; run the cord for supporting the weight through a central hole previously bored in the wood and through the stirrup at a corresponding point, and secure it with a knot; then fix the "spreader" in its place by means of a second piece of strapping surrounding it and the stirrup transversely. The stirrup is now ready for use. It is applied so that its ends run up the inner and outer surfaces of the limb to the middle of the thigh—it is better to have the weight act from the thigh rather than from the leg alone—and the strips are then fixed by frequent transverse pieces encircling the limb, the lowest of which should be a clear two inches above the malleoli—if nearer, it may produce swelling of the foot—and over these a

thin flannel or domette bandage is applied. The successive turns of the bandage should be stitched together in three vertical lines down the limb, to prevent their slipping, or they may be fixed by being brushed over with thin paste. It is better to allow the strapping eight or ten hours in which to become firmly settled upon the limb before the weight is suspended from it, otherwise it may gradually slide down. A well applied stirrup will last for two or three months without alteration. There is no better or cheaper form of pulley than a large cotton-reel with deep rims threaded over a carpet-rod, and fixed by some simple means to the framework at the foot of the bed. It is often very useful to support the limb by sandbags, one of which is placed on the outer side from near the axilla to the foot, the other between the legs. Place a small cradle over the foot to protect it from the weight of the bed-clothes; and, in winter, keep the foot warm by wrapping it in cotton-wool or soft flannel. If the child slide down towards the foot of the bed, place a brick or a block of wood of a similar shape between the board and the frame of the bed (fig. 8). This plan is more secure than raising the feet of the bedstead.

The direction in which the weight is made to act is of the greatest importance. This must be in the long axis of the limb in whatever posture the thigh has, in the course of the disease, become fixed upon the trunk. Before the pulley is fixed, the limb—when you have gently straightened the knee—must be carried in any direction that is necessary to remove all anterior curvature of the lumbar spine, and all twisting of the pelvis; that is, you must first remove all compensatory curvature of the spine, and thus place the limb in its true position. To do this, if the spine be curved forward, raise the limb till the spine is flat (fig. 6); if the pelvis be too low on the affected side, abduct the limb;

Fig. 6.

if too high, adduct it, until in either case the two iliac spines are on the same level; then fix the pulley at some convenient point in the line of the long axis of the femur. Observe, when the pulley is thus placed, the force you are using is that of *simple extension*. If, on the other hand, your pulley be at a point not coincident with the axis of the femur, you are not using simple extension, but leverage. Thus, in fig. 7, the femur is a lever of the second order; and *F*, the acetabulum,

Fig. 7.

is its fulcrum; the muscles passing from the spine and pelvis to the femur are the resistance, and may be represented by *w*, and *P* is the power acting on the femur by means of the weight-extension. The force thus applied, though, of course, more gentle in its action, is of the same kind as that used when you forcibly straighten the limb under chloroform, and it is open to the same objection, that it makes a

fulcrum of the acetabulum. In acute disease, if the pulley be placed as in fig. 7, the child's pain will be increased; while, if it be put in a line with the femur, pain is generally at once relieved.

When you have removed the curvature of the spine, the limb will be more or less flexed and generally either abducted or adducted; and, whatever its position may be, in this you must support it with a pillow or with some padded framework. Now, if the limb be simply flexed, the pulley must be raised to the requisite height in the line of the trunk (fig. 6). But, if there be also abduction, the pulley must be carried outwards towards the side of the bed (fig. 8). If the limb be adducted so that

Fig. 8.

it crosses the opposite leg, the pulley must occupy a corresponding position (see fig. 9). Subsequently, as the muscles and other rigid structures yield, the limb will subside into its natural position until it is in full extension and parallel with its fellow. As this change goes on, you must gradually shift the pulley, so that it is kept still in the line of the long axis of the femur, and, at the same time, the height of the pillow supporting the limb must be gradually diminished. The rule for moving the pulley and diminishing the height of the pillow is this. About once a week, while you hold the limb well extended by grasping it above the ankle, so that the articular surfaces are kept apart, direct the nurse to detach the weight and remove the pillow, and then you bring the limb down as far as it will come without arching the spine; and either adduct it or abduct it (carrying it towards its natural position) as far as you can without disturbing the pelvis. You will thus see how much you have gained, and you can have the pulley and the height of the pillow re-adjusted accordingly.

Fig. 9.

In cases, however, in which there is long-standing and considerable adduction—or, in other words, considerable apparent shortening—the deformity will not yield, or will yield very slowly, to simple extension. Then the following plan may be adopted. First, having applied the long splint to the sound side, remove flexion, if it be present, by means of the weight, as already described; then, when the limb can be placed flat on the bed, apply a heavy weight, say five pounds, to the foot in the usual way; place an outside splint on the diseased limb from the sole to the middle of the thigh; fasten three rings to this at different heights along its outer side, and to these rings attach weights and let them hang over the side of the bed (fig. 10). The weights should be about two pounds each. They will generally cause no pain; but, if they

do so in any case, they must be diminished. In the course of three weeks or a month, this plan will remove long-standing adduction, so that the apparent shortening, that perhaps has amounted to an inch and a half or two inches, is corrected.

Fig. 10.

I think, if you have not watched the treatment of distortion following hip-disease by means of the weight and pulley, you would be surprised to see what it will accomplish. Of course, if there be bony ankylosis at the joint, the weight cannot alter the posture of the limb; but, in cases in which the joint is fixed only by fibrous adhesions and contracted muscles, the restoration of the limb to its normal posture is, in the large majority of instances, only a question of time. I have lately seen two cases in which the thigh had been flexed within a right angle with the trunk, in one for more than a year, in the other for nine months; and in both deformity was removed, so that the limb was fully extended in a little over two months. Some of the most striking effects of the weight have been seen in cases in which there was considerable apparent shortening. The plan described above for removing this distortion by lateral weights is very easily carried out, and it requires no apparatus that cannot be had anywhere for a few shillings. It needs, no doubt, careful supervision—what method does not?—but an intelligent mother or nurse can soon learn how to manage it, and it will be enough if you see your patient about twice a week. It can be carried out without pain and with no discomfort to the patient.

When deformity has been removed, and the patient has taken to the habit of recumbency, the long splint and the armlets may, if he can be watched, be removed, and treatment by the weight only be continued. For what period this latter may be required depends on a variety of circumstances: the duration of the disease, its severity, the formation of abscess, etc. Perhaps the best rule is, that the weight should be constantly applied for at least three months after all symptoms have disappeared, and then that the child should, by slow degrees, be advanced to the stage of using crutches. But, for many months—six or nine—or for a year, the weight should be worn at night; so that any tendency there may be to return of distortion may be counteracted. This use of the weight at night is a matter of great importance. If it be neglected, you will find in many cases that, although all active disease has ceased, the limb will, in the course of a few months, become flexed upon the trunk, so that the child walks more and more upon his toe, and with more and more lordosis. In cases of real shortening, before the patient is allowed to walk on the limb, he must have a high boot. This should be made with the front part of the sole very nearly as thick as the heel, so that the child, instead of being made, as is the case when the common "high heeled" boot is used, to walk on his toe—that is, with his leg bent—may bring his foot horizontally to the ground.

The second method of treatment that I must describe is the American. This has for its object to apply extension and counter-extension to the joint, and thus provide for the repair of the disease, while the patient is up and taking exercise. To do this, various instruments—all of them modifications of one originated by Dr. Davis—have been recommended; but I need only refer to two of them—Dr. Sayre's and Dr. Taylor's—which are improvements on the rest. In Sayre's splint (fig. 11), A is a metal plate with which is connected a perineal band; to A is fastened, by a ball-and-socket joint, a steel bar (C D), which runs from just below the crest of the ilium nearly to the knee, on the outer aspect of the limb. This bar consists of two parts running the one within the other—an upper hollow and a lower solid piece; at E is a cogwheel worked with a key, by which D is made either to ascend within or protrude from C; F is a catch for fixing D.

Thus C D can be lengthened or shortened at will. At the lower end of C D is a branch passing over the front of the thigh to the inner aspect of the knee. At G H are two buckles pointing downwards. To prepare the limb for the splint, a piece of strapping is applied longi-

Fig. 11.

tudinally to the outer side of the thigh, and a like piece to the inner side, and both are fixed with a bandage. The lower free ends have a webbing tongue stitched upon them. The splint is now laid along the outer side of the limb, the perineal band is made secure, and the free webbing ends of the two pieces of strapping are turned up over rollers and fastened to the buckles, and extension and counter-extension are produced by protruding D from the canal of C by means of the cog-wheel at E, and maintained by the catch at F.

Taylor's instrument is shown in fig. 12 (next lecture). Both the outside bar and the strapping extend from the hip to the ankle, and thus the apparatus is altogether longer than that of Sayre. The bar terminates above in a very firm pelvic girdle fitted with two perineal bands strong enough to support the weight of the patient "without yielding in the least". Below, the bar ends in a foot-piece. This consists of a horizontal plate about an inch and a half wide, which turns at right angles beneath the sole. A leather strap passing transversely beneath the sole and through apertures at each side of this plate is fastened to buckles, stitched on the free ends of the strapping running up on either side of the limb. As the foot-piece projects below the level of the sole for nearly two inches, "the sound limb should have the same amount added to its length by means of increasing the thickness of the shoe worn on that foot". The instrument should be so adjusted that there is a little space between the foot and the foot-piece; so that, in walking or standing, the weight may not rest on the limb, but the whole of the weight of the body should rest directly on the instrument.

The time at my disposal does not allow me to do more than thus very briefly to describe the principle of these instruments and the method of their construction; and in so short a notice it is not possible to do them justice. But you may find a full account of them in Professor's Sayre's recently published *Lectures on Orthopaedic Surgery* (Churchill, London), or in Dr. Taylor's essay on the *Treatment of Disease of the Hip-joint* (New York). The object at which they aim is undoubtedly most important, and they are constructed with great mechanical skill; yet I confess I have found it extremely difficult to obtain satisfactory results by their use. I suppose the greatest amount to which the surface of the head of the femur can be separated from that of the acetabulum cannot be more than about the tenth of an inch. And it is very difficult to preserve efficient extension and counter-extension within this range; for the parts cannot be acted upon as if they were parallel metal plates to be adjusted by a screw; they must be controlled through the agency of perineal bands and strapping fixed upon the skin, and all these are apt to give when they are subjected to constant traction; and, if they yield, though it be but slightly, they soon, in the aggregate, lose this tenth of an inch of extension which they should maintain, and then the articular surfaces come again into firm contact. Besides, I may refer to what has seemed another difficulty. Both Dr. Sayre and Dr. Taylor allow their patients to move the thigh upon the trunk by bringing it towards flexion, and it has always appeared to me that, if the perineal band be adjusted, according to their direction, when the limb is extended, it will become loose when the limb is flexed. However, I have not had the good fortune to see Dr. Taylor carry out his treatment (though I once saw Professor Sayre apply his splint to a patient in the hospital); but the results published both by him and Professor Sayre are very striking, and are such as all may envy. Still, I cannot help thinking that, with either instrument, extension and counterextension can only be maintained by such an amount of incessant watching as cannot be secured in the usual course of practice; for, so far as I have observed, the perineal band requires readjustment—when the child is

up and about—several times in an hour, and it always grows loose in the course of the night. Again, perineal bands must always be very troublesome appliances in young children, especially in girls.

REMARKS ON OPHTHALMIC THERAPEUTICS AND THE TREATMENT OF THE COM- MONER DISEASES OF THE EYE.

Being Extracts from the Address delivered at the Annual Meeting of the South Wales and Monmouthshire Branch of the British Medical Association at Brecon, July 11th, 1877.

By TALFOURD JONES, M.B. LOND.,

University Medical Scholar; President of the Branch; Physician to the Breconshire Infirmary; etc.

As practitioners of general medicine, we must feel extremely indebted to ophthalmic surgeons for the precise, methodical, and excellent work which they have done during recent years. A complete and exact knowledge of ophthalmology can only be acquired by one who makes up his mind to devote the greater portion of his lifetime to the special study of diseases of the eye; but a general knowledge of this most important subject can, and should, be mastered by all those who practise general medicine, and who necessarily in the country undertake the treatment of ocular diseases. Yet, it is not simply in order to treat skilfully diseases of the eye that we should all earnestly seek to make ourselves proficient in this interesting though difficult branch of medicine and surgery, but, as practitioners of the healing art, it becomes our duty to familiarise ourselves with the means which ophthalmic surgeons have placed at our disposal for the diagnosis and study of so many general diseases.

But, it is not to ophthalmic surgeons only that we, as physicians and surgeons, are indebted, for we are equally indebted to those physicians whose zeal and love for medicine led them to make early use of the ophthalmoscope for the more complete study and diagnosis of diseases of the nervous system, and who have by their industry and genius placed at our disposal information of surpassing value.

Up to very recent times, it was considered impossible to see into the interior of the eye, nor was it supposed that any instrument could ever be discovered whereby such a view could be obtained, for it was long held that the pigment of the choroid absorbed all the light which entered the eye, and that, therefore, a luminous reflex could not be obtained. We, however, of this generation possess in the ophthalmoscope an instrument which enables those who are skilled in its use to see at a glance to the innermost depths of the eye, to view with ease the veins and arteries of the retina, and to detect all those pathological changes in them which disease induces.

Most of you, it is to be hoped, have read the interesting address which Dr. Hughlings Jackson delivered before the Medical Society of London on Ophthalmology in its Relation to General Medicine, and which has recently been published in our JOURNAL. He shows in vivid words how we all may, by well-directed efforts and patient study of ophthalmology, make ourselves not simply oculists, but abler and wiser physicians.

[Dr. Talfourd Jones here quoted and summarised several paragraphs from Dr. Hughlings Jackson's address, lately published in the JOURNAL; referring also to the labours of Dr. Clifford Allbutt, Mr. Jonathan Hutchinson, Dr. John Ogle, Mr. Brudenell Carter, and others.]

I would urge upon you the advisability of using more generally the ophthalmoscope in the investigation of cerebral, arterial, and renal disease. Without its aid, many important pathological conditions must escape our notice; and it is clearly the duty of those who undertake the treatment of disease to make themselves familiar with the use of so valuable an instrument. Without its aid, what can we know of such diseases as optic neuritis, simple atrophy of the optic nerve, embolism of the retinal arteries, retinal hæmorrhages, and the characteristic retinal changes in Bright's disease, or, indeed, any other disease of the fundus oculi? and yet those pathological conditions are of extreme interest to the general practitioner of medicine.