CEREBRAL SYPHILIS.

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Amongst all forms of visceral syphilis, the cerebral lesions are by far the most important, both on account of their frequency and the gravity of their symptoms. Fournier¹ has found the cerebrum affected in 631 out of 3,429 cases of tertiary syphilis, that is in 18.5 per cent of all cases, thus showing that cerebral lues is from five to six times more common than that of the spinal cord.²

Cerebral symptoms may follow the primary lesion within a very short time.²¹ Brasch³ recently reported a case in which the first sign of an intracranial lesion occurred within four months after the infection; Darier,⁴ in *Debove-Achard Manuel de Médecine*, places an instance on record in which but five months had elapsed before the first indications of a brain trouble were noticed; in one of Baudouin's⁵ cases, a specific basal meningitis and arteritis caused the death of the patient eight months after the appearance of the chancre. A patient who is at present under my care contracted syphilis in July, 1895, and three months later had hemiplegia, for which no other reason could be found but the infection. Further developments in this case prove beyond all reasonable doubt the correctness of the diagnosis of lues cerebri.

On the other hand, it is not very uncommon to see a long term of years elapse before grave cerebral symptoms follow the *ulcus durum*, though Darier's⁴ case, in which thirty-seven years had gone by before the brain was affected, is certainly a very exceptional one. Most commonly this occurs between the third and eighteenth year, and in the majority of cases within the first decennium.

It is but natural that we should find cerebral lues much more frequently in males than in females, for statistics have taught us that syphilis occurs about eight times as often in men as in women, and about the same ratio is found in the parasymphilitic diseases, such as locomotor ataxia and dementia paralytica. This tallies very fairly with the figures of Gaudichier,⁶ who found but 39 women among 376 patients suffering from cerebral syphilis. Of 62 patients suffering from paralysis spinalis syphilitica, whose

histories I published some years ago, but 6 were women.⁷ While syphilis of the brain may occur at most any age, it is most frequently seen between the thirtieth and fortieth years of life. The reasons for this are obvious. As we have already seen, the primary sore is most often followed by cerebral symptoms within the first ten years, and the infection takes place between the second and third decades of life, in the majority of cases.

Predisposing causes may be entirely absent, but as a rule we find that either a hereditary neuropathic disposition, cerebral overexertion, an injury to the head, or chronic alcoholism have paved the road for an attack upon the brain. Of 100 cases published by Tarnowsky,⁸ there were 43 with chronic alcoholism, 29 with neurasthenia (of these 18 with a neuropathic disposition), 5 with injuries to the head, 23 in which no predisposing cause was ascertained.

These statistics, however, are undoubtedly vitiated by the fact that chronic alcoholism is excessively frequent in the author's native country. Judging from my personal experience, I would say that with us a neuropathic disposition and psychic traumata, such as cerebral overexertion, worry, etc., are more important factors than chronic alcoholism, and that this explains why syphilis of the brain is more common among the so-called better classes, among the brain workers, than among those who earn their livelihood by manual labor.

An energetic and thorough treatment of the early stages of syphilis certainly decreases the danger of cerebral lesions, but does not remove it entirely. It has been known for some time that not only acquired but also hereditary syphilis may attack the brain, but only recently we have learned that the first symptoms of hereditary brain-syphilis need not occur during the first few months or years of a child's life, but may not become evident before the ninth or fifteenth year (Fournier⁹); according to some authors, even much later, i. e., between the twentieth and thirtieth years of life. The statement that not only the children of a syphilitic person, but his grandchildren as well, may be the victims of their ancestors' disease, lacks all proof, and can not at present be accepted.

I can not enter into a discussion of the pathological anatomy of cerebral syphilis here, but will state as briefly as possible in what ways lues may affect the brain. The most common anatomical lesions found are those of a specific arteritis; in fact no less than about one-half of all cases of lues cerebri are due to this form.¹⁰ Among these we find that certain arteries are much more liable

to be affected than others. Erlenmeyer found that of 100 cases in which a specific arteritis existed in the vessels of the brain, the *arteria Fossæ Sylvii* was affected in 46, the internal carotid in 26. The next seat of election are the basilar and vertebral arteries, while the arteries corporis callosi and the terminal cortical branches are but very rarely involved. An interesting and important fact taught by the study of these conditions is the marked predominance of the left side over the right.

Another frequent form of cerebral syphilis, though by far less common than the one just mentioned, is basal meningitis. Gummata and circumscribed or more or less diffuse sclerosis of the cerebral tissue represent rarer forms of cerebral disease. The same applies to the meningitis of the convexity of the cerebrum. Syphilis has frequently been mentioned by authors of late as one of the exciting causes of various neuroses, particularly of neurasthenia,¹¹ but also of hysteria, epilepsy,⁸ chorea, of certain mental disturbances,⁵ and of paralysis agitans.¹²

The symptoms of cerebral syphilis naturally vary greatly, according to the nature of the lesion and its seat, so that one can say that there is no one cerebral symptom which does not occur with greater or lesser frequency in this disease. But there are certain characteristic features about a large number of these cases which enable us to recognize with some degree of certainty the etiology of the disorder.

The first to be mentioned amongst these is the fact that the onset of grave troubles is very often preceded by a prodromal stage which is very similar in all of the anatomical forms just enumerated. The vast importance of studying just this phase will be readily understood, for it represents that time during which therapeutic measures offer the greatest chances of success, when by prompt and energetic treatment we can often prevent the occurrence of destructive lesions and irreparable damage.

During this premonitory stage of the disease remissions and intermissions are of very frequent occurrence, so that they might almost be called pathognomonic. The most common symptom of this period is headache, the *cephalea syphilitica*. It is found in at least two-thirds of all cases,¹³ and is relatively rare, only in cases of syphilis transmitted by heredity or acquired at a very early date.¹⁴ The pain is usually deep-seated, either pressing, constricting, or hammering in its character, more often frontal or occipital, occasionally diffused, and when it is localized is commonly associated

with local tenderness to deep pressure or percussion. It is almost invariably very violent, and has in some instances driven patients to suicide. The fact that it commonly undergoes exacerbations toward evening or during the night, thus causing insomnia, is of the greatest diagnostic value, though there are some exceptions to this rule. Another feature about the cephalalgia that is characteristic is its persistence and tendency to recurrence, unless the proper treatment is used. Simultaneously with the occurrence of these headaches the intellect and character of the patient is often affected. All cerebral activity becomes painful, mental labor is rendered difficult, the attention is not easily fixed upon any one subject. The patient may become depressed, irritable, subject to sudden, unwarranted outbursts of passion. At the same time weakness and loss of flesh are often found. Furthermore, there may be such symptoms as attacks of vertigo and reeling, momentary dimness of vision, subjective noises, paræsthesia in the extremities, rheumatoid pains, passing impairment of mobility or of speech—the latter sometimes amounting to transitory aphasia—short attacks of unconsciousness.

These symptoms, or such of them as may be present, gradually become more pronounced and more permanent, and to them are added others, which vary according to the seat and the character of the cerebral lesions. The most common anatomical substratum found in these cases is the syphilitic arteritis, as I have already stated. Its symptoms do not differ very materially from those of an arteritis due to other etiological factors, though there are some details which will very often enable the careful observer to ascertain correctly the cause of the trouble. Thus the age of the patient is of some importance, syphilitic arteritis frequently occurring at an age at which diseases of the blood vessels from other causes are exceptional. The existence of a prodromal stage, such as I have just described, is of the greatest diagnostic value. Syphilitic aphasia, when once established, does not in any way differ from an aphasia due to other lesions, but the fact that the permanent establishment of the symptoms is very often preceded by brief transitory attacks of impairment of speech, which pass off sometimes after a few minutes, sometimes after a day or two, and may be separated from each other by intervals of some years, as I have seen in one instance recently, these points are very characteristic of specific lesions. This disorder of speech is known under the name of the intermittent form of aphasia (Mauriac).

It may be associated with slight weakness of the right side of the body, of short duration, with changes in the pupils, and may be followed by mental torpor or brief delirium. As a rule each successive attack becomes more serious, the aphasia is more complete, lasts longer, the accompanying symptoms are more marked, and finally, unless appropriate treatment interrupts the course of the disease, permanent loss of speech, associated with hemiplegia, may result. The latter, hemiplegia, is one of the most frequent symptoms of cerebral syphilis. Its onset is mostly preceded by paræsthesia or weakness in one extremity or on one side of the body, sometimes by one or more attacks of transitory hemiparesis or hemiplegia. As a rule the patient does not become unconscious, the paralysis developing rapidly within a few minutes or hours. Cases in which days and weeks passed by before a slight hemiparesis had gradually changed into a complete hemiplegia have been recorded, but are rare. Paresis is rather more common than total paralysis, and often the loss of power is unequal in the various segments of the affected side. The sensibility may be affected, though it is more commonly preserved. The same applies to the intelligence. According to Fournier, double hemiplegia is not excessively rare in syphilitics, the two sides becoming affected within a few days in some instances; in others within a few weeks, and occasionally within some years. A patient who is at present under my care developed left hemiplegia and about eighteen months afterward a spastic paresis of the right lower extremity. Some instances of so-called pseudo-bulbar paralysis were cases of bilateral syphilitic hemiplegia.¹⁶

A second form of specific cerebral trouble, the syphilitic basal meningitis, is more characteristic in its symptoms than the one just described. The usual course of the malady is as follows: A patient who for some time has been suffering from typical specific cephalalgia is compelled, by a feeling of general malaise, to take to his bed. Soon a state of mental torpor develops which, together with projectile vomiting and attacks of dizziness, occasional attacks of unconsciousness and, in some instances, convulsions, indicate cerebral disease. The state of consciousness differs from that found in cases of cerebral tumors in that it is not a continuous, slowly-increasing, mental hebetude, but consists rather in attacks of more or less profound unconsciousness or maniacal states, separated from each other by intervals of relative mental clearness. These attacks have a tendency to appear particularly toward even-

ing. In a case which I recently had under my care there existed a state of pronounced torpor during the day, followed by intense excitement and a tendency to violence during the evening and night, while whatever sleep the patient did get came to him in the early morning hours. Later on, as improvement set in, the patient would be normal mentally during the day, but with dusk would again become more or less agitated and excited.

If we examine our patients at this stage of the disease we will find symptoms of lesions, more or less diffuse, but referable to some trouble at the base of the brain. By far the most important among these is paralysis of cerebral nerves, and of all cerebral nerves it is the oculomotor which is involved in the greatest number of cases. Next to this in frequency come lesions of the optic nerve, while the other ocular nerves are attacked in only a small number of cases. But there is no cranial nerve which has not been found affected in some instances of syphilitic basilar meningitis, the paralysis often being partial, involving only a portion of a nerve, and the distribution of the entire lesion being such as to indicate a diffuse but not necessarily continuous anatomical change at the base of the brain. When the inflammation reaches the fifth nerve neuropathic keratitis may result, and may, in spite of early and skillful treatment of the eye, cause severe impairment of vision.

The fact that these nerve-palsies are occasionally associated with hemiplegia sometimes gives rise to very curious groups of symptoms which may be exceedingly misleading. So-called alternating hemiplegia, paralysis of the limbs on one, of cerebral nerves on the other side of the body is by no means very uncommon, and we must beware of mistaking such cases for central lesions.

In the majority of these cases the temperature remains normal during the entire course of the disease.

Syphilitic meningitis of the convexity of the brain is much less frequently met with than that of the base, and its symptoms are less characteristic. Most commonly we will hear the patients complain of an intense headache, usually with the typical nocturnal exacerbations, sometimes localized and associated with local tenderness to percussion. The motor centers and those of speech are involved in a large number of cases, hence we often see Jacksonian epilepsy, monoplegia, hemiplegia, or the various forms of aphasia. The onset of the trouble is usually a gradual one, and frequent remissions, and even intermissions—in short, an irregular development, one “in fits and starts”—is common in this as in every

other form of syphilis of the central nervous system. The phenomena of increased cerebral pressure are but very infrequently met with during the course of the disease. A marked impairment of intelligence justifies us in suspecting a process which extends over a large area of the brain.

Some few instances of acute cerebral meningitis of syphilitic origin are on record.¹⁹ They could not be differentiated clinically from acute meningitis due to other causes.

Gummata of the brain are usually multiple. Not very infrequent in adults, they are very rare in children. Thus Peterson has found but one case of gumma in a child among 335 cases of tumors of the brain. They are rarely localized in the cerebellum, hardly ever in the large central ganglia, most frequently in the centrum ovale. Their symptoms are those common to all tumors of the brain, such as intense headache, vomiting, papillitis, general convulsions, and the only peculiarities which may aid us in making a differential diagnosis is the frequency with which grave symptoms appear quite suddenly, and the occurrence of such remissions as are common to all forms of cerebral syphilis.

Syphilitic epilepsy may in no way differ from ordinary so-called idiopathic epilepsy. Every case in which the convulsions first appear between the twenty-fifth and forty-fifth years of life is suspicious. Both *petit mal* or *haut mal* may occur, and they are sometimes combined with other symptoms of cerebral syphilis. Grasset states that the initial cry is often absent, and that the intervals between attacks are less completely devoid of morbid phenomena than in idiopathic epilepsy. In one case which came under my observation some months ago, the seizures had existed for some years before a typical syphilitic cephalalgia showed the source from which they had sprung. The convulsions had become less frequent under treatment with the bromides, and disappeared promptly with the headache when the patient was put on iodides and mercury. After a short time he considered himself cured and neglected the treatment, and very soon the cephalalgia, but not the epilepsy, returned. It is hardly necessary to recall the well-known fact that syphilis of the parent is one of the important causes of epilepsy in children.

These, then, are the more common forms of lues cerebri. We have seen that no cerebral symptom is known which does not occur in some of them. On the other hand there is not one among its many manifestations which occurs only in syphilis. Still we are able to

make the diagnosis of cerebral syphilis in a very large number of cases independent of any history of venereal infection, and without the aid of the patient's confession. To show how that could be done was the principal object of this paper. The important points are: Firstly, the nature of some symptoms, such as intense headache with nocturnal exacerbations, the frequency of certain ocular disturbances, the irregular character, association, and sequence of the symptoms, and — a point upon which I wish to lay the greatest stress — their great variability. Secondly, the age of the patient — from twenty-five to forty-five years — a time at which similar disorders from other causes are rare; and, finally, the effect of anti-syphilitic treatment.

As to the course of the disease, its development is usually a gradual one, progressive but irregular, not rarely even intermittent.

The prognosis is a fairly favorable one. Fournier publishes statistics comprising 90 cases. Of these, 14 succumbed to the disease; 33 lived with grave, 13 with slight, infirmities, while 30 were cured. Nannyn has seen 8 out of 52 grave cases recover. He states that after the fortieth year of life, and more than ten years after the infection, the prognosis is less favorable than at an earlier period. The prospect of a complete recovery varies of course with the pathological lesion. In hemiplegia we can hope for a favorable outcome only when the case comes under proper treatment at a very early stage. After contractures have once become established the outlook is a very sinister one. Even at this stage, however, I have seen a marked improvement recently under the Baccelli treatment, of which I shall have more to say later on.

In basilar syphilitic meningitis a complete recovery is not uncommon, though distinct atrophy of the optic nerve and paralysis of cerebral nerves which has existed for some years is usually permanent.

Meningitis of the convexity of the brain gives a still more favorable prognosis, a complete recovery being the rule rather than the exception, provided, of course, that prompt and energetic treatment is instituted. In syphilitic epilepsy we are often able to stop the occurrence of seizures entirely.¹⁷

Two points, however, should always be considered when giving a prognosis: The fact that a certain degree of mental weakness is a rather common permanent effect of all of these forms, and that the danger of relapse is in every instance great.

The treatment of these conditions is very simple, but it should be both energetic and long continued. Practically¹⁷ all authorities agree to-day that reliance should not be placed upon the iodides alone, and quite a few neurologists consider mercury the more powerful remedy in syphilis of the central nervous system, and to these I belong. The following is the plan which—*mutatis mutandis*—I usually pursue in such cases: First, the patients are ordered to use ungt. hydrarg. ciner., 3.0 per diem, increasing the dose as rapidly as is possible until the patient's gums show the first signs of being affected. A different part of the body is used for these inunctions on each day of the week. A cool (not cold) bath precedes each rubbing, and the mouth is cleaned frequently during the day with a gargle containing chloride of potash. In mild cases this treatment alone is continued for about thirty days; in more severe ones I add iodide of potassium, beginning with moderate doses and increasing them rapidly as far as I safely can. At the end of the first month the mercury is discontinued and the iodides alone are given for another month. At the end of this time the inunctions are resumed, if the symptoms have not all disappeared, and if the patient's general health admits it, either with or without the iodides, according to the gravity of the case. After the symptoms have disappeared, or when the patient shows signs of anæmia, I am in the habit of giving tonics for about thirty days, one of my favorite prescriptions being Erb's tonic pill:

R

Ferr. lactic.....	5,0
Extr. cinchon. aquos.....	4,0
Extr. nuc vomic. spirit.....	0,5
Extr. gentian.....	3,0
Pulv. rad. liquir.....	2,5

M. f. pil. No. C. D. S. 1-2 pills 3 times daily after meals.

This tonic treatment is again followed by the administration of anti-syphilitics, which should be continued with interruption for some years after all symptoms have definitely disappeared.

In most cases the inunctions are the best method of administering mercury, but occasionally an even more energetic treatment becomes necessary, and for such cases intramuscular injections may be tried. Finally, we have a still more effective method of getting the drug into the circulation, by injecting corrosive sublimate directly into the veins, as has recently been recommended by Baccelli.²⁰ My experience with this form of treatment is a limited one as yet, as I have used it in only one case of spinal and six cases

of cerebral or cerebro-spinal syphilis. But the results thus far obtained have, in the majority of instances, been very favorable. I have already mentioned a case of syphilitic hemiplegia in which Baccelli's treatment had a better effect than I had ever seen under any other treatment, and should only like to add that it caused marked improvement in another case of cerebral syphilis, in which the disease had been progressive in spite of iodides, inunctions, and intramuscular injections.

When the patient's stomach refuses to stand the iodides they must be given *per rectum*.

During this treatment the patient should have rest, both mental and physical, and must abstain entirely from alcohol and almost entirely from coffee, tea, and tobacco. He must live regularly, avoid all excitement as far as possible, and take plain and nourishing food.

In some instances the application of sinapisms and vesicatories or of the actual cautery may prove useful.

The most important point in the treatment of these cases is, as I have already stated, that it be both energetic and prolonged. If this rule is followed our efforts will be crowned by success in a large number of cases.

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