

Pooley (J. R.)
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OF THE

CHOROID.

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PERMANENT MEMBER OF THE MEDICAL SOCIETY OF THE STATE OF
NEW YORK.



Re-Printed from the Transactions of the Medical Society of the State of New York for 1883.

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CASES OF RUPTURE OF THE CHOROID.

In my note-book representing ten years of private practice, occur eight cases of rupture of the choroid, from which I select the following six :—

CASE I, Fig. 1.—The patient, a man of German birth, aged thirty-four, consulted me January 12, 1875, on account of failing sight in both eyes, but more especially the right, in regard to which he gave the following history. The spring before, he was struck upon it by a missile thrown with great force. He was rendered unconscious for a few minutes by the blow, and for some time after could not see. His sight, however, gradually returned to some extent, and then he noticed that objects appeared crooked and distorted (metamorphopsia).

Soon after the injury, before he consulted me in my office, he was at the Clinic of the Ophthalmic and Aural Institute, and on his card the diagnosis of atrophy of the optic nerves and hemorrhage at the macula was written. The right eye was divergent; its vision = $\frac{20}{200}$. The left, $\frac{20}{10}$; refraction emmetropic. He was blind for green and blue colors.

Ophthalmoscopic examination of the right, showed the appearance delineated in Fig. 1. A curved or crescentic white streak, located between the optic disc and macula, almost in the exact region of the latter, and with its concavity turned toward the disc, about $1\frac{1}{2}$ D. in length, and $\frac{1}{4}$ D.* in breadth, at its widest part. Its edges made sharp irregular lines, and both the edges and middle at about the center were dotted by black pigment. The small vessels of the retina, which are not numerous in the macula region, passed in an uninterrupted course over the rent. There was not observed, as is often seen,

* D is to signify a unit in ophthalmoscopic measurement, and equals one diameter of the optic disc.

any considerable secondary changes in the choroid. The optic disc in this eye, as well as in the other, showed a moderate amount of atrophy, such as is seen as resulting from the abuse of alcohol and tobacco, to both of which the patient owned up.

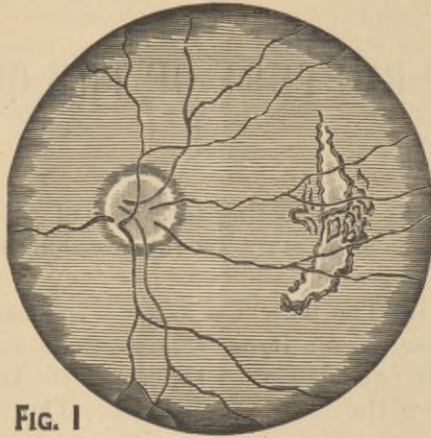


FIG. I

In this case we have a fair example of the ophthalmoscopic appearances which rupture of the choroid usually presents; a crescent-shaped white streak on the temporal side of the optic disc.

The diagnosis of hemorrhage at the macula made at the time of his visit to the Clinic, was quite excusable. That such extravasations of blood occur immediately after the injury to almost any extent, is well-known; and later on I shall report a case in which the diagnosis was masked by such an occurrence. The hemorrhage may indeed be enough to find its way into the vitreous, and by causing its turbidity, interfere with the ophthalmoscopic examination.

The occurrence of distorted vision—*metamorphopsia*—as a permanent condition, quite often happens after this form of injury; and, as pointed out by Knapp,* is especially likely to occur after the sight has temporarily improved, and is due to the contraction of the cicatritial tissue formed in the choroidal rent.

The retina may be united to it, drawn backward and united to the sclerotic. Then the normal distribution of the retinal elements, which are of a mosaic-like character, become

* Archives of Ophthalmology, Vol. I.

changed; and their previous regular retinal meridians are dislocated, so as to produce secondary curves. If they do not lose their functional power, metamorphopsia results; but when the sensory elements involved in the scar are destroyed, a corresponding dark place in the visual field—scotoma—results.

That such defects of vision should occur from such an injury is not, as Knapp truly says, so remarkable as that, in some cases, vision is but little interfered with.

CASE II, is one of which I have very imperfect notes, as I saw it during a visit to Columbus, and only brought home the sketch with a record of the sight, etc. It is shown in Fig. 2, and occurred in a medical student of twenty-one years, seen March 2, 1877. The rupture is drawn in the inverted image.

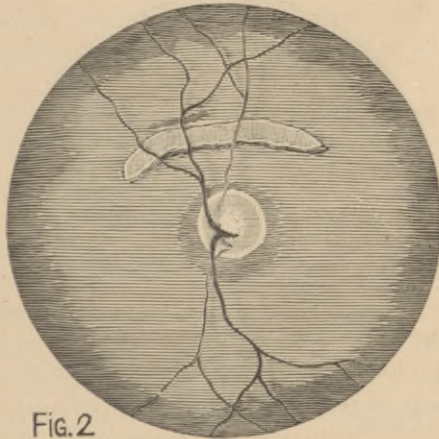


Fig. 2

The injury was caused by a blow upon the eye received five years before. The eye diverged slightly, and sight was very bad, only $\frac{5}{200}$. There was no scotoma nor metamorphopsia.

The ophthalmoscope showed a white, slightly crescentic patch with the concavity turned toward the optic disc about the same (rather smaller) dimensions as in Case I, situated above and about $\frac{1}{2}$ D. from the upper margin (inverted image) of the disc. It lies somewhat obliquely, its inner end near the nasal side of the disc. There was quite an extensive amount of rarefaction of the choroid observed, toward the equator of the eye, not shown in the picture; the nerve was white, and the arteries small—atrophy of the disc.

The case differs from the first mainly in the situation of the rupture, and in the absence of either scotoma or metamor-

phopsia. The great loss of acuteness of vision we must attribute to the atrophy of the nerve, since a rupture of the extent here depicted in such a situation, where the integrity of central vision could be but little impaired, could hardly be held responsible for it. It is therefore probable that the blow causing the rupture may have in some way (as, for instance, by fracture of the orbit, or hemorrhage therein) compressed the nerve, causing it to undergo atrophic change.

It may be observed that the atrophy of the disc is not very well shown in the drawing. It will be seen, too, that the loss of vision here was much greater than in Case I, where the rupture was at the macula.

CASE III.—F. G., Fig. 3, a lad of fourteen years, from South

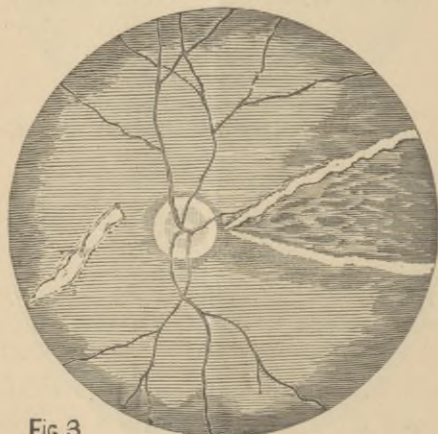


Fig. 3

Carolina, a student at the St. John's College, Fordham, consulted me May 31, 1877, on account of the bad vision of his right eye. One year before, he was struck upon this eye by a tip-cat. He says that the eye was black and blue, and somewhat painful for a few days. He noticed no affection of sight until about one month before his visit to me, when by accidentally shutting the left eye, he found vision almost entirely wanting in the upper part of the right. The blindness has gradually encroached upon the rest of the visual field, until at the time I examined him, he said he could only see in its outer part. The ophthalmoscope showed, between the macula and disc, two linear white streaks beginning close to the latter, and running in two horizontal, almost parallel branches to the extreme periphery of the fundus; the upper one having a some-

what curved direction with its convexity looking upwards. The lower one had a much straighter course. They were not united by a transverse fissure, but were disconnected at their ends; the upper streak lying closest to the disc, as is shown in the drawing. The streaks were very narrow, not more than $\frac{1}{3}$ or $\frac{1}{4}$ D. wide. Their borders were irregular, and were, especially the upper ones, pigmented. The space included between the rupture showed pigmentation and rarefaction of the choroid. To the nasal side was another rupture running obliquely from above downwards; its upper edge about $\frac{1}{3}$ D. from the disc, 2 D. in length and $\frac{1}{3}$ D. in width; somewhat linear in shape, the upper end slightly bifurcated, the lower drawn out to a point; along its borders, and in the center of the gap, a collection of pigment spots. The vessels which could be traced to the locality of the choroidal defects, passed without any change of direction over them.

This case is interesting as showing the occurrence of three distinct rents of the choroid. Those running in a horizontal direction more or less parallel, are an example of the rarest form of choroidal rupture. Of interest, too, is the occurrence of another tear upon the opposite side of the disc. In this case, too, there was at first metamorphopsia, and then a large central scotoma. The sight, as mentioned may be the case, became worse by the contraction of the choroidal scar, causing at first metamorphopsia, and then scotoma; the effect of the contracting cicatritial tissue at first affecting only some of the retinal elements, later all those involved in the scar, and thus destroyed them to such an extent as to abolish their function. A remarkable feature of this case, but not without an analogue, is the insignificance of the symptoms produced by an injury sufficient to cause such serious mischief to the eye. It has been already pointed out by other observers that, although the choroid is a vascular membrane, the amount of hemorrhage caused by its rupture varies greatly. Certainly in this case it would appear that the sight could not have been very seriously impaired, or it would have been noticed soon after the injury. I have seen several cases where the primary results of the injury have been thought very little of.

The next two cases of choroidal rupture observed by me were of the usual linear-shaped white scars situated between

the optic disc and macula, and had no feature which make it worth the while to report them in detail; they were both examined a long time after the injury which gave rise to them, and in both the vision was considerably impaired; in the one instance $\frac{20}{200}$, in the other, only $\frac{5}{20}$. The latter case was discovered quite accidentally, the patient declaring that he had nothing the matter with his sight. Ophthalmoscopic examination, however, showed a typical rupture of the choroid, and when questioned, he remembered being struck on the eye some years ago with a snowball.

CASE VI, Fig. 4, is the only one which I have had the opportunity to observe soon after the injury. It is, too, by far the most extensive choroidal rupture I have seen myself, or know of as described. The patient was a boy of fourteen years, referred to me by Dr. Arango, his family physician, who was called to see him after the injury, and who was so good as to place the care of the case entirely in my hands. The day before I saw him he was struck upon the left eye, as was supposed, by a *stone* thrown from a sling, by one of his playmates.

The force of the blow was sufficient to cause him to fall, and remain for some minutes unconscious. The accident occurred in the Central Park, and he was taken to his home in the upper part of the city. Soon afterward he complained of great pain in the eye, and vomited several times. He could not see at all with the injured eye. When I examined him November 14th, there was some swelling of the lids, but no ecchymosis. The eye was intolerant of light, and there was a slight degree of circum-corneal injection. There was a moderate, somewhat irregular, dilatation of the pupil, a deep anterior chamber, but no tremulousness of the iris. Oblique illumination discovered the fact that there was a small detachment of the iris from its ciliary margin (iridodialysis) upward and outward, and that its pupillary margin was ruptured below and outward. The ophthalmoscopic examination, which was difficult on account of the irritability of the eye, showed the refractive media to be clear. Between the optic disc and the macula there was a considerable extravasation of blood into the retina, and also one patch of small size near the lower border of the optic disc. The retina in all its outer part was œdematous. Movements of the hand could be seen only on the temporal side. There was no pain. The diagnosis entered in my book was,

Œdema and hemorrhage of retina; probably caused by *rupture of the choroid*. The patient was confined to bed in a darkened room, six leeches put on the temple, a brisk cathartic given, mercurial ointment rubbed into his eyebrow, and a solution of atropine instilled three times a day.

November 23d.—Under this plan of treatment, the blood rapidly absorbed, and five days later, it was possible to see a large white patch in the fundus, with the borders still fringed by hemorrhage. I now made the positive diagnosis of rupture of the choroid, which up to this time had only been conjectural. His eye was, however, still rather irritable, and intolerant of light. While directing him to look strongly downward, in order to better see the extent of the rent in the choroid, a small, dark, roundish object came into view, which, on urging him to look still more downwards, fell on the bed. It was a buck-shot, which had been in this position between the lid and the eye since the date of the injury. Upon examining more carefully, I could see a distinct indentation in the globe, behind the equator, and about midway between the corneal margin and outer canthus. This was undoubtedly the foreign body which had inflicted the injury by striking the globe directly, and by the spasmodic action of the lids immediately following, been retained in this situation. He could now count fingers in the upper and temporal part of field. By the 12th of December, not quite one month after I had first examined him, the very extensive rupture in the choroid could be seen. The eye was now free from irritation, the pupil middle wide, atropine discontinued; with eccentric fixation fingers could be counted at 15' (4.6 meters.)

From this time on, there was gradual improvement; vision rose to $\frac{20}{30}$; and the extent and character of the choroidal rent became more distinctly visible. On January 3d, the drawing of the fundus, Fig. 4, was made; it is drawn as seen in the inverted image.

The drawing was carefully made, and is an exact representation of the ophthalmoscopic picture.

The laceration may, for convenience of description, be described as consisting of two parts, a perpendicular or transverse, and a horizontal one, which are, however, united into one. The transverse rupture is curved, with its concave surface turned towards the disc, and situated in the immediate

vicinity of the macula lutea. It is about 4 D. in length, and its mean breadth 1 D.; but its centre blends into the transverse rupture.

Its shape is very irregular, forming three notches above, and two processes or a single bifurcation below; besides this, there is still another notch or prolongation close to the transverse tear.

This transverse rent is continuous with a very much larger one running horizontally, and extending almost to the periphery

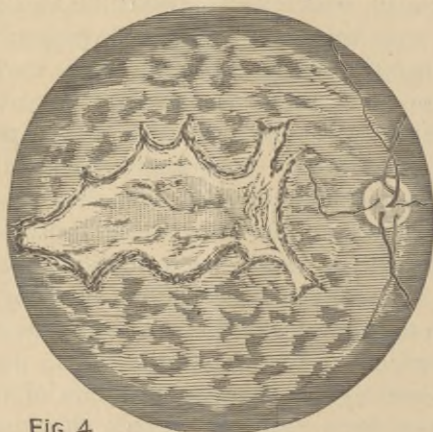


FIG. 4

of the fundus, where it ends abruptly. It is 6 D. in length and in its widest part 4 D. in breadth. Near the transverse tear it is narrower, but gradually widens out until about the middle of its course, when it again tapers out to become still narrower. The edges are irregular in outline, widely separated, and both the inner parts and margin covered with dark choroidal pigment.

The more central part of the surface is of a whitish-yellow, or gray color, while that nearer the margin is white. All the region above and below the rent, as well as between it and the disc, were strewn with irregular accumulations of very dark choroidal pigment heaps, while on the nasal side of the disc, the choroid looks quite normal.

Some fine blood vessels can be traced almost up to the margin of the transverse tear, but none were distinctly seen to traverse it.

By the most careful examination in both methods no blood-vessels could be seen upon the horizontal rupture, except on

the upper margin near its termination, where a single vessel runs for a short distance along it, and then on to the white surface of the rupture. This vessel could not be traced any farther, nor brought into connection with any other. From the behaviour of this blood-vessel and the wide gaping of the choroid, as well as its irregular borders, it may be inferred that the retina is also torn, but of this I could not make myself certain. Whether the retina is involved in the rent will perhaps become more apparent later, by the formation of new connective tissue at its margin; but for the present I must declare myself unable to speak positively on this point. The external appearances of the eye are now nearly normal; the small iridodialysis being covered by the lid, and the tear in the pupillary margin of the iris hardly visible except by minute inspection. The dilatation of the pupil, and the paralysis of accommodation which also existed, have both disappeared; the pupil is now of about the same size as the other. There is a central scotoma, and a large defect in the field of vision corresponding to the very extensive lesion. Tension of the eyeball is normal, and it is free from pain or injection.

This is by far the most extensive laceration of the choroid I have seen, and if we may judge of those reported by others from their descriptions and drawings, the largest hitherto described.

Although the eye is now free from irritation or pain, it is questionable whether such an extensive injury may not finally result in phthisis bulbi, or be followed by attacks of irritation, redness, and pain from trifling causes.

This case illustrates the difficulty which surrounds making a diagnosis, as to the exact nature of the injury, soon after its infliction. It is only by taking into account the clinical experiences of others, that one can feel moderately sure, that the extravasations of blood and opacity of the retina are consecutive to the choroidal rupture. Strictly speaking, the diagnosis of rupture of the choroid is not made, until it is seen with the ophthalmoscope, any more than the diagnosis of stone in the bladder is made, until the surgeon actually touches it with the point of his sound. There can be no room for doubt that, before the peculiar image, which this lesion presents with the ophthalmoscope, was first described by Von Graefe in 1854, many such

cases were recorded as traumatic irido-choroiditis, hemorrhage into the retina, and so on.

That the blow, which gave rise to such an extensive laceration, must have been very great in force, is shown by the rupture of the iris both at its attached and ciliary borders, as well as by the mydriasis and paralysis of accommodation, to say nothing of the temporarily grave constitutional disturbance produced by it.

In regard to the treatment, I may be allowed to say that the comparatively good recovery in this case may, perhaps, be in a measure attributed to the active treatment employed. Be that as it may, there can be no doubt in the unprejudiced mind as to the propriety of such treatment, when the result of the blow is apt to be followed by grave inflammatory symptoms in the iris, ciliary body, vitreous and choroid.

Knapp, in his paper already referred to, says positively: "Whenever such inflammatory changes, from whatever cause, have occurred, we deem it our duty to institute a serious treatment, of the usefulness of which every unprejudiced ophthalmic surgeon is satisfied. Why should it be inefficient or superfluous in cases where traumatic irido-choroiditis is complicated by rupture of the choroid?" Knapp indeed reports one case which terminated in complete recovery.

It would be going beyond the limits of this paper to enter into any discussion as to the theory of the mechanism of these choroidal ruptures. If any of my hearers are not familiar with the views advanced, I would refer them to Knapp's article in which he discusses this subject.

I will only add that in this case, the view entertained by Knapp, that the rupture takes place at a point opposite, or distant from the point of injury by *contre coup*, finds an exception, since the transverse part of the solution of continuity was near the point of injury, and might more properly be called direct or *immediate*, than by *contre coup*. I am, however, far from denying that this injury does occur as he suggests. May it not be, however, that when the force of impact from a small foreign body is directly on the globe, the injury is direct, and when the force of blow is transmitted, so as to overcome the elasticity of the membrane, it is received upon the bony surrounding of the eye, rather than directly upon the globe itself.

The retention so long in the cul-de-sac of the agent which

caused the injury remaining undiscovered until by accident it came to light, gave me no little chagrin. With that wisdom which comes from hind-thought rather than fore-thought, I now think that the absence of certain symptoms, when I first saw the case, should have led me to infer that the missile had struck the globe, and not the eyelids or surroundings of the eye. Had the latter been the case, there would almost certainly have been considerable swelling and discoloration of the eye; for we all know how easily a black and blue eye is induced, even by an inconsiderable violence.

If I had taken this fact into consideration, I should very likely have sought for and found the foreign body, which, however, did no harm by its residence for so long a time between the lid and eyeball.



