THREE CASES OF ACUTE ANTERIOR POLIO-MYELITIS (ACUTE SPINAL PARALYSIS) IN ADULTS.

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(Concluded from page 851 of last number.)

CASE II.—E. W., a young woman aged 20, single, living in the country under good conditions, had always had good general health before the present illness. There was no suspicion of syphilis, and no neurotic history in the family. The present illness came on in September 1876. She had been in good health, when one evening, without any history of exposure to cold or other exciting causes, she felt as though she had "cricked" her neck; there was a little pain in the back of the neck, and the neck was very stiff. She felt the same pain and stiffness on getting up next morning, and in the course of the day a bad headache came on with a feeling of sickness. That evening the left hand shook a good deal when she was using it. The following night, she woke up and found that the left arm was entirely powerless. She felt weak and poorly in herself, but there was no pain or any affection of sensation in the arm or hand. She felt ill for four days, when severe sickness came on, and she vomited repeatedly for a whole week. At the end of this time, her general health improved considerably, but the left arm continued quite powerless, and she had at times pain across the shoulders which she compared to rheumatic pains. There was at no time any sensation of tightness round the neck or chest. From the first onset of the weakness, all the muscles of the affected arm were quite flaccid. Three or four weeks after the commencement of the illness, the patient herself noticed that the muscles about the shoulder were wasting; and shortly afterwards the muscles of the arm and hand were likewise found to be markedly smaller than on the healthy side. At the end of three months, the wasting was very great. At that time, she was prescribed a course of arsenic, and considerably improved under the treatment. She was admitted into the National Hospital for Paralysis and Epilepsy in February 1878, under the care of Dr. Radcliffe, to whom I am indebted for permission to publish the case.

At the time of her admission, there was very marked wasting of all the muscles of the left arm; the deltoid was almost absent, the shoulder being flattened, and the point sharp. The arm round the middle of the biceps measured only eight inches and a quarter in circumference; the right arm measuring nine inches and five-eighths. The power in the deltoid was quite gone, as she could not remove her arm from her side. She was able, however, to bend the elbow fully, but her power of resisting forcible extension of the joint was very small. There seemed to be no power whatever in the triceps, which had almost completely disappeared.

The muscles of the forearm, both flexors and extensors, were very much wasted, the greatest circumference of the limb below the elbow being eight inches and a quarter, as opposed to nine inches and a half on the right side. The hand was in the "main-en-griffe" position, typical of wasting of the interossei and lumbricales; the tendons of the flexor muscles were sharply defined under the skin of the palm, and the metacarpal spaces were sharply defined on the back of the hand. The thenar and hypothenar eminences had almost completely disappeared. The patient was able to flex her wrist fairly well, though with only slight power of endurance. She had great difficulty in producing extension of the joint. She could squeeze a little with her fist, but could not bend the first and third phalanges, nor extend the second phalanx of the fingers. She could hold a fork in the hand, but could not make use of it. Sensation appeared to be wholly unaffected.

Examined electrically, the muscles presented the reaction usually found in old cases of acute atrophic paralysis, namely, more or less complete loss of reaction to the induced current, complete loss of reaction to voltaic electricity applied over the nerves, and marked diminution to the voltaic current applied over the muscles. I need scarcely repeat what I have already said, that this last peculiarity is only found in the later stages of this malady, and that in the early stages there is almost invariably an increase of irritability in the affected muscles to voltaic electricity when the poles are applied over the muscles themselves.

Her general health was good, and none of the other limbs were affected in any way. There was likewise no affection of the serratus magnus, rhomboidei, or pectoral muscles on the left side. Under treatment, which consisted mainly of tonics, voltaic electricity to the affected limb, and the use of Junod's boot to increase the circulation in the arm, there was some little improvement; the metacarpal spaces became somewhat

more filled up; she was able to extend the wrist considerably better; and she regained the power of doing many little things which were impossible to her when she first came into hospital.

CASE III is that of a girl aged 19, single. She had generally lived at home in the country under fairly good circumstances; but for some little time before the onset of the present illness she had been acting as shopwoman in a confectioner's shop, where she was a good deal exposed to draught. There is no other history of exposure to cold or wet. The family history was good, her father and mother and ten brothers and sisters all being alive and in good health. The patient was never very strong, and since the establishment of the menstrual function, about four years before her present illness, she had been subject to palpitation and general weakness. There was no suspicion of syphilis. Her present illness began in July 1877. The first thing which attracted her attention was that her legs pained her a good deal, the pain being worst in the calves. The pain was aching in character, not shooting or burning, and worse by day than by night; it was not sufficiently severe to prevent her from keeping at her work. Two or three days after the first onset of this pain, she felt a sort of itching or irritation in the legs, and there was a feeling as though a strap were bound very tightly round the legs above the knees. About two o'clock the next morning, she woke up with a severe dull aching pain in the small of the back; and on that day she had severe pains all over her. She was very hot and "nervous", and the doctor who was called in said that she was delirious. Two days afterwards, she found that she had completely lost power in her right leg; but the other limbs became very much better. She believes that she was feverish and delirious for about a fortnight altogether. There was no sensation of tightness round the waist, no affection of ordinary sensation, and no difficulty with the bladder throughout her illness.

About three weeks after the first onset of her illness, she experienced a very sharp pain in the right leg. The pain was still seated in the calf of the leg, but it was now very sharp, as though something were being cut out of it. The pain was so severe as at times to make her cry out. It lasted for about a week or ten days. It was relieved by lying down, and worse when she sat up.

She remained very ill for two months, but at the end of that time she began to improve in her general health, the right leg, however, still remaining quite helpless. About four or five months after the first onset, the power began to return; and since that time she continued to gain a little power in the limb.

She did not notice any difference in the size of the limbs until about six months after the onset of her illness; but, as she found at that time there was a very marked difference in the size of the limbs, it is probable that the wasting of the right leg had come on some time before without her being aware of it. From the first, she has noticed that the right leg has been colder than the left, both in its own feeling and also when tested with her hand.

The patient came under my care at the Royal Infirmary for Children and Women in May 1878. She was a fairly well nourished but somewhat anæmic girl. The right leg was so weak that she was scarcely able to bear any weight upon it, the left leg being quite healthy. The weakness involved the psoas and iliacus, for she was able to resist forcible extension of the hip-joint with much less force on the right than the left side. There was, however, sufficient power left in them to enable her to raise the foot six inches off the ground. All the muscles of the thigh were more or less weakened—much more so than the psoas and iliacus. The muscles of the calf were quite powerless; but the extensor muscles of the toes and the tibialis anticus retained a certain amount of power, for she could flex the ankle and extend the toes fairly well, and could offer a slight resistance against forcible extension of the ankle-joint. The peronei muscles were quite powerless.

There was very marked wasting of the right leg. The circumference of the middle of the thigh was, on the right side, only fifteen inches and three-quarters; on the left side, seventeen inches and five-eighths. The greatest circumference of the calf was, on the right side, eleven inches and a half; on the left, thirteen inches and a half. The muscles of the right leg were very flabby, and the limb felt much colder to the touch than the left leg. There was very decided flattening of the right buttock, and the fold formed by the gluteus maximus was less deep, and descended lower on the right than to the left side.

The wasted muscles presented the typical reaction found in old cases of infantile paralysis, viz., diminution or loss of reaction to both currents, both when applied over the muscles themselves and through the nerves. In the calf muscles and in the peronei, in which power was completely gone, there was no reaction to either current. There was a slight reaction in the rectus femoris to a strong faradic current, but none to a strong galvanic current; whilst in the extensors of the toes, though there was distinct diminution in reaction to both currents, the reaction

was very much more considerable than in the muscles already mentioned.

There was no affection of sensation.

The patient was prescribed tonics and cod-liver oil, and the constant current was ordered to be applied to the leg every day (labile application current as strong as she could comfortably bear it). After about three months' treatment, the patient was discharged without improvement.

REPEATED PAROXYSMAL FAILURE OF SIGHT, IN CONNECTION WITH HEART-DISEASE.*

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IN the cases, by no means uncommon, in which patients come under care for temporary failure of sight, in a large proportion the symptoms are due either to megrim, or to a temporary and varying failure of accommodation, or to some less common local conditions. But a few cases remain in which we can invoke neither central nervous disturbance, as in megrim, nor any transient nervous or muscular failure of accommodation, and of which temporary arrest of blood-supply to the retina seems the only feasible explanation.

These patients who, so far as I have yet seen, are always the subjects of valvular heart-disease, are subject repeatedly to loss of sight for a short time. The attacks vary considerably in severity, but they all agree in general features; the failure comes on suddenly, lasts a short time (from a few minutes to an hour or two), affects only one eye, and passes off almost as quickly as it came on. Not only is the affection asymmetrical, but the same eye suffers repeatedly, whilst its fellow may escape altogether. In certain of the cases, an attack at length occurs which, instead of passing off as usual, leads to permanent blindness. Such cases, although rare, are well known and have attracted the attention of many observers (especially Knapp, Moos, Loring, Mauthner), and various explanations have been offered.

The fact that the cases occur in connection with heart-disease seems to point to some circulatory disturbance as the cause of the symptoms. The difficulty is to explain a disturbance or arrest of blood-supply which, whilst it happens repeatedly, is, as the symptoms show, not only very localised, but always affects precisely the same part. We cannot suppose that the same artery, whether in the eye or the optic centre, is repeatedly plugged by embolism; nor can the symptoms be accounted for by a general failure of the cerebral circulation, nor by fainting; for the patients, though often suffering much from headache and giddiness, never actually faint during the attacks, nor does either posture or exertion seem related in any way to their onset. We seem to be driven by exclusion to the hypothesis of some permanent local disease of the ophthalmic artery, or its branch to the retina. Thus, whilst we can readily suppose that disease of the arterial coats, narrowing the blood-channel to the retina, might cause no symptoms, so long as the general circulation was healthy; we may note that the local conditions mentioned below make it likely that if, with the ophthalmic artery narrowed by disease, the intracranial circulation were also liable to disturbance from heart-disease, the stream of blood to the retina might now and then be suddenly stagnated for a short time.

The natural elasticity of the coats of the eye offers an especial obstacle to the entrance of blood; the arterial twig which supplies the retina is one of the most insignificant branches of the ophthalmic artery, and its current, therefore, relatively weak, and lastly, the current in the ophthalmic artery itself must be a weak one; for this artery is given off at a right, if not an obtuse, angle from the tortuous part of the internal carotid. A narrowing of the lumen, which would have but little effect in a vessel carrying a strong stream, might hinder or stop the flow of a feeble stream, either by increasing the friction or serving as the nucleus for a thrombus—a result which, though capable of recovery and repetition, might at any time become permanent. Such lasting blindness at length occurred, e.g., in a case reported by Loring, after very numerous temporary attacks, which were spread irregularly over a period of five-and-twenty years.

The hypothesis of local arterial disease certainly, however, makes it difficult to account for the tendency to symmetry which is noticed in many of the cases, the second eye often becoming subject to the same symptoms after the first has suffered for some time, or has become blind. The difficulty, however, is not greater than in chorea where, as Dr. Dickinson has shown, there is a strong tendency to symmetry in the distribution of the arterial lesions. In one of my own patients, chorea had occurred many years before.

I know of no *post mortem* examination of the ophthalmic artery in such a case, and of only one record of ophthalmoscopic examination during one of the attacks. In this case, Mauthner* found that the retinal arteries were empty during the blindness; but that when, a few minutes later, the sight had returned, the arteries had resumed their proper size—changes, it may be noted, in perfect accordance with such an explanation as I have offered. In many instances, these cases remain "functional" ones throughout our observation of them; and I should not have ventured to ask your attention to the subject now, had I not had the opportunity of watching two patients in whom the onset of permanent blindness of one eye, from vascular blocking, drew special attention to the nature of the temporary attacks in the other. In the first case, one eye having itself been subject to the transient seizures, ultimately went blind with the ophthalmoscopic signs of arterial plugging; after which event, the second eye became the victim of similar transient attacks.

CASE 1.—*Transient Attacks of Failure of Right Eye, followed by Permanent Blindness, with Ophthalmoscopic signs of Arterial Blocking: subsequently, many temporary attacks of greater or less Blindness in Left, with contraction of Visual field: Mitral Stenosis: Chorea ten years ago.*—Jane S., aged 26, came to the South London Ophthalmic Hospital on February 9th, 1878, for defect of the right eye. On the 4th, she had gone to bed seeing as well as usual, and, on waking on the 5th, noticed something amiss, and on trial found the right eye was nearly blind. It did not alter between that time and her admission, when she could only see shadows at six inches. The pupil scarcely acted alone, but acted well with its fellow. The ophthalmoscope showed the appearances commonly taken as characteristic of embolism: dense white haze of the central region of the retina and of the disc; the branches of the arteria centralis reduced to about half their proper size, quickly disappearing at a distance from the disc, and not pulsating at all, even on the firmest pressure, though some branches on the disc were slowly emptied by this means; the veins much diminished in size on the disc, some being even smaller than corresponding arteries, diminishing little, or in some cases not at all, towards the periphery, but never getting larger. An island of retina, from the disc towards, but not quite up to, the yellow spot was clear, and on inspection proved to be supplied by two little arteries, which gave evidence of being branches of the ciliary system, and not of the arteria centralis.† These two arteries pulsated easily on light pressure, and were, therefore, pervious; the corresponding part of the disc was much less hazy than the rest, but far from healthy.

February 16th. Pulsation was now easily obtained in the central trunk, and all its main divisions at the centre of the disc; but it did not extend up to the border of the disc. The retinal haze was less dense; the vessels, even the finer ones, which were hidden by it last week, were now visible, and thrown up by the haze behind them. Vision was unchanged.

March 2nd. Vision was unchanged. The retina and disc were nearly clear, but the disc was pale all over. All the vessels (including the two cilio-retinal arteries) were much shrunken, but the arteries pulsated well on pressure. There was a small hæmorrhage near the yellow spot (revealed by disappearance of the haze).

The ophthalmoscopic appearances have remained the same, excepting that the disc has become perfectly clear. In particular, it is to be noted that at the last examination (January 16th, 1879), the arteries all pulsated easily. She had bare perception of light with the eye.

She was a well-nourished woman, accustomed to live with her parents and earn her living by needlework; of very nervous temperament, easily blushing, her lips trembling, and one side of the face often twitching a little when spoken to. She had for some time been liable to headaches and coldness of the extremities. She had never had rheumatic fever, nor any rheumatism; but, at the age of sixteen, she was for six weeks an in-patient of King's College Hospital with "chorea", chiefly of the left side, which, she says, was attributed to a fright, though she denied knowledge of such a cause. Her mother is "very hysterical", and subject to "a sort of faint" when upset. Dr. Allen Sturge, who kindly examined the patient's heart on the day of her admission, found a well-marked mitral systolic bruit.

The interest of this case, for our present purpose, turns upon the symptoms in the other eye and on her headaches and general condition. It will be remembered that she said, on first admission, that she was subject to headaches and cold feet. But these headaches became much more troublesome after the occurrence of the arterial blockage in the right eye; and she had a number of troublesome symptoms, includ-

* Read at a meeting of the South London District of the Metropolitan Counties Branch.

* *American Journal of Medical Science*, July 1874, p. 273, from Stricker's *Med. Jahrbücher*, 1873.

† See *Ophthalmic Hospital Reports*, vol. ix, part II.