CLINICAL LECTURE

ON

LATERAL CURVATURE OF THE SPINE.

Delivered at University College Hospital.

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BEFORE bringing into the theatre a patient suffering from lateral curvature of the spine, I propose to say a few words on the disease and its causes, and to illustrate them on the back of a healthy young patient. In the first place, cases of lateral curvature of the spine are much more common in private than in hospital practice, and among the well-to-do rather than among the poorer classes. The complaint is much more frequent among females than males, for reasons which I will give presently; and especially common among young ladies from fourteen to twenty, whose dressmaker or dancing-mistress is the first to notice that one shoulder is "growing out". And yet we get cases from time to time in hospital practice, due either to old hip-disease, as in the patient coming here to-day, or from young persons carrying heavy weights habitually on one arm, as in errand-boys and nurse-girls.

I need hardly remind you, I hope, that the vertebral column is, owing to its construction, both elastic and flexible, and that it is maintained erect and at right angles to the pelvis by double sets of muscles, which in health exactly counterbalance one another. In this healthy girl whom I place before you, the legs are of the same length, the pelvis is consequently horizontal, and the spine vertical to it and straight. Now, I put a book beneath her right foot, and immediately the right side of the pelvis is correspondingly raised, and I make a little hollow in the right loin and curve the lumbar spine to the left. If that condition were maintained long enough, we should get a "compensating curve", as it is called, in the dorsal region (fig. 1)—*i.e.*, the weight of the head and trunk being thrown a little out of the perpendicular, an involuntary effort is made to restore the equilibrium by throwing the shoulder to the opposite side; and you can easily understand that if this effort be perpetually going on, deformity will eventually result. The same thing occurs if I take away the book and get the girl to "stand at ease"—*i.e.*, to throw her left foot forward with the knee bent, for you will see at once that the left side of the pelvis is lowered and the lumbar spine curved to that side. Nobody stands habitually at "attention" with both

Fig. 1.

knees straight; but as we shift from one leg to the other every few minutes, we do our spines no harm. The same induced curvature of the lumbar spine can be shown if I make the girl sit down, and then raise one side of the seat more than the other.

You will see, now, how important it is in every case of spinal curvature to ascertain whether the pelvis is horizontal and the legs of the same length. This can be done readily enough, as in the patient before us, without any undue exposure of the person. But lateral curvature begins in another way, and in patients whose lower limbs are quite symmetrical. In weakly girls who have outgrown their strength, the muscles of the back are not strong enough to maintain the spine erect under the weight of the head and thorax, and the spine tends to assume curves both in the dorsal and the lumbar regions; for though we conventionally speak of "compensating" curves as if they followed one another, they are really produced together. Now, why should the dorsal curve be almost invariably to the right and the lumbar to the left, and not the converse? The reason is, no doubt, that the great majority of mankind are right-handed, and that the right limb, being more developed, is heavier, and the muscles which support it stronger, than on the left side. But, in addition to this, we must take into account the peculiar type of respiration in the female—that it is much more thoracic than

in males, and particularly that the upper ribs move much more freely, the breasts of women rising and falling with each respiration in a way never seen in men. Now the important inspiratory muscle, the serratus magnus, takes its fixed point from the scapula and is inserted into the upper ribs, and must draw them upwards and backwards equally in health, but to one side more than the other, if from any cause the muscles are unequally developed, or if, as shown to you by Dr. Sayre last year, the pressure of the head and thorax upon a weakly supported spine tends directly to produce a rotation of the vertebrae. Undoubtedly the action of a non-counterbalanced serratus is to produce rotation of the vertebrae also, for the ribs act as long levers attached to their respective vertebrae, and hence one of the earliest changes in lateral curvature is a rotation of the vertebrae, so that the transverse processes on one side become unduly prominent by the sides of the spinous processes. Of course, the ribs, moving with the vertebrae, must be thrown back on the right side, and by their angles thrust out the scapula, thus causing the "out-growing shoulder"; and at the same

Fig. 2.

time, the left ribs being advanced, push forward the breast. Let me illustrate this by means of a diagram (fig. 2), and let me also warn you not to mistake a healthy breast thus thrust forward for one affected with disease, since you may be consulted for that symptom alone by a patient unaware of her deformity.

I will now dismiss the healthy subject, and bring in the patient suffering from actual curvature. This young woman, who is now aged 20, suffered from hip-disease on the left side at eight years old, and the result has been, as commonly happens, that the limb on that side has not kept pace with its fellow in growth; and as she stands now in slippers, you

can see that the left side of the pelvis drops, and that there is a well marked lumbar curve to the left, with a so-called compensating curve of the ribs and dorsal spine to the right. Notice particularly how the right hip appears unduly prominent, and how the right scapula is thrust out. Now I will proceed to raise the left foot, so as to bring the pelvis straight, and you see at once a diminution in the lumbar curve, which of course cannot be rectified in a day; still less can the dorsal curve and rotation be put right without assistance, and that I propose to give by applying a plaster-of-Paris jacket after Sayre's method. Whilst the house-surgeon is making the necessary preparations for this, let me say a few words about other modes of treatment.

In cases where the curves are recent and slight and the patient young and flexible, a great deal can be done by employing the methods which I demonstrated at the beginning of this lecture on a healthy back with the view of producing curves for demonstration—only of course reversing the method. Thus with the ordinary form of curvature, where the dorsal curve is to the right and the lumbar to the left, it is obvious that we must raise the left side of the pelvis in order to straighten the back. Half an inch, gradually increased to an inch, added to the left boot will do a good deal, and the regular use of the sloping seat of Mr. Barwell one to two inches higher on the left side than the right, will do more to relieve the deformity, provided the muscles are not over-fatigued, and the patient has a pair of well-made stays to take off some of the weight of the trunk. Gymnastic exercises and calisthenics also are useful in strengthening the muscles, and particularly the action of climbing, which closely resembles the "self-suspension" recommended by Sayre, of which I shall speak directly, and which I have found to be an excellent method for cases not severe enough to require a plaster-of-Paris jacket.

In more severe cases, we have until recently had to rely upon some form of "spinal support"; and I show you here one or two specimens, only to warn you against employing them. I have tried them, both in hospital and private, and I must say I have never seen any good result; and I have watched the progress of cases in the hands of others more experienced than myself with as little benefit. The principle of all is the same: a steel pelvic-band with a crutch on each side is supposed to hold the trunk firmly, whilst a pad is worked by a lever with cog-wheels against the dorsal projection on one side and the lumbar curve on the other. Theoretically this is very satisfactory, for if with my two hands I grasp this patient on each side, you can see that I might in time push her back straight. But then you must remember that I am able to exercise a combination of complicated movements which no machinery can imitate, and that I occupy the enormous vantage ground

of standing apart from the patient, with my base of support on the floor. It is conceivable that if a spinal support could be made to be fixed in the ground and yet grasp the patient, it might effect some good; but as the modern machines are made to take the pelvis of the patient as their supposed fixed point, they are of no service, since they slip up and down as the screws are worked and as the patient's body moves. The proof of this is seen in one of the supports I show you, in which, in order if possible to counteract this "riding" tendency, an iron has been added, passing down the leg to a socket in the boot. Not only do these machines fail to do good, but they do positive harm by preventing the proper exercise of muscles; and yet they are extensively applied, and applied, too, to my certain knowledge, to cases where no apparatus at all could be required, the patient's back having nothing the matter with it!

And now we will suspend our patient, that you may see the effect of taking off the weight of the head and thorax, and of hanging the weight of the pelvis and lower limbs on the curved spine. Here we employ Sayre's triangle and slings; but for the patient's own use in exercising herself, I have had a much cheaper and less formidable set of pulleys made, which I have found to work well in private cases. It is simply a set of double pulleys, with a screw which can be fastened into the top of any ordinary bed-room doorway or other convenient beam. It has the same head-piece as Sayre's, but no axillary straps or crossbar, which, indeed, are unnecessary for "self-suspension". A young lady can take this about with her when visiting friends without attracting attention, which could hardly be the case with a folding tripod.

We will now put on the knitted jersey with the "dinner-pad" over the abdomen and cotton-wool over the breasts, and apply the plaster-of-Paris bandage, strengthening it on the projecting side with strips of tin. While this is being done, I will give the mother of the patient directions as to the after-treatment which must be carried out. In the first place, we must raise the left side of the pelvis by adding half an inch to the heel of the left foot, which has already concealed in it a heel of three-quarters of an inch, which, however, is not sufficient. Next the patient must learn to exercise herself three times a day by adapting the head-sling and then, with the hands well over the head, suspending herself until only the toes touch the ground. While in this position, she is to take three deep breaths or inspirations slowly, and then lower herself again; and this, after a minute or two's rest, is to be repeated three times. In the intervals, she is to walk without fatiguing herself and to lie down for half an hour after each exercise. She has a comfortable home and is well fed, and, at present at least, requires no special medicine. In a fortnight's time, gentlemen, this patient will come before you again, and we shall then be able to judge of the amount of improvement which is likely to take place.

CHRYSOPHANIC ACID OINTMENT IN PSORIASIS.—Dr. Neumann of Vienna thus endorses (*Wiener Mediz. Presse*, No. 14-16, 1878) Mr. Balmanno Squire's treatment of psoriasis by an ointment of chrysophanic acid, as first communicated by Mr. Squire in this country at the latter end of 1876. After giving due credit to Mr. Squire, and to the other English observers who followed him in this research, the professor winds up his paper with the following summary. 1. Chrysophanic acid derived from Goa powder is an excellent remedy for herpes tonsurans, pityriasis versicolor, and psoriasis vulgaris. 2. Psoriasis in its earlier stages begins to disappear after a few applications of the drug, and in a far more unequivocal manner than under any other remedy that has ever yet been used against psoriasis. 3. Even inveterate forms of the disease can be abolished by means of chrysophanic acid, and it is quite the exception to find them oppose any protracted resistance to it. 4. Chrysophanic acid is a perfectly painless application to the diseased skin. The morbid phenomena occasioned by it on the healthy skin result apparently from the admixture of resinous matter with the acid. 5. As a result of this mode of treatment, psoriasis belongs no more to those skin-diseases which in so high a degree are a source of misery to the patient, and it has now become an easy matter to cure relapses. Every patient with psoriasis that I have as yet treated by this means gives the palm without hesitation to this method of treatment in preference to all others. In any case, this at the least is emphatically true; namely, that the therapeutics of skin-diseases have for the last ten years been enriched by but few remedies which have been crowned by so eminent a success as the one in question. 6. There are other skin-diseases, also, which are curable by chrysophanic acid. 7. He expresses a hope that this method may be examined by other observers; and he does not doubt that it will soon permanently assume its due rank amongst the treasures of therapeutics.

REMARKS

ON

THE MINUTE ANATOMY OF THE SMALL RED GRANULAR KIDNEY.

By GEORGE JOHNSON, M.D., F.R.S.,

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In the March number of the *London Medical Record*, Dr. Saundby has given a clear and complete *résumé* of an able and interesting lecture by M. Charcot on what he designates "epithelial visceral cirrhoses". The lecture which Dr. Saundby has analysed is published in *Le Progrès Médical* of December 22nd, 1877, and February 2nd, 1878. M. Charcot's observations relate to the lung, the liver, and the kidney; and he shows that analogous changes occur in each of these organs. In his description of the structural changes in the small red kidney, he entirely confirms the account which I first gave of those changes in the thirtieth volume of the *Medico-Chirurgical Transactions*. Histologically, he says, there are two prominent facts: 1. The epithelium of the convoluted tubes undergoes granular degeneration, and finally disappears; 2. The connective tissue which surrounds and sustains the tubes is developed in excess. But he requests special attention to one particular: "At a given time, the dark granular epithelium which in the normal state lines the convoluted tubes is replaced by a cuboid epithelium resembling that of the collecting tubes." "This change", he says, "has been described by all histologists who have been engaged with the subject: George Johnson, Cornil, Ranvier, Kelsch, etc. It seems to be a fundamental characteristic of the small red kidney, and, if met with in other forms, is so only accidentally and in places."

After describing analogous changes in the lung and the liver, and stating that the changes found in these different organs are, (1) modifications of the granular epithelium, (2) modifications of the connective tissue-wall supporting this epithelium, he inquires which of these two is primary, and expresses his belief that it is the epithelial change; and therefore he calls the structural change "epithelial cirrhosis". Amongst other arguments in favour of this view, he says there is much reason to believe that epithelial tissues have an autonomous existence independent of subjacent structures, or at least without direct participation with the connective tissue in which they rest, except "for the supply of interstitial liquid: a necessary influence for the maintenance of vitality in all the tissues".

It is satisfactory to me to find that my views as to the relation of the epithelial and the interstitial changes which are found in the small red kidney are thus confirmed by so able an observer and so eminent a pathologist as M. Charcot.

In the lecture referred to, Charcot makes no reference to the state of the renal arterioles; but MM. Cornil and Ranvier, in their *Manuel d'Histologie Pathologique* (part 3), not only give the same description and illustration of the epithelial changes in the kidney, but they give drawings of the thickened arterioles which are identical with those which I first published in the thirty-third volume of the *Medico-Chirurgical Transactions*. This thickening of the arterial walls, however, they look upon as the result, not of a physiological hypertrophy, but of a chronic arteritis.

All the characteristic specimens of renal arterioles in the form of disease under consideration show an inner longitudinal and an outer circular layer of fibres of nearly equal thickness. I formerly supposed that the inner longitudinal as well as the outer circular layer was muscular; but I am now convinced that the inner is the thickened elastic coat; and, since this thickened inner layer in a hypertrophied renal arteriole has precisely the same structural appearance and arrangement as the elastic layer in the larger but still microscopic arteries, I cannot but look upon it as being thickened by a true hypertrophy or overgrowth of the normal tissue. And a probable explanation of this hypertrophy of the elastic inner tunic of the arterioles is to be found in the need for resisting the tendency to elongation of the arteries by the distending force of the hypertrophied left ventricle. The tortuosity of many of the hypertrophied renal arterioles shows that they have become more or less elongated by the injecting force of the heart, notwithstanding the increased thickness and strength of their longitudinal elastic tunic; and it can scarcely be doubted that, but for the