

so much so that no differential diagnosis was made. No doubt, careful examination of the heart would have called attention away from the other symptoms, at least temporarily; yet even if the signs of valvular disease and enlargement had been discovered, they might not have been brought into connection with the fever, for at that time the symptoms of sepsis in general and of septic endocarditis in particular were even less known than they are at present. In both of the last two cases the intermittent fever had a duration of many months, but as the temperature was not recorded it is impossible to know the details.

The cause of the peculiar temperature curve in this disease is not known. It will be remembered that Cohnheim accurately explained the cause of intermittence in malaria as being due to the nature of the infecting agent, as we now know to be the case. Cohnheim thought that the intermittence of pyemic and septic fever was due rather to an intermittent intoxication from a continuous source: "the fever is not continuous, because such foci do not produce fever *per se*, but only because their constituents enter the circulation. This is not necessarily continuous, but may be influenced by various circumstances."² In cases such as those here reported this explanation does not seem tenable. It is difficult to imagine that the poisons elaborated in the vegetations enter the circulation intermittently as supposed by Cohnheim, but more reasonable to believe, as was suggested by Murchison in his classical article on the subject³ and expressed by Musser in his valuable contribution,⁴ that the "phenomenon of intermittency is due to rhythmical responses of the nervous system to a constantly-acting poisoned blood."

While the examination of the blood in such cases is the most certain element in the exclusion of malaria, other diagnostic differences are illustrated by the histories given above. One of the most striking symptoms in the cases seen by me was a marked weakness, a constant fatigue. In Case I the patient felt as well as she could wish during the apyrexia, but she was too weak to do anything. This is in marked contrast to malaria where, even if the temperature goes one or two degrees higher than it did in this case for many days, the patient not only feels well in the interval, but is actually able to do a considerable amount of manual or mental labor until advanced anemia prevents him. As regards the characteristics of the fever itself, the temperature is not so high as is common in malaria, and I do not think the other symptoms of the attack are usually as marked as they are in malarial fever with a similar temperature.

HOSPITAL ADVERTISEMENTS.—The *London Times* of July 23, 1895, contains the following:

Anybody in London having spare time on Monday, 22d, or Tuesday, 23d, July, is invited to visit the Poplar Hospital for Accidents between 2 and 7 o'clock.

Newly built. Newly fitted. No debt. No horrors. No infection.

Best Way.—Drive or bicycle, forty-five minutes from West End.

Another Way.—Blackwall Omnibus from Piccadilly Circus, seventy-five minutes.

Another Way.—Train to Aldgate, thence by yellow tram.

² Vorlesungen über allg. Pathologie, 2 Aufl., ii Bd., p. 558.

³ *Lancet*, 1879, vol. i, pp. 417, 453.

⁴ On Paroxysmal Fever—*not Malarial*, 1884.

THE DIAGNOSIS OF PACHYMEMINGITIS INTERNA HEMORRHAGICA.¹

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IN making use of the term "Pachymeningitis interna hemorrhagica" I do not intend to imply belief in any theory of the pathology of the condition to which this name has been applied. I have only used it as a common and convenient designation for a well-known condition.

In this short paper I have no intention of entering into the etiology or pathology of this affection. While the exact method of production of the membranes is still under discussion and cannot be considered as absolutely settled, it, nevertheless, seems to me that the weight of evidence and probability is in favor of the view that the hemorrhage is primary and that the origin of the membranes is not inflammatory. In other words, this affection should be classed as one of the many forms of intracranial hemorrhage.

Of this condition itself there are several varieties, varying in their etiology and the conditions under which they occur.

First, we have the more or less pure traumatic cases in well-grown children or adults, in which trauma is undoubtedly the exciting cause of the hemorrhage, whatever may have been the pre-existing conditions. We ourselves believe that dural hemorrhage may occur in such cases from a normal dura and without any pre-existing membrane.

Secondly, we have those cases which occur in infants and which are undoubtedly due in most, if not all, cases to continued pressure against the cranium during birth or to other similar traumatic causes. These cases may be noticed immediately after birth, or, they may not be detected until some weeks or months later, and, again, probably a very large proportion of these cases which are not fatal remain unrecognized by the ordinary physician or even by the specialist.

The third form of hemorrhages from the dura or from its derivative membranes is that to which the term "pachymeningitis interna hemorrhagica" has been more especially applied. This is an apparently spontaneous, idiopathic, non-traumatic affection occurring in adults and, more especially, in those in advanced life. It is largely confined to those in whom some chronic cerebral disease exists and those in whom there is some weakening of the intracranial or meningeal blood-vessels. It is a condition found principally in the chronic insane, in persons affected with paralytic dementia, or in those who are suffering from chronic alcoholism.

It is this form only of this affection which I propose to consider to-day. As seen by the general practitioner and in the general hospitals it is undoubtedly rare, and even in its more severe forms is probably often unrecognized. Gowers says "that during forty years the (London) Pathological Society has received no specimen from any London hospital."

Osler states that during eight years no case was seen in the post-mortem room of the General Hospital of Montreal, while he himself had been interested in pathology for fourteen years before he saw a case.

On the other hand, at the Philadelphia Hospital it

¹ Read before the American Neurological Association, June 7, 1895.

is seen two or three times a month, usually in patients from the Department for the Insane (Osler). Wigglesworth found 42 specimens in the insane from 400 unselected autopsies. Bondurant, out of 92 autopsies at the Alabama Insane Hospital, had eight cases.

The diagnosis of this form of this affection varies according to the amount of the hemorrhage, its rapidity and other conditions. In those cases in which the hemorrhage has been slight and in which after death only membranes with or without traces of hemorrhage are to be found, the diagnosis during life is, as a rule, with our present knowledge impossible. I firmly believe, however, that in many cases with more exact and careful study and observation of the physical conditions of the chronic insane, we shall be able to find guides to the existence of this condition during the life of the patient and be able to weigh the probabilities of its existence in special cases.

In the cases where the hemorrhage is of moderate amount or where it is profuse, the diagnosis, although always difficult, is more easy. This is especially the case where we have several hemorrhages within short periods of each other.

Where the patient is insane or demented, the symptoms of the hemorrhage, even when considerable in amount, may be so masked by the insanity or dementia as to pass unnoticed. The insane or the demented frequently do not mention and perhaps do not realize the ordinary sensations, so that for the purposes of clinical diagnosis they must be placed in the same category as infants unable to give expression to their feelings. In some ways, indeed, they are even less to be relied upon than infants, for the latter can express their pain in some unmistakable manner, although they cannot describe it, while the demented may not even give expression to pain. Nevertheless, it is probable that even in the demented a closer and more accurate observation will enable us often to diagnose, or at least to suspect, this condition.

It is, however, in the more simple and evident cases that the diagnosis should be made by every competent specialist.

The symptoms on which we must rely are in the more severe cases those of intracranial hemorrhage. Our principal care is to distinguish this from the other forms of intracranial hemorrhage.

In the first place, the form of this affection which we are now considering is found largely in adults who have passed the age of forty-five, and more especially in those, not insane or demented, who have passed the age of sixty. It is especially common among the chronic insane and in paralytic dementia. It is found not rarely in chronic alcoholism. When, therefore, apoplectic symptoms occur in paralytic demented or in the chronic insane, we should bear in mind the possibility that the hemorrhage may be of this character, whatever the age of the patient. The same holds good, though to a lesser degree, in regard to the chronic alcoholics, and in them it also is to be distinguished from the acute edema of the brain. As shrinking or atrophy of the brain, together with disease of the walls of the blood-vessels, appear to be important factors in the production of subdural hemorrhage, we are justified in being on the watch for it wherever these conditions occur.

Brain atrophy or shrinkage, when it has lasted for a considerable period, seems to produce a strong ten-

dency to this affection. The same cannot be said of the weakening of the walls of the intracranial blood-vessels alone, because if they are weakened, as is usually the case, especially at the base or throughout the intracranial cavity, the hemorrhage is likely to occur in other places than beneath the dura. If, however, weakening of the walls of the blood-vessels occurs in combination with other causes which lay special strain upon the meningeal vessels, we are probably more likely to have subdural hemorrhage than where the vessel-walls have their normal resistance. It is this combination of unfavorable conditions which seems to produce at times this form of hemorrhage in chronic alcoholism. When for any reason there is special strain upon the meningeal blood-vessels and when their resisting powers are not great, an agent which under normal conditions might not be sufficient to produce serious results may now cause this affection. Thus, blows on the head, apparently not so severe as to cause trouble in the healthy or normal, may in the class of persons mentioned serve as the cause of subdural hemorrhages.

Subdural hemorrhages in the adult are to be distinguished from other intracranial hemorrhages also by the character of the symptoms. In the non-traumatic form they are apt to appear rather more slowly than intracerebral hemorrhages. In many cases the patient at first has only more or less vague symptoms pointing to the head, general confusion, stupidity and drowsiness. Sometimes severe headache occurs, but this is not invariably the case. Gradually, in the course of some hours or two or three days, the patient becomes more drowsy, unconscious, and general convulsions or localized twitchings occur.

Paralysis may or may not be present, but is rather apt to be a late symptom. Contraction of one or more limbs is not rare and is characteristic.

The most important symptom, as regards diagnosis, is the late appearance of the paralysis. There is no other ordinary form of intracranial hemorrhage in which the patient so gradually loses consciousness, and in which the paralysis (hemiplegia) comes on so long after the onset of the first symptoms. This may occur in ingravescant apoplexy where the hemorrhage is intracerebral, but this condition is not common and may be distinguished in other ways. On the other hand, we must remember that the paralysis does not always come late in this affection. It may occur early, or it may be already present when the final attack occurs.

This brings us to the second symptom of value in differentiation, repetition or multiplicity of attacks. When a patient has one attack following another, especially when the second occurs very shortly after the first, this form of trouble should be considered. If in both attacks the symptoms have come on gradually, we have strong evidence of subdural hemorrhage.

A marked characteristic of the actual symptoms of subdural hemorrhage is the preponderance of the irritative symptoms. A large proportion of the patients have either general convulsions of an epileptiform character or localized clonic spasms or twitchings of a portion of the face or one or more limbs. These symptoms occur early, and are apt to continue until the late symptoms — those of compression — appear. More characteristic than anything else is the existence of early stiffness and rigidity in one or more limbs.

This apparently in many cases precedes any marked

paralysis of the affected limb. When it exists it is almost diagnostic of this condition.

As is apt to be the case in many irritative conditions, the pupils, especially in the early stage, are frequently contracted. In many cases, however, they are unaffected, and are equal and normal. Fraenkel has called attention to the absence of affections of the cranial nerves in this form of hemorrhage, due to the fact that the blood does not reach the base of the skull, and hence does not exert pressure upon them.

We may, then, sum up the points of differential diagnosis between idiopathic subdural hemorrhage in the adult and the other forms of intracranial hemorrhage as follows:

(1) Subdural hemorrhage is peculiarly common in paralytic demented and in the chronic insane, and it is not rare in chronic alcoholics.

(2) In many cases its onset is more gradual than in ordinary intracerebral hemorrhage, and the irritative stage lasts an unusually long time.

(3) Irritative symptoms are prominent. General epileptiform convulsions and localized convulsive movements are apt to occur.

(4) The peculiar rigidity localized in one limb, when occurring in connection with symptoms of hemorrhage and where no affection like tubercular meningitis exists, is almost pathognomonic.

(5) The absence of affections of the cranial nerves is to be considered as in favor of this form of trouble.

It must not be forgotten, in making our diagnosis, that in many cases subdural hemorrhages have been found in company with intracerebral hemorrhages, either old or recent.

The great importance of the diagnosis in these cases of subdural hemorrhages lies in the fact that many of them are probably susceptible to proper treatment, and their immediate fatal effects can be prevented. We cannot probably as yet prevent the recurrence of new hemorrhages later.

To illustrate my meaning, I will relate the following case which occurred in my service at the Carney Hospital:

On the 10th of May, 1893, the patient, a man about sixty-five years of age, was brought into the hospital unconscious, and without any history except that he had been for several days in his present condition. He now lies in bed, stupid, somnolent, unable to answer questions, more or less restless at times and delirious. He moves all his limbs, and occasionally throws himself about on the bed.

Physical examination shows a drooping of the right eyelid and a divergence of the right eye. He cannot be induced to protrude his tongue. There is free voluntary movement of all the limbs, but the left upper extremity seems stronger than the right. The grasp is fair on both sides. On account of his mental condition sensation cannot be fully tested: responses to stimuli are everywhere diminished, but more on the right trunk, extremities and face than on the left. The knee-jerks are absent. There is no tenderness about the calves or tibia. The urine contains a slight trace of albumin and some hyalin and fine granular casts. Heart negative.

During the course of the day we obtained the following facts: The patient had used considerable alcohol for the past three years. He had, however, been in fairly good health, and had worked up to eight days ago. For some years he had occasional

attacks of rheumatism. On the 3d (seven days ago), Sunday, he fell down unconscious. On the 5th, he was better, and recognized his sister. At this time there was partial paralysis of the right limbs, which gradually largely disappeared.

On May 11th, his second day in the hospital, I found him very restless, pulling about the bed-clothes and any other objects he could reach with the left hand. There was incontinence of urine; no movement of the bowels since entrance. The right eye was now turned upwards and outwards, the pupil of medium size. The left eye was turned upwards and outwards, the pupil smaller than the right. The important symptom, however, was the appearance of a marked right hemiplegia of the extremities, the right upper extremity being apparently totally paralyzed; the right lower extremity largely so. Sensation over the right extremities was much diminished. I advised immediate operation as soon as permission of friends could be obtained.

Operation performed by Dr. John C. Munro about 4.30 P. M. Patient had Cheyne-Stokes respiration, and was almost moribund. The cranium was trephined just in front of the left parietal eminence, and an immense clot was found underneath the dura. The opening was enlarged and the clot removed. It extended from the anterior lobe backwards over the occipital, the thickest portion being as usual over the vertex and just posterior to the motor region. After removal of the immense clot, which was an inch or more in thickness at the thickest part, the false membrane was plainly visible.

At the end of the operation the condition of the patient was greatly improved as regards respiration and pulse. On the following morning he again developed Cheyne-Stokes respiration, and he died something more than twenty-four hours after the operation.

Although in this case the operation was not successful in saving life, it materially improved the condition of the patient for the time; and had we possessed data sufficient to justify operation earlier, there was a fair prospect that the patient's life might have been saved.

The proper treatment for subdural hemorrhage of any considerable size is trephining and removal of the clot. The operation is comparatively simple, and the danger to the patient slight and not to be considered in comparison with the risk of allowing the clot to remain. It is probable that removal of the false membrane, so far as it can be reached, is always advisable.

I am not aware that this operation has been performed before in these cases, although I know that it has been proposed.

THE DRUG TRADE IN THE UNITED STATES.—According to the *Pharmaceutical Era*, there are 36,352 retail drug stores in the United States, the ratio of population to each being 1,199, taking the figures of the 1890 census as a basis. It is estimated that in all probability there are 50,000 registered pharmacists, assistants, etc., employed in these stores. It is also estimated that there are in the United States over 2,000 establishments, with a capital of more than \$100,000,000 engaged in the manufacture of drugs and chemicals.