

EDITORIAL ARTICLES.

THE TREATMENT OF SCOLIOSIS BY MEANS OF MASSAGE.

The results obtained from the employment of massage in carefully selected cases of lateral curvature of the spine seem to have been so successful that they deserve more than a passing notice. Dr. Landerer's paper on this subject, together with the discussion of the same at the Congress of the German Society for Surgeons,¹ are worthy of our consideration. Our author regards habitual scoliosis as that arising from superincumbent weight as genu valgum sometimes does, the weight pressing bones and joints in wrong directions and ultimately causing anomalous growth. It is in the earlier stages of this form of scoliosis that he has found massage to speedily bring about recovery, and in the later stages where the deformity has become fixed, intercostal neuralgia and painful tension of the muscles are relieved, and the patient made comfortable by the same means. This form of scoliosis is to be kept separate from the static, rheumatic, traumatic, emphysematic and other kinds, in which it would be well to include that arising from disturbance in the central nervous system.

The production of the natural curves of the spinal column is clearly explained. In early childhood the spinal column is straight. The normal S curve arises from the combined effect of gravity and muscular action, the former alone would cause a simple backward curve, a total cyphosis; the latter modifies this and forces it into a serpentine curve. The action of both is to shorten the spinal column. While our observation would agree with that of the author, that marked serpentine curves, especially deep lordoses in the lumbar regions are frequently found in those of great muscular strength and in stout people of me-

¹Deutsche Zeitschrift f. Chirurgie. Band XXIII, Heft. 5 und 6.
Deutsche Med. Zeitung. No. 32, p. 539.

dium stature, we would beg to differ from him in his statement that those who are tall and slim spare their muscles by throwing the centre of gravity of the upper part of their body as far back as possible. More often the latter stoop or are round-shouldered, and when they maintain an erect attitude the absence of marked curves may be owing to the muscles not being sufficiently strong to curve and shorten the spinal column.

The upper and lower extremities of the cervical portion of the spinal column are approximated by means of the muscles at the back of the neck, the contraction of which changes the former convex backward curve of infancy to a concavity. This result is aided by the effort to maintain the centre of gravity, for the middle and lower parts of the cervical region carry the most of the weight of the chest. The thoracic organs and even part of the weight of the abdominal organs are suspended from the first and second ribs and from the region of the sternum to which these are attached, and these again are held by means of the scaleni muscles and by them raised during inspiration, so that the weight of the thorax is transferred to the middle and lower cervical vertebræ where these muscles are attached.

As the dorsal region of the spinal column has but little strain upon it in either direction it remains convex posteriorly as in infancy. But it is otherwise with the lumbar region which becomes convex anteriorly owing to the action of the large muscles on its posterior aspect which changes the previous backward convexity into a concavity. The lumbar region carries the major part of the weight of the intestines; it is here that the mesentery is attached and also the psoas muscles. These muscles, when the thighs are fixed as in standing and still more in assuming the erect position, make a downward pull upon the lumbar vertebræ in the same manner as the scaleni muscles do upon the cervical portion, thus necessitating a strong counterbalancing action from the muscles on the posterior aspect.

The explanation of lateral curvature is not so easy. Slight lateral deviations are frequently found in otherwise well formed people, and according to our author it is not agreed whether this should be called physiological scoliosis or not. We would at once anticipate his con-

clusion by inferring that this gives no trouble so long as the muscles are strong and active, and that therefore measures to prevent or restore their strength and activity should be employed. Amongst classical statues in the Louvre and British Museum Dr. Landerer has not been able to find any examples of the physiological scoliosis. The spinal column being freely balanced perpendicularly upon the pelvis and thus held by the muscles on each side of it, as a freely balanced mast would be by ropes, it follows that when deviation occurred to one side or to the other it must be on account of muscular relaxation, as the mast would deviate if one of the ropes were slack. Increased weight in the perpendicular direction alone does not cause lateral deviation. The effect of gravity upon superincumbent or suspended weight will not produce scoliosis so long as the muscular structure is normal.

In Swabia, where the home of our author is, he tells us that women and girls carry heavy loads upon their heads up high mountains, but in spite of this scoliosis amongst the laboring classes is seldom met with. On the contrary, very prettily formed figures are almost exclusively found due in great part to this exercise. The maidens of Capri also carry heavy weights upon their heads and are remarkable for their faultless development. The muscles are thus made powerful to oppose strong lateral resistance.

In incipient scoliosis the spinal column is exceedingly flexible and this great mobility should be regarded as the first sign of lateral curvature, especially when accompanied with flat back,

Autopsy of scoliotics reveals atrophy and fatty degeneration of the muscles of the back, especially of the concave side. We would have supposed that it would be greater upon the convex side where the relaxation would be.

We are all more or less critical in observing any slight obliquity of the shoulders and lateral deviation of the spinal column, but somewhat indifferent towards the antero-posterior direction of the median curve. Only in the most recent ladies' fashions does our author find that a well developed median curve is necessary and that a deep concavity in the lumbar region—lordosis—is pretty. The latter is formed artificially by the bustle or *tournure*.

In health the antagonistic muscles keep the vertebræ at proper distances from each other; If there be muscular weakness they will sink down upon one another, and in sitting or standing if the muscles act obliquely the spinal column will deviate from its natural position and the vertebræ will be pressed together causing disturbances of their circulation and nutrition until they finally become deformed. In brief, *for the preservation of the spinal column in a natural position healthy muscles are necessary. Habitual scoliosis arises from superincumbent weight, the original cause of which is weakness of the muscles and therefore the treatment has to be directed to them.*

The results of treatment proved to our author that his views were correct. Massage goes further than gymnastics, and what these accomplish slowly massage does in a direct manner by the hands of the surgeon. With cases of scoliosis in the first stage which permanently increased in a few months, the children felt stronger and steadier in the back and held themselves more erectly even after a few *seances*. Though the immediate effect of massage was quite evident, yet part of the improvement disappeared within a short time, but the gain gradually became lasting. The method employed by Dr. Landerer is the following: The child is laid upon the abdomen, the trunk bare to the lower half of the crests of the ilia, the arms stretched forwards. The extensors on both sides of the back are percussed with the balls of the little fingers from their origin on the pelvis upwards to the neck; at first gently, then more vigorously. The concave side is percussed more strongly than the convex. The muscles on the side of the trunk so far as they are connected with the spinal column come in for a share of the same. Then the extensors of the trunk are stroked with the fingers held in a perpendicular manner.

We do not see why percussion should be used more energetically on the concave side, unless it be carried to an extreme degree so as to tire out the contracted muscles and thus cause them to relax. Percussion has much the same effect as faradization, and can be used in moderation to stimulate muscular contractility. Our method of percussion in such cases differs somewhat from our author's, for seeing that lateral curvature may not only be favored, but actually produced

in those predisposed thereto by persistently sleeping on one side with high pillows under the head, a great part of the treatment should consist in having the patient lie upon the opposite side so as to reverse the curves. And it is better that most of the massage should be administered with the patient in this position, for massage helps to relax contracted muscles when they are stretched, and it stimulates the contractility of relaxed muscles. The insertion of muscles implies their attachment to the more movable parts, and as their returning circulation almost always follows the course from their insertion to their origin, it would seem much better to proceed with the massage from the neck to the pelvis. Deep manipulation, rapid pinching and rolling of the muscles have much greater influence in stimulating their nutrition and contractility than the stroking of our author which acts more upon the superficial circulation.

Dr. Landerer next uses manœuvres which act more especially upon the skeleton, the spinal column and the framework of the chest—the *redressement*. These resemble the rotation and torsion movements which have hitherto played an important rôle in the treatment of scoliosis. After this the spinous processes are acted upon by stroking from behind upwards, and by pushing them directly towards the concave side so as to equalize the curves. The immediate effect of all this is quite perceptible. Then the depressed parts of the thorax are raised by one hand gliding from the anterior aspect of the chest backwards, raising the concave side, whilst the other presses down the projecting parts on the convex side by stroking with pressure from the spinal column forwards around the chest, at the same time pressing downwards the prominent side, and thus literally remodelling the youngster. Prominences elsewhere, as under the scapula, receive special pressure. Sometimes these operations can be done better while the patient stands or bends forwards. Precise rules cannot be given as no case of scoliosis exactly resembles another. A well-schooled anatomical eye, therapeutical instinct, inclination to treat such cases, together with experience, will lead to accurate treatment and good results.

For special exercise of the extensors of the back the patient is

placed and fixed upon the anterior aspect of the legs on a table, the body projecting beyond the edge and sufficiently supported. Then the patient elevates the trunk from the horizontal position backwards to a right angle, if possible, by energetic contraction of the extensors. We think the patient should often be assisted in elevating the trunk.

To wind up the *seance* Landerer allows the patients to suspend themselves five or ten times by means of Sayre's apparatus, the hand corresponding to the higher shoulder should then be the lower. When treatment has been continued for a few weeks active exercise is allowed by means of a basket carried upon the head with a weight of three to five kilos in it, which is supported by the hand of the depressed side.

Whilst the patient is suspended we have found it advantageous to manipulate, roll and percuss the muscles of the back; well known beneficial aids, not spoken of by our author, are rowing, sitting on an inclined plane with the higher shoulder towards the higher end so that the patient must bend in this direction and make a constant effort to keep from sliding off. Placing the arm of the side that corresponds to the convex dorsal curve across the front of the chest in an upward direction so as to relax the serratus magnus and rhomboidci muscles, whilst the arm of the opposite side is placed obliquely downwards across the back so as to make the same muscles on this side tense, forms a useful exercise by literally unscrewing the patient. With the arms in like position, the patient sitting on an inclined plane can pull the elastic bands and get still more effect as recommended by Professor Sayre.

This treatment is usually given once daily, but in difficult cases or where a speedy result is desired, it may be used twice a day.

Our author gives details of the treatment and results in eighteen cases. Seven of these he places little importance upon, as they were mild and would probably have recovered perfectly, if not so soon, under the usual orthopædic exercises. But it was quite otherwise with five of the cases which were much worse. In these treatment was begun without any hope of improvement and only at the request of the patients. In from twelve days to five weeks there was marked improve-

ment, they were soon able to do without their supports, the deviation in the spinal column decreased, the shoulder became more horizontal and pain and tension disappeared. Of the remaining six cases four were improved and two got well. At the time of writing several were under treatment so that the results may be still more favorable. At a time of life when the skeleton was so consolidated as it was in the case of an 18-year-old girl, it was not thought possible to produce any remodelling, but after two months' treatment it was hardly possible to perceive any deformity. Landerer finds an analogy to this last case in several of severe so-called inflammatory flat-foot or *tarsalgia adolescentium* in which he succeed in obtaining "perfect reformation" of the foot by means of massage of the plantar surface and of the leg, even at 20 years of age.

We think that another analogy can be found in the relief that massage affords in cases of rheumatic gout. It relieves the tenseness of the soft tissues and makes them more supple, so that they adapt themselves much easier to the fixed nodosities.

Our author believes in the use of supports and corsets for alleviating and correcting the position of advanced scoliosis; but when there is any prospect of improvement he considers them contra-indicated, for the little work that the muscles of the back may be capable of performing is taken away by supports and atrophy speedily results so that the muscles can no longer be used. After two or three massages he found that most of his patients could do without supports and rejoiced once more in free and lively motion.

In the discussion which followed Herr Volkmann deprecated the wearing of a plastic jacket or felt corset by day and night. He has the corset removed at night, and in the morning the patient is bathed, douched and *masseed*, and practices movements, as advised by Sayre, and about 11 o'clock the corset is again applied.

Herr Loebker stated that he believed in the energetic treatment by means of massage of those muscles which contribute to the support of the spinal column. He does not apply any supports, and improvement takes place from the time that these are laid aside.

Herr König, of Göttingen, said that Landerer's method was in ad-

vance of that hitherto employed by him ; yet he would not renounce altogether the corset treatment in favor of massage. He would limit the use of the corset to school time. Experience had taught him that the complete removal of the corset all at once hindered improvement.

Herr Kölliker, of Wurzburg, remarked that the most essential difference between Landerer's treatment of scoliosis from that hitherto employed consisted in energetic percussion of the muscles. He mentioned a very severe case of scoliosis with three curves which he had treated daily for three months by means of massage and percussion for several minutes night and morning, and thereby obtained a brilliant result never before equalled in his experience. With scoliosis of the second degree the corset should be applied in the intervals between massage.

• DOUGLAS GRAHAM.

KOEHL ON THE CAUSES OF THE DIFFICULTIES IN DISPENSING
WITH THE TUBE IN SOME CASES OF TRACHEOTOMY
FOR DIPHTHERIA.¹

The time for the removal of the canula in cases of tracheotomy must differ in hospital and private practice. If we regard a severe diphtheria as having run its course in four or five days, the trachea at the end of this time being passable to air the canula is justly removed. Delay in the removal of the tube is a fertile cause of stenosis (granulom) of the trachea. By the comparison of various statistics it is found that fourteen days is the interval at the end of which in the majority of severe cases the larynx becomes again permeable. Allowing eight days additional for attempts at removal of the tube, we have an extreme limit of three weeks to work upon. If the efforts at the removal of the canula extend beyond this period, we can with justice speak of a difficulty or obstacle to the removal of the canula. The author of the above paper has passed in review various conditions of the larynx which are apt to cause delay in removal of the canula. The first condition considered : Diphtherie a forme prolongée (Cassicourt) has

¹Ueber die ursachen der Erschwerung des décanulement nach Tracheotomie in Kindesalter wegen Diphtherie. By Emil Köhl. Archiv. f. klin. Chirurgie. Bd. XXXV, Hft. 1.