Lectures

ON

ORTHOPÆDIC SURGERY.

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LECTURE XI.

ON THE CAUSES OF CONGENITAL AND NON-CONGENITAL DISTORTIONS.

DISTORTIONS of the trunk, neck, and limbs, arise from affections of and injuries to the muscular, ligamentous, and osseous systems, and from affections of joints (whether these be occasioned by inflammation or by dislocation). These, together with some contractions of, and injuries to, the skin and cellular tissue, and malformations, constitute what is understood as orthopædic surgery.

All distortions arising from affections of the muscular system may be both congenital and non-congenital. I propose to consider, first, the causes of congenital distortions; secondly, the causes of non-congenital distortions; and, thirdly, to address myself in detail to each variety of muscular distortion.

The *causes of congenital distortions* are probably similar in every form of congenital muscular retraction; varying in degree only, but not in kind.

In the anencephalic monster, for instance, every known form of distortion may exist; such as scoliosis, torticollis, talipes, strabismus, etc.; and luxations of every kind, complete and incomplete. The spine may be curved laterally, so as to diminish by one-third or more the height of the trunk; or lordosis may exist, the occiput being drawn down to approach the sacrum; or the extensors of the leg may, being retracted, cause the leg to be bent forward upon the thigh; and in the same manner retraction of the triceps cubiti will draw the forearm backwards upon the arm. Again, a similar state of things is found to exist together with hydrocephalus and hydrorachis. There is no known form of distortion that does not occur together with lesions such as these. Thus, every congenital muscular distortion may be induced by nervous irritation.

Other causes were believed by the ancients to be sufficient to induce these distortions. But, since Rudolphi, physiologists are agreed that there is one cause only of congenital muscular retractions, and that intrauterine pressure is insufficient to occasion muscular retraction which shall give rise to distortion. Even though the liquor amnii were in great measure absent, how should the pressure of the walls of the uterus on the fœtus induce spasmodic contractions? Not only does this spasmodic condition exist, but it exists to so great an extent, that distortion may recur after section and re-union of tendons have taken place.

Like other nervous affections, congenital distortions are hereditary. For instance, five boys in one family came under my care for congenital talipes varus; their father, uncle, and paternal grandfather, having likewise suffered from similar forms of distortion. In

each generation, females were added to this family, but none of them were distorted at birth. "We cannot admit," as Dr. Little observes, "uterine influence in hereditary propagation of varus, through an uninterrupted succession of male parents." Thus we may conclude that congenital distortions depend on irritation of the cerebro-spinal nervous system.

The *causes of non-congenital distortions* are paralysis, spasm, and local inflammation; and the various forms of distortion which are induced bear strong resemblance to the analogous congenital distortions, but with certain differences, which render their diagnosis easy.

A single muscle may be affected, as the sterno-mastoid, or a group of muscles; and, according to the effect which is produced, so is the resulting distortion. For instance, spasm of the adductors of the foot induces varus; but paralysis of the same muscles gives rise to the opposite form of distortion—valgus. Again, spastic action of the muscles of the calf of the leg occasions talipes equinus; but paralysis of these muscles occasions dropping of the heel—calcaneus; and so on, through all the distortions which are occasioned by muscular and nervous influences.

Paralysis presents itself especially in three distinct forms; namely, that arising from organic change in the nervous centres; that which is occasioned by the action of cold on the muscles of the limbs, and which is known as infantile paralysis, or the essential paralysis of infants; and that which is induced by traumatic lesion of nerve-trunks.

A. Paralysis, whether hemiplegia or paraplegia, is common at every age, as a *consequence of organic change*. Hemiplegia is the result of an epileptic fit; and it may take place without the formation of a clot, and without rupture of the fibres of the brain. But loss of muscular power may occur also through congestive apoplexy and without effusion of blood; or it may take place with effusion.

During infancy, paralysis not unfrequently occurs without evident cerebral disturbance, perhaps during sleep or while a child is at play, without previous indication, and while the child is apparently in its usual health. Three such cases have been brought under my notice this day. A child, two years of age, was playing in his father's garden, when he suddenly lost the power of his lower limbs, and became perfectly paraplegic. Some of the muscles partially recovered power, and certain contractions in consequence took place. When he was 28 years of age, I was consulted. On the left side was talipes equinus, and on the right was talipes calcaneus. The muscles of the hips were not paralysed.

Again, a child was brought to me with paralysis of the external rectus of the right eye, of the extensors of the wrist and fingers, and of the flexors of the foot of the right side. The child was ten months old, and the paralysis was observed at the tenth week; that of the eye before any head symptoms were observed; then a slight epileptic seizure took place, and immediately afterwards paralysis of the extremities was noticed. I saw the third case with Mr. Squire. At six months, the child was convulsed, and lost consciousness for several hours. Hemiplegia succeeded, the left side being affected.

In cases such as these, a single muscle may be affected or a group of muscles, or a limb, or the power of one side may be lost, or both upper and lower extremities may be simultaneously paralysed.

Florid children are scarcely less frequently the subjects of these attacks than the weak and ill-nourished. Over-excitement may produce a similar result to that which is due to insufficient nourishment.

B. *Infantile paralysis or essential paralysis of infants, or myogenic paralysis*, is very common during infancy, and it rarely occurs except at this age. It takes place without appreciable nervous lesion. After paralysis has existed for some time, atrophy of the nerves which supply the paralysed muscles takes place. Sensation is seldom impaired, but the power of motion is lost.

This form of paralysis usually attacks before two years of age. It is occasioned by throwing off the bed-clothes during sleep, or by other sudden exposure to cold, such as sitting on a stone or other like cause. Loss of power usually occurs without pain: acute pain is, however, occasionally found to exist in these cases. Perhaps the extensor muscles of the leg and some of those of the thigh are more frequently affected than any other groups of muscles in this form of paralysis.

C. *Traumatic lesion of nerve-trunks* is a rare cause of distortion. I have seen talipes calcaneus produced by the removal of a portion of the posterior tibial nerve, together with a tumour, from the back of the leg; and I have also seen somewhat similar results from gun-shot wounds; indeed, they were far from uncommon after the Crimean war. Traumatic lesions, when they occur, are seldom remediable.

Spasm and paralysis not unfrequently co-exist—spasm of one limb together with paralysis of another. Cerebral disturbance usually accompanies spasmodic muscular contractions: probably a succession of slight convulsive attacks takes place, which are followed by rigidity of the muscles—tonic spasm; and the most powerful muscles remain the most affected, or they appear to be most affected. Thus the thighs are in these cases usually flexed upon the trunk; the knees are approximated, and they are even crossed one over the other. Frequently, they are maintained in this position so rigidly, that the application of considerable force may be insufficient to separate them; the legs are flexed upon the thighs, the feet are extended and inverted, and the toes are flexed. The arms are bound to the sides by the combined actions of the latissimus dorsi and pectoralis major muscles, or the latter muscle alone acting on both sides, the arms may be crossed on the chest; the forearms are flexed upon the arms, the hands are prone, and the fingers are flexed. The internal rectus muscle is also not unfrequently affected, occasioning convergent strabismus; or, as in a case now under my care, the superior and external rectus of each side may be at the same time affected, causing a hideous and meaningless countenance. Thus every muscle may in one case or another be subject to this undue action.

Spasm of the extremities of one side is much more common than more irregular muscular action. And strabismus, when it occurs, is found to exist on the same side as the rigid muscles. In spasm, as has been already said, the strongest muscles usually distort the limb; they overcome their antagonists simply because they are the most powerful; and thus it is that the adductors and flexors are especially the muscles which act on the limbs in these cases.

The countenance is, for the most part, indicative of cerebral disturbance; there is a vacant expression, and the child is dull and listless, or very excitable.

These children are, however, not unfrequently more intelligent than a casual observer might perhaps believe. In some, the intellect remains absolutely unimpaired. These cases are rare, however.

Cerebral symptoms are generally preceded by spasmodic contractions. These are frequently overlooked, however; or their importance is not understood; so that symptoms, which should be premonitory, such as squinting, etc., are, perhaps, only alluded to with any degree of importance so late that the mention of them becomes unimportant. The cause of irritation not having been recognised, irreparable mischief is allowed to occur, which might, perhaps, have been warded off.

It cannot be doubted that congenital distortions and non-congenital distortions which are occasioned by affections of the nervous system own a common origin. Every circumstance—the forms of distortion, and their modes of production—tends to show that this must be the case. This spasmodic action is occasioned by the want of proper stimulation—by an insufficient supply of red blood, for the most part, and through a deficiency in the several vital agencies which act as stimuli on the muscles. Formerly, it was thought, that spasm was induced by excess of nervous stimulation; now, however, it is recognised as an irregular action consequent on debility.

Inflammation resulting from injuries and wounds occasions distortions. Contraction takes place with cicatrization, and even after this seems to be complete; and it gives rise to every form of distortion. The amount of distortion depends much more on the position of the cicatrix than on its extent. There are very few positions, however, in which distortion may not be prevented entirely or in great part.

ANCIENT MAN. The proofs, says Mr. Falconer, of the remote antiquity of man are derived from two sources—1, the ancient, or river gravel-deposits; 2, the ossiferous caves. The former carries man furthest back in time, and with the greatest certainty; but it is of the most meagre and restricted character, consisting merely of flint weapons. Not a single instance has yet occurred of a fragment even of an unquestionably authentic human bone having turned up in these deposits. On the other hand, the evidence yielded by the caves, although less certain as an index of remote time, is infinitely more instructive. It tells us, in certain cases, the division of the human race to which man, the early tenant of the caves, probably belonged; what was his stature and what his physical powers; what the animals which were his contemporaries; what the mollusks, fish, flesh, and fowl upon which he fed; that he cooked his meat by fire; that he extracted the marrow from the bones, and how he did it; how and with what weapons he killed his game; how he flayed and dressed the hides; that he scraped the meat off the bones; that he carefully cut the sinews of his slaughtered deer for harpoon lines, or for the fibre of sewing thread for his fine-pointed pierced needles; where and in what direction he cut the sinews; what the implements and weapons—in stone, bone, and deer's horn—which he used; what his ornaments, and how he disposed of his dead. In short, beside the bare fact that primeval man existed during the early "fluviatile drift" period in Europe, all that we know of him—exclusive of the later "kitchen-middens" and "pile-habitations"—is derived solely and entirely from the ossiferous caves.