Lectures

ON

ORTHOPÆDIC SURGERY.

BY

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LECTURE IV.

ON CURVATURES OF THE SPINE.

(Continued.)

Scoliosis.

SCOLIOSIS, or Lateral Curvature of the Spine, is that distortion in which the vertebræ deviate, as the term implies, in a lateral direction away from the mesial line of the trunk.

This affection may be divided into two stages, or periods; namely, first, *incipient curvature*; and secondly, *confirmed lateral curvature*.

It is important that these terms should be rightly understood; and I would, therefore, define them thus. Incipient curvature is removable in the horizontal position, either by slight lateral pressure or even by throwing certain muscles into action; while a confirmed curve requires long-continued mechanical means to effect the same object.

The *causes of scoliosis* are various. They are debility, general or local, rachitis, thoracic disease, obliquity of the pelvis, etc. Debility is, without doubt, the most common cause of this affection. It shows itself in various ways. Thus, muscular debility during convalescence, and weakness of the ligaments during too rapid growth, are the most frequent causes of this common affection. Let us take, for instance, the case of a child whose health has been rendered delicate from whatever cause. If it be treated in the same manner as a stronger companion, some irregularity of form will probably develop itself; but the particular form of distortion will depend mainly on the habits of the child. For instance, if the child stand or walk much, it is probable that the internal lateral ligament of the knee-joint will yield, and give rise to genu valgum; and it is probable that this distortion will be followed by yielding of the ligaments of the ankle-joint, and of those in the sole of the foot—valgus. And let us suppose, moreover, that, in consequence of resting too much on one leg, as is very common with such children, the ligaments of that extremity have yielded more than those of the other. Virtually, that leg is shorter than the other; and, therefore, both feet resting on the ground, the pelvis necessarily becomes oblique to accommodate itself to the difference in length of the extremities. But an oblique pelvis must give rise to spinal curvature, as will be explained farther on. Fig. 6 was drawn from such a case.

The child was 12 years of age. She habitually stood on the right leg. The prominent features of the case may thus be described:—genu valgum much more on the right than on the left side; right side of pelvis half an inch lower than the left; right

lumbar curve, left dorsal curve; right shoulder three-fourths of an inch lower than the left.

Fig. 6.

Fig. 7.

I may here mention, that all the figures which I shall have to use, have been taken from drawings

made by Mr. Bagg with the camera lucida; and that they have in no instance been exaggerated or modified; but that they are true, and exemplify well the nature of the several affections which they are intended to represent.

Fig. 7 was taken from a young person, 16 years of age, who, from overgrowth, had become feeble. The spinal distortion had been four years in forming. She habitually stood on the right leg.

Those who are feeble, whether from overgrowth or during convalescence, constantly change their position while standing; so that they rest for a short time only in one position and then change it for another—from both feet to one foot, for instance, and back again. And it is found that it is habitually the right foot in some cases, and in others the left foot, which has, in this way, to bear very frequently almost the entire weight of the body, until, at length, it becomes more natural to stand on one leg only, than fairly on both. It becomes so natural to do this, that it is done unconsciously; and until it is pointed out to her, the patient is frequently not aware of the habit. It was so in the case from which Fig. 7 was taken. She denied it until it was pointed out to her three times in about as many minutes.

It may be said that debility alone will not cause a spinal curve; but that there must be superadded bad habits of standing or sitting, which shall occasion obliquity to the pelvis and a primary lumbar

Fig. 8.

curve. These habits to which I have alluded, depend on debility, however; and, therefore, it is right to speak of debility as the cause of these distortions. But just as cyphosis is induced by debility, so debility will induce scoliosis. It may commence as a dorsal curve, as was the case with the patient from

whom the preceding figure was taken (Fig. 8), and this is a form of curvature which commonly begins during convalescence; and commencing as a dorsal curve, it shows that it does not depend on obliquity of the pelvis nor on any affection of the lower extremities.

Every distortion is produced by a special cause; and it only requires attention to discover the cause. Scoliosis is seldom hereditary; when it is hereditary, it is due to rachitis, or to malformation of the spinal column itself, or to nervous irritation.

Paralysis of one side of the trunk always gives rise to lateral curvature of the spine; the healthy muscles drawing the spinal column away from the mesial line. And the length of the curve will depend on the paralysis; it may be a single curve, all the muscles of one side being paralysed; or it may occupy a part of the column only. After amputation at the shoulder, the latissimus dorsi, etc., become useless, and, therefore, atrophic; and, in consequence, the opponent muscles exercise undue power on the spinal column, and curve it in the direction of their own force. Such had occurred in the case from which Fig. 9 was taken. In this

Fig. 9.

instance, however, the muscles were very powerful, and produced consequently more than the usual effect.

It has already been said that the particular form of distortion depends on the habits of the individual. The following figure was taken from a delicate young girl, 16 years of age, who habitually carried a child on the left arm. This gave rise to a left dorsal curve, as is shown in Fig. 10; and Fig. 11 shows the reverse of this distortion. Here, in an equally

weak condition, the right arm was used to carry the child.

And whether debility be local or general—whether

Fig. 10.

Fig. 11.

it be induced by impaired health or by diminished power of the muscles of the back, for instance—curvature may be induced equally, when the conditions are such as shall give rise to it.

It is probably well known that the muscles of the back of those who wear stays are not red and firm, but that they are, for the most part, pale and weak, and frequently atrophic and indistinct. The want of development which is thus occasioned conduces notably to the formation of lateral curvature of the spine; and, consequently, in those countries where stays are worn, and especially in the stay-wearing class, spinal curvatures are frequent; whereas, in the countries and communities where these are not worn, spinal curvature is much less frequent. Dr. John Gregory has, however, almost exhausted this part of the subject.

It will, perhaps, be said that debility of the muscles of the trunk being induced equally on both sides, there is no reason why lateral curvature of the spine should follow. It should be remembered, however, that in its normal condition the spinal column deviates slightly from the perpendicular line of the trunk. Even at birth this deviation is frequently observed; but later it becomes more marked, as the right or the left hand are habitually used; the employment of the muscles of one side or the other being sufficient to determine the mode of deviation. And it is only because those who have constantly worn stays are, for the most part, exempt from manual labour, that confirmed lateral curvature is not much more frequently met with in this class than is at present the case. The effort to hold the spine erect is great in those who have discontinued the use of stays, and in these spinal curvature is readily induced.

Also, through the use chiefly of one arm, certain trades very commonly give rise to lateral curvature of the spine. Hence, tailors, shoemakers, compositors, dressmakers, embroiderers, needlewomen, and others, are especially prone to this distortion. But, perhaps, nurses who always carry the child on the same arm, suffer more frequently from this distortion than any other of these classes.

Again, spasmodic action of the muscles of the back, neck, and shoulder, occasionally gives rise to scoliosis. This is very rarely found to exist at birth, but it is occasionally met with, together with other manifestations of morbid action.

In the anencephalous and the hemicephalous infant, every variety of distortion of trunk and limb is to be found. And in the same way, distortions are seen, together with hydrocephalus and hydro-rachis. Irritation is, however, for the most part, much more limited in extent; and thus a set of muscles only may be retracted—as, for instances, in torticollis, talipes, strabismus, etc. These and other forms of muscular retraction exist, both as congenital and non-congenital distortions; they are each induced by a like cause, and they differ only in degree and form.

When the muscles of one side of the back are alone affected, scoliosis results; but when both sides are affected, lordosis is produced. Congenital curvatures are sometimes excessive in degree; so that the trunk may be reduced to two-thirds of its normal height. Fig. 12 is taken from one of the most remarkable cases of spasm that I remember to have witnessed. In this instance, there were torticollis and

scoliosis to so great an extent, that it was difficult, and even impossible during more than the shortest period, for the patient to remain upright.

Fig. 12.

After some duration of spasmodic action, loss of power, partial or complete, may ensue.

Obliquity of the pelvis, however induced, whether by hip-joint disease, by rachitic curves of the tibia or femur, by genu valgum, or other cause, is a very common occasion of lateral curvature of the spine.

WISDOM AND KNOWLEDGE. "With all becoming deference," says Dr. Latham, "to those who so loudly trumpet forth the praises of knowledge, and fright the trembling student with a portentous array of the wonderful things he has to learn, I would venture to crave some little regard for what is not so much as named by them, but what is pre-eminently more important than knowledge itself. I mean wisdom, as a thing distinct from knowledge, but not opposed to it; requiring, indeed, knowledge to work upon, but taking care to proportion that knowledge to the real end which itself (wisdom) has in view. I marvel that this wisdom is not enumerated among the ingredients of the physician's character, since it is conspicuously the chief of all." "If we content ourselves," says Harvey, "with the observations of others, the sprightly edge of our own wit will languish, and we extinguish the lamp which they lighted to our hands. It is those who follow nature's conduct with their own eyes (sometimes through a perplexed yet faithful tract) who attain the highest pitch of truth." "Let us blush," he observes, "in this so ample and wonderful field of nature, where performance still exceeds what is promised, to credit other men's traditions only. Nature herself must be our adviser. The path she chalks must be our walk. While we confer with our own eyes, and take our rise from meaner things to higher, we shall at length be received into her closet secrets. For nature being divine and perfect, is always consonant to herself."

Original Communications.

ADDITIONAL OBSERVATIONS ON TRANSPOSITION OF THE GREAT VESSELS OF THE HEART.

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IN the current volume of the *Medico-Chirurgical Transactions*, a case of transposition of the great vessels of the heart is detailed by me, which was associated with simple patency of the foramen ovale. This case is, moreover, compared with the others on record, three in number.

In these four cases, were it not that some interchange of blood must have taken place through the foramen ovale, two circulating systems, perfectly distinct, would have existed. The right, or aortic system, would have constantly circulated black blood through all the organs connected with it, the muscular tissue of the heart inclusive; and the left or pulmonic system would have as constantly circulated oxygenated blood through the lungs. Indeed, even with a patent foramen ovale, the actual state of the circulation must have been nearly as described, so far as regards the systemic vessels. But, as Meyer* has pointed out, there are mechanical causes for an easy transit of blood from the right to the left auricle. The blood from the left or pulmonic heart, while circulating through the lungs, receiving no substantial additions, would have exhibited a constant tendency to concentration from loss of its watery portion by pulmonary exhalation. The absolute quantity consequently transmitted to the left auricle would have been a constantly decreasing one, and inadequate to the physiological distension of the chamber. On the other hand, the blood of the caval system, constantly receiving substantial addition from its tributaries, would exhibit as constant a tendency to repletion of the right auricle. Hence the necessary result would be, that any surcharge of venous blood would enter the left auricle through the patulous foramen ovale to restore the equilibrium. That this result did follow in the author's case is probable from the increased thickness of the walls of the right auricle.† It would, he imagines, be greatly more difficult to explain the manner in which oxygenated blood could pass from the left into the right auricle.‡ But that such passage was effected, we must admit. Such also seems to have been the opinion of most of the observers of the recorded cases. After carefully considering the whole question, the author is unable to give a satisfactory answer to the following question: How is the absence of cyanosis during the first three months, and its comparatively sudden supervention at the close of that period, to be explained?§

There are no data from which to infer the actual period of closure of the arterial duct.|| Even if there

* Virchow, *Archiv.* B. 12, 4tes-5tes Heft, p. 371.

† Upon this point, Cruveilhier, *Anat. Path.*, t. ii, pp. 477-84, makes the following statement. In hearts presenting no other complication than simple though ample communication between the auricles, the following changes are observed: general enlargement of the right cavities of the heart and dilatation of the pulmonary artery and its branches. The left cavities stand in striking antithesis to those of the right side, being below the average size.

‡ For arguments upon this matter, consult particularly Louis, *Research. Anat. Path.*, p. 337; and Allan Burns, *Observations on Diseases of the Heart*, p. 15.

§ For some interesting examples of malformation shewing the length of time prior to the supervention of cyanosis, see Naumann, *Klinik*, B. 2, s. 321 *et seq.*; also, Meckel, *Path. Anat.*, B. 1, s. 411; and Louis, *op. cit.*, p. 340.

|| For the most detailed accounts of the period of closure, see Haller, *Element. Physiol.*, t. viii, p. 10; and Billard, *Mal. des Enfants*, pp. 486-94.