

LESIONS OF THE OPTIC CHIASM, WITH A CLINICAL
REPORT OF THREE CASES.*

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These three patients with hemianopsia are presented in clinical illustration of lesions involving the optic chiasm.

Case I. Partial blindness with atrophy of both optic nerves. Bitemporal hemianopsia. No other symptoms of cerebral disease. Hemipic pupillary inaction in the left eye.

H. K., born in the United States, 38 years of age, floor-walker in a drygoods store, was referred to me by Dr. P. A. Callan, October 14, 1899. He has been married 14 years, and has two healthy children. His wife has never aborted. During the last 8 years he has had two attacks of biliary colic. The last attack occurred 4 years ago. In both, gall-stones were passed through the intestine. One year ago he first noticed dimness of light at night. Last May there was difficulty in reading. Since then his vision has been failing rapidly. No headache; no diplopia. Bowels are regular, appetite good, and he sleeps well. No history of rheumatism, alcoholism or injury to the head. He denies syphilitic infection. He is gaining in weight. His wife says there is no change in his mental condition and that his memory is excellent. Family history unimportant.

The right pupil is larger than the left. Right = 5 mm. Left = 4 mm. Both react normally to light, and in convergence. Consensual reaction is feeble. Vision R. E. = 20-200 L. = 20-100. No central color scotoma. There is bitemporal hemianopsia for white, form, and colors; the vertical line passing outside and around the fixation point. In each temporal field for white, there are several islets in which perception is intact. There is some contraction of the remaining nasal fields both for form and color, this being more pronounced in the right eye, as illustrated in the accompanying chart.

Hemipic pupillary inaction is present in the left eye. The ophthalmoscope shows optic atrophy on both sides.

Gait and station are normal. All reflexes are present and are normal. No objective sensory disturbance. Senses of smell and taste are unimpaired. No evidence of acromegaly.

*Read at a meeting of the Section on Ophthalmology of the New York Academy of Medicine, January 15, 1900.

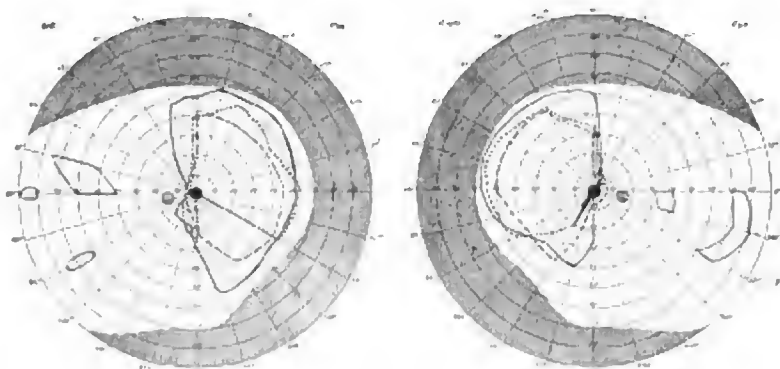
Further examination as to signs of disease of the nervous system or somatic indications of syphilis proves absolutely negative. Analysis of urine reveals nothing abnormal.

Diagnosis.—Lesion of the optic chiasm destroying both fasciculi cruciati.

Treatment with iodide of potassium, galvanism, and strychnine subcutaneously have all failed to make any improvement.

At the last examination a few days ago the visual acuity and the fields have diminished, as shown in the charts.

His general health, however, is perfect.



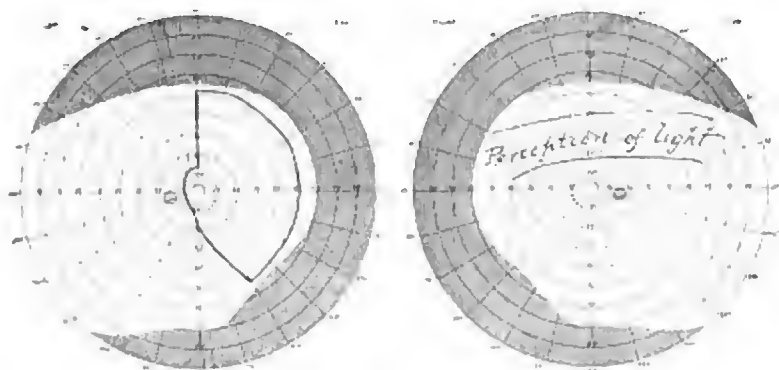
Case I. Lesion limited to optic chiasm, Jan., 1900.

— field for white. ***** field for red. - - - field for green.

Case II. Loss of vision in right eye. Temporal hemianopsia with left eye. Atrophy of both optic nerves. No other symptoms of cerebral lesion.

J. S., born in Russia, 28 years of age, sewing machine operator, was sent to me by Dr. Cole of this city, September 22, 1898. He was always well until two years ago, when he was shocked at seeing a child run over and killed. For some weeks afterwards he remained nervous and apprehensive. Two weeks after witnessing this accident his vision began to fail, and now the right eye is blind. About a year ago he first noticed that he could not see toward the right with the right eye, and about two months later, the left eye was similarly affected, *i. e.*, he could not see toward the left without turning his head. About four months after the "fright" on

awaking in the morning after a good night's sleep, he was unable to raise his head on account of severe vertigo. This was increased by the slightest movement of the head. There was neither vomiting nor headache. He was confined to the bed two days. On the third day he was quite well again and returned to work. Three weeks later he had another similar attack lasting two days. He has had two milder attacks since, the latter having occurred nine months ago. Last November (ten months ago) he had acute purulent otitis affecting both ears. The discharge ceased in about a week, and he has had no further trouble. He has never suffered



Case II. Lesion of optic chiasm, Sept., 1898.

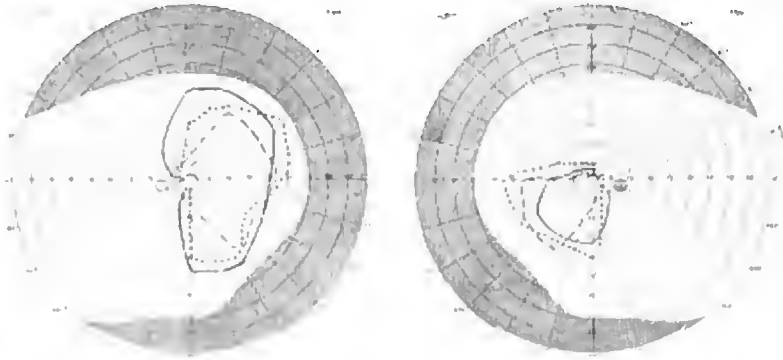
from headache, vomiting or diplopia. No injury of the head. No alcoholism or rheumatism. No history of syphilis. He has three healthy children and his wife has never aborted. He has been moderate sexually. Bowels are regular and appetite is good. He sleeps well. In fact, he says he is in perfect health save the trouble with his eyesight. Family history unimportant.

Pupils.—Right 4 mm. Left 4.5 mm. Right reacts feebly to direct illumination. Consensual reaction +. In convergence normal. Left, normal. Power of convergence is feeble; otherwise no muscular weakness. Vision, R = perception of light. Left = 20-100, with temporal hemianopsia, the vertical line of division passing around and outside of the point of fixation, part of the lower quadrant of remaining field being lost, as shown in the accompanying chart.

Ophthalmoscope reveals atrophy of both optic nerves. Sense of smell and sense of taste are normal. No motor or sensory disturbance. All reflexes are present and normal. Neurological examination otherwise absolutely negative. The urine shows nothing abnormal. Pulse 96, but regular. Heart and lungs present no signs of disease. No evidence of acromegaly.

Diagnosis.—Lesion of the optic chiasm destroying both fasciculi of the right optic nerve and the fasciculus cruciatus of the left eye.

He remained under my observation for three weeks, and then disappeared, but he returned to me a few weeks after



Case III. Lesion of optic chiasm associated with acromegaly, Oct., 1899.

—— field for white. * * * field for red. - - - field for green.

a year's absence. During this period he was under treatment at various ophthalmological and neurological clinics, receiving large doses of iodide of potassium, strychnine, etc. Now he is almost totally blind, being able only to indistinctly discern shadows and occasionally count fingers at about two feet. He has never complained of headache, and his general health is perfect.

Case III. Acromegaly. Partial blindness of right eye, with atrophy of optic nerve. Bitemporal hemianopsia, plus the loss of superior nasal quadrant of right field.

Mrs. K. W., born in the United States, 40 years of age, widow, was referred to me by Dr. N. J. Hepburn, October 12, 1899. Five years ago she had the grippe, the attack last-

ing three weeks. The symptoms were severe general headache, fever and pains in the extremities. She then noticed for the first time that vision was failing, and for awhile she was unable to read or sew on account of diplopia and vertigo. During the last three years she has suffered almost continuously from headache, which extends to the back of the neck. It is worse in the morning, but diminishes toward afternoon. Vision has gradually become worse until the right eye is nearly blind. Three years ago she noticed that she could not see toward either temporal side without turning her head. She now complains of headache and vertigo. She has never been pregnant. Menses are regular. Menorrhagia lasting eight days, and frequent leucorrhea. Always constipated unless she resorts to drugs. Flatulent dyspepsia. She also complains of occasional darting pains in the arms and legs, and edema of the feet and ankles. Formerly she was a very light sleeper. Now she sleeps soundly, and there is some somnolence during the day. Her face, hands and feet have grown larger. Three years ago she wore gloves size $6\frac{1}{2}$; now she requires size $7\frac{1}{2}$. Formerly she wore shoes number 5; now she wears number 6. The hands and finger-joints are stiff and numb in the morning. She perspires readily. Her memory is somewhat poorer than a few years ago. During the last two years she passes a large quantity of urine daily. She is the youngest of nine sisters and three brothers. Three sisters, aged 14, 28 and 38 years, respectively, and one brother at 40 died of pulmonary tuberculosis. One sister, aged 30, died of renal disease, and another sister died during infancy. Two brothers and three sisters are living. The men in the family are healthy. One sister has pulmonary tuberculosis, another has chronic rheumatism, and the other has some eye trouble. Her mother died at 40 of paralysis. Father died at 86 of pneumonia.

Pupils equal at 3.5 mm. Right reacts feebly to light. Consensual +. Convergence —. Left, normal to light. Consensual and Convergence —. Vision, R. E. = 7-200. L. E. = 20-20 +. There is bitemporal hemianopsia for form and colors. In the *left* eye, the remaining portion of the field is concentrically contracted. In the *right* eye, only the inferior nasal quadrant is preserved, and that is contracted, as shown in accompanying chart. (See Chart III.) Ophthalmoscope shows right optic atrophy. She presents a clear clinical picture of acromegaly, as seen in the formation of the face, and the enlargement of the tongue, hands and feet, etc. Senses of smell and taste are normal. Thyroid not enlarged. Pulse 84 to 96, and weak. Heart's action

normal, save accentuation of aortic second sound. Lungs normal. No tremor. Muscular power in extremities good. Knee-jerks and other reflexes normal. Examination of urine negative.

Diagnosis.—Acromegaly, with lesion of the optic chiasm from pressure of enlarged pre-hypophysis, destroying both fasciculi cruciati and the superior half of the fasciculus lateralis of the right eye.

In another case of acromegaly recently reported by the writer¹, the patient having been shown before this society last March, bitemporal hemianopsia was also present as a result of pressure on the chiasm by the hypertrophied pre-hypophysis. This patient died during the summer, but there was no autopsy.

Since the publication in 1881 of Wilbrand's classical monograph on hemianopsia there has been comparatively little advance in our knowledge regarding the subject of chiasm lesions, with the exception of Marie's description of acromegaly in 1886, and the incidental elaboration of the eye-symptoms in connection with the associated involvement of the pituitary gland.

Wilbrand collected and recorded 56 cases of chiasm-lesion with autopsy. This interesting report clearly demonstrates that disease of the chiasm is most frequently secondary, being dependent upon tumor originating in the adjacent intra-cranial structures. In 45 cases the tumor was located as follows:

| | |
|-----------------------------------|----|
| Sella turcica | 15 |
| Hypophysis cerebri | 11 |
| In the chiasm..... | 6 |
| Floor of the third ventricle..... | 5 |
| Crista galli | 4 |
| Base of skull..... | 3 |
| Posterior perforated space..... | 1 |

In 11 cases:

| | |
|--|---|
| Dilatation of the third ventricle from internal hydrocephalus | 3 |
| Gumma of chiasm..... | 3 |
| Tubercle of chiasm..... | 3 |
| Tubercular caries of base of skull..... | 1 |
| Extension of proliferation from a tumor of the optic nerve in the orbit..... | 1 |

¹ Phila. Med. Journal, Oct. 7, 1899.

Four additional cases were each due respectively to periostitis, partial meningitis, cysticercus, and aneurism of the internal carotid artery.

In all of these cases the collateral symptoms were unmistakably indicative of intracranial disease; either meningitis or tumor formation.

In 1894 Sell² collected and reported 81 additional cases with lesion of the optic chiasm published since Wilbrand's article. From an etiological standpoint, the general character of the cases in this series corresponds with those of Wilbrand. Twenty per cent. were due to syphilis.

When lesions involve the optic chiasm, the prognosis as to the duration of life and the preservation of vision, necessarily depends upon the extent and character of the pathological process. There is a class of cases, however, in which the disease seems to be limited to the chiasm, the condition being ascribed to a local meningitis or periostitis, or to a permanent and non-progressive exostosis. This circumscribed lesion may gradually cause complete blindness of both eyes without any other discoverable symptom. Such individuals have been known to remain blind, with no further discomfort or additional manifestation attributable to cerebral disease.

I have shown two patients of this kind here to-night, and the late Dr. E. C. Seguin³ published a report of three similar cases in 1887. I had the opportunity of examining two of them, and they presented all of the characteristics of this type. There was neither history nor evidence of syphilis or injury to the head, nor any disturbance of the general health.

It is well known that the interpeduncular space is the principal and favorite location of syphilitic basal meningitis; hence the frequent involvement of the third nerve and the other nerves to the eye-muscles, and also the optic nerves.

Oppenheim has shown that bitemporal hemianopsia may arise from such involvement of the middle portion of the chiasm. This hemianopsia may exist for a long time without any ophthalmoscopic changes. In 1886 he⁴ reported a remark-

² Inaug. Dissert., Leipzig (Jahresbericht der Ophthal., 1894, v. 25, p. 174).

³ Journ. NERV. & MENT. DIS., Vol. XIV.

⁴ "Syph. Erkr. d. Gehirns," 1896.

able case of gummatous basal meningitis, with autopsy, in which the process had extended to the chiasm. There had been bitemporal hemianopsia, which had varied from time to time and had gradually disappeared, leaving a normal field. He thinks this changeability of the field is characteristic of syphilitic disease implicating the chiasm.

Since then several other cases have been reported. Such a possibility should always be borne in mind, for it becomes a very important element in prognosis.

It will thus be seen that chiasm lesions may be divided into four classes:

1. Associated with intracranial growths and their concomitant symptomatology.
2. From enlargement of the pre-hypophysis cerebri, as occurring in acromegaly.
3. In syphilitic basal meningitis.
4. From a circumscribed pathological process, which gradually produces complete atrophy of both optic nerves, without any cerebral symptoms whatever.

In the absence of evidence of papillitis in the cases of Class IV, it would seem that the nerve structure undergoes a slow degeneration due to gradual and persistent pressure, thus obliterating its conductivity, and this is probably the result of an adjacent local inflammatory process.

Of course, in the absence of post-mortem findings, it would be mere speculation to speak with any degree of definiteness as to the nature of the primary lesion in these cases. At any rate, whatever it be, it invariably terminates in progressive and permanent destruction of both optic nerves.

Without a careful perimetric examination of the visual fields the localization of lesions in the optic chiasm would be impossible.