

SYMPATHETIC DISEASE.

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DIGEST OF THE LITERATURE.

SYMPATHETIC OPHTHALMITIS, PATHOLOGY. So-called neurotoxemia as a possible cause of sympathetic ophthalmia was discussed by **Wilson**. He believes toxins may travel up the optic nerve to the commissure, and then from both tracts to the crura, to the upper quadrigeminal bodies, to the third nuclei, to the sympathetic connector fibers in the third nerves and to the lenticular ganglia. One of the earliest symptoms of sympathetic ophthalmia is weakness or paralysis of accommodation. The only part of the third nerves involved are the lenticular ganglia. He, therefore, advances the idea that perverted action of the lenticular ganglia is an important factor in producing sympathetic ophthalmia.

Gifford reviews the more recent articles relative to the increase of lymphocytes in the blood in cases of sym-

pathetic ophthalmia. He reports the differential count on nine cases of sympathetic ophthalmia, altho only three of these are reported with pathologic diagnosis; six cases of recent perforating wounds of the globe, and eleven cases of prolonged or repeated nontraumatic inflammation of one eye.

Considering the tendency to accept the view of Gradle and of Browning that an increased lymphocytosis is of diagnostic value, the author reports twenty-eight case observations and draws conclusions as follows:

An increase of mononuclears was fairly constant in cases of sympathetic ophthalmia. Average total mononuclears 34.9 per cent. This high count often persisted for a long time, even in perfectly quiet eyes, but in two cases, was found reduced to normal after the

eye had been quiet for two years. It was not constant in fresh perforating wounds which did not develop sympathetic ophthalmia, average 25.9 per cent. It was sometimes found in these cases, however, in isolated counts. A similar increase was just as constant in other chronic affections, such as non-traumatic uveitis, abscess of the cornea, vernal catarrh, etc., as in sympathetic ophthalmia. In both cases, the increase was most marked in the large mononuclears but the lymphocytes were also often increased. Large doses of sodium salicylate were not found to affect the count constantly in animals or men.

It is the opinion of the author, therefore, that the mononucleosis is not specific for sympathetic ophthalmia, but is found as a reaction of the body to a chronic inflammatory process in the eye, of whatever cause. Altho many clinical facts of importance are omitted in the necessarily condensed reports, the author seems justified in stating that increased lymphocytosis should not be considered of any importance in determining the presence or absence of sympathetic ophthalmia or the likelihood of its occurring in any case.

SYMPATHETIC OPHTHALMIA IN WAR.—The most important communication of the year is the compilation by **Morax** of the work done by a majority of the ophthalmic surgeons doing military work in France. In all but one case, sympathetic ophthalmia developed after a penetrating wound of the cornea or anterior part of the sclera, usually penetration by a fragment of bullet, shrapnel or bomb, but in a small number of cases accidental punctures. In many of these, iris or ciliary body prolapse is noted, incarceration fourteen times at least, while an intraocular foreign body was present in ten of the thirty-nine cases.

Sympathetic ophthalmia coming on after intervention may be due to the original injury rather than to the operation, but in one contusion case, the operation for traumatic cataract was followed by sympathetic disease. No pure contusion case had been fol-

lowed by the disease, which would support the usual theory of infection and negative the anaphylactic theory of Elschnig.

Interventions such as conjunctival flaps, resection of iris, etc., or evisceration and enucleation were undertaken with the object of preventing immediate infection or sympathetic disease. The accompanying table shows the number of days after the trauma when the operation was done and the number of days after operation before sympathetic ophthalmia appeared.

The period between the trauma and the appearance of objective signs of sympathetic disease is variable, the shortest being fifteen days and the longest twenty-five years. There were three where the latent period did not exceed from fifteen to twenty days and one case in which it lasted for seven and one-half months.

One must fear sympathetic ophthalmia in the first three months, especially in the second month, but after the third month, it is exceptional. Enucleation within the first two weeks will prevent the development of sympathetic ophthalmia in most cases. He believes that evisceration of the globe ought to be rejected and speaks of the development of sympathetic ophthalmia in a case by Kalt. No signs or symptoms seem to aid in the prognosis of an individual case. Usually the eye remains irritable and tender with photophobia, but not all such are dangerous, for many fail to show the characteristic uveal changes. The end result may be a cure in some weeks or even a year. On the other hand, there may be great destruction of the globe with lessened or increased tension and atrophy. In the series reported, benign cases were predominant, showing the following end results:

Blindness or practical blindness in twelve cases, vision 0.1 in one case, suicide in one case. Vision of 0.5 to 1 in twenty cases, vision of 0.3 to 0.4 in five cases. Fourteen ended badly and the remaining twenty-five ended favorably.

SYMPATHETIC OPHTHALMITIS

Operation.	Interval after trauma.	Time before sympathetic appeared.
Conjunctival flap....	28 days	50 days
Conjunctival flap....	2 months	9 days
Conjunctival flap....	1 month	?
Conjunctival flap....	27 days	2 days
Resection of iris....	1 month	31 days
Resection of iris....	24 hours	32 days
Ablation ant. segment	48 days	3 months
Evisceration	57 days	1 month
Evisceration	4 days	1 month
Enucleation	32 days	12 days
Enucleation	14 days	22 days
Enucleation	15-20 days	1 month
Enucleation	58 days	2 days
Enucleation	33 days	10 days
Enucleation	39 days	16 days
Enucleation	69 days	41 days
Enucleation	46 days	3 days
Enucleation	45 days	17 days
Enucleation	40 days	2 days
Enucleation	3 months	31 days

Probably all observers expected an increase in sympathetic ophthalmia as a result of the many injuries to eyes during the war. **Lapersonne** saw one in military service and two in civil practice as did **Sexe**. **Sourdille**, however, did not see a single case in more than three thousand military wounded, but five in civil practice, three of which resulted in blindness.

At the Lariboisiere Ophthalmic Centre, from September, 1914, to November 23, 1917, there had been seen 6,265 military cases with only one sympathetic, and 23,832 civil cases, with five cases of the disease; one of which ended in blindness, three in full vision and one in 5/10 vision; as a result of mercurial injections and novarsenobenzol intravenously combined with enucleation. All five had the first eye examined microscopically and the characteristic picture confirmed, one case of injury with copper fragment developing sympathetic disease twenty-five months after the injury.

PATHOGENESIS.—**Elschnig** concludes that enucleation and evisceration claim about the same number of cases of sympathetic ophthalmia in the uninjured eye.

In five cases of new patients with sympathetic ophthalmia, the sympathetic affection in one manifested itself three days after evisceration, and in

another 14 days after enucleation of the primarily affected eye. In the first case it seems that the seed of the sympathetic ophthalmia was already in the fellow, altho not visible clinically. In the second case the same condition existed. This patient came to the clinic 17 days after enucleation, and three days after subjective symptoms had set in.

The irritating agency which produces the sympathetic ophthalmia can be present in Tenon's capsule at the time of enucleation, and produce sympathetic inflammation in the fellow eye after the injured eye is removed. If this is true there is as much danger of the well eye manifesting sympathetic disease following enucleation as in evisceration.

Where sympathetic ophthalmia sets in early the author believes that the inflammation was present in the fellow eye at the time of enucleation or evisceration, but if it sets in some time after the operation, he concludes that since these manifestations are known to be uncharacteristic, the cause is due to the anaphylaxis of the body, and that the enucleated eye, if present, would be equally affected with its fellow eye.

He states that it is not to be supposed that the antigen resorption of the uveal tissues in the exciting eye, produces immunization, so that after enucleation the fellow eye is endangered. The antibodies produced by uveal tissue are not absolutely, but only relatively specific. This has been proven experimentally. In spite of the presence of the antibodies, the uveal tissues become highly sensitized to homologous proteins. According to this there is no active or passive immunization, but an autoimmunization. The absorption of degenerated tissue products from the injured eye stimulates the production of the relatively specific antibodies.

The author claims that the surgeons who are more radical and remove the injured eye early, as a preventive measure will not meet with a sympathetic ophthalmia in the uninjured eye; after the operation, as frequently as

those who wait until later. If the injured eye is removed late one cannot be sure that the manifestations of sympathetic disease will not appear some time after the operation.

Poulard claims enucleation did not prevent sympathetic ophthalmia developing four months later but his case is so unusual and the diagnosis so uncertain that a brief review is worth while.

The man was wounded on the right eye by a piece of shell, April 30, 1915. May 11th, it was painful, soft, with hyphema, and, by radiography, an intraocular foreign body was located. June 9, enucleation was done. At the end of September the sight of the left eye, which had kept perfect, began to fail, and he consulted Poulard. On October 1, vision was one-fourth; much floating vitreous opacity, slight signs of iritis present and the fundus showed peripheral choroiditis with small brownish spots. On October 12th, more vitreous opacity, iris markedly affected, with pupillary exudates and synechiae two small spots of corneal infiltration, tension normal, vision equal one-fifth. There was steady progress of iris infiltration with pupillary exudate, the vision lost, the eyeball became small and atrophic. There was no report of the general examination details or pathologic eye findings. The eye was quiet for four months and then in the next two months, the sight was destroyed.

In another paper **Poulard** reports the penetrating wounds of the eye at the Twenty-fifth Ophthalmic Center, from September 1, 1914, to September 15, 1917.

Total number penetrating wounds	858
Prophylactic enucleation	414
Balance	444
Of the latter	
Destruction of eye by injury	76
Intraocular foreign body	24
Quiet atrophic globe	65
Globe preserved with slight vision	98
With good vision	67
Iridocyclitis treated by ablation of anterior segment and currettement	119

There was only one case of sympathetic ophthalmia, which occurred in a

patient four months after enucleation of the injured eye, altho 414 eyes were enucleated to prevent later trouble. He in another paper advises against enucleation as being too often unnecessary and always disfiguring. He proposes partial ablation as a substitute which fortunately few seem inclined to accept. Because the disease is comparatively rare does not mean that it would continue to be if our well recognized methods of prevention and treatment were to be discontinued. His deduction that the removal of the injured eye is too radical an operation should not be passed without condemnation, for it is conducive to delay and danger.

CASES.—**Wessely** reported the following three cases: A young soldier was wounded in the right eye by a grenade splinter and the eye enucleated. The left eye, which was healthy at that time, developed sympathetic ophthalmia in fourteen days. It was first treated by inunction but later, when a severe iridocyclitis with increased intraocular tension appeared, an iridectomy was performed and inunctions of electrargol tried. Final vision equal fingers close to the eye. Two months after having the left eye injured by a piece of stone, a seven year old boy was seen with sympathetic ophthalmia in the right eye. Although the left eye was enucleated, he later had a plastic iritis with pupillary occlusion and increased tension. The end result, after an iridectomy and inunctions, was vision of 1/20. A woman of forty-eight was injured by a cow's horn striking the right eye. Two days later, the eye was exenterated. The right stump showed the characteristic findings of sympathetic ophthalmia. Inunction treatment gave vision 0.9. Wessely's conclusion that enucleation within two weeks will not always stop sympathetic ophthalmia is in agreement with Morax's conclusion, but his position that perhaps enucleation caused the sympathetic ophthalmia is untenable.

Chaillous had a soldier who was injured in the right eye by a piece of shell, the wound was located in the ciliary region. The eye was removed six days later. A foreign body was

found in the eye. A dressing of Vincent's powder was placed in Tenon's cavity, and healing proceeded without incident. Nine days later, visual trouble began in the other eye, with lacrimation, photophobia, and pericorneal injection. Two days later fine deposits were seen on Descemet's membrane and the media became cloudy. Diagnosis, cyclitis of sympathetic type. Treatment, intravenous injection 25 cg. novarsenol, which resulted in a cure in about three weeks.

Rousseau's patient was struck in the center of the right cornea by a thorn and the wound was cauterized eight days later. Subsequently treatment, including mercury rubs was instituted. No vision was present in the right, and there was periodic pain in the eye. About five months later cloudiness in the left eye developed. At first it was transitory, then permanent. Photophobia and pain were present. The right eye was enucleated. Mercury rubs were started and atropin was used in the left eye, but symptoms increased and vision became 1/100. Several injections intravenously of cyanid of mercury resulted in disappearance of symptoms and vision rose to nearly 1/20.

Three cases of sympathetic ophthalmia seen in one clinic in a year were demonstrated by **Brown**. The specimens showed the result of a trephining, a rupture of the margin of the cornea after a spontaneous thinning and ectasia, and a penetrating injury.

Faith saw a patient after his eye had been struck with a piece of ice. There was no open wound, simply a contusion of the eyelid with subconjunctival ecchymosis. The pupil did not dilate under cocain and homatropin, vision was reduced to light perception, and tension was 48. No relief followed local treatment or an iridectomy. The history, of having had a foreign body in the same eye for two and one-half years, was then secured, and the X-ray located the offender in the anterior segment. A few days after the enucleation, the remaining eye became injected with Descemet's deposits, cloudy vitreous and vision of 20/40 with a marked lymphocytosis. Salicyl-

ates and mercury were given. His very bad teeth were scaled with marked improvement. As the vision is now 20/20 and as no pathologic report accompanies the history, we must hesitate in calling this sympathetic ophthalmia when it doubtless was a toxic uveitis.

Pissarello reports a case of sympathetic ophthalmia in which deafness developed. He believes that the deafness was due to the same condition which produced the sympathetic ophthalmia.

The patient, age 37, received a blow on the right eye with a nail and treated himself by simply washing the eye. Three months after the accident his vision started to fail in the left eye, with severe headaches and deafness. The deafness cleared up after three days, following the removal of the impacted cerumen from the canals. Operation was done on both eyes and the patient was treated for twenty-five days, after which time he improved and received no further treatment. No other history could be obtained from the patient or his relatives.

Six months after his injury he was seen by Prof. Gaudenzi and the author. Three iridectomies had been done, two in the right and one in the left eye. He was in poor general health, and in a state of mental depression and stupor. The lids of the right eye were swollen and cyanotic, there was intense lacrimation and photophobia, the conjunctiva injected and chemotic and the pericorneal vessels were engorged. The cornea was dull and infiltrated. At the superior portion of the limbus an ectatic scar, in which granulation tissue could be seen, was the result of former operations. The anterior chamber was almost abolished, the iris was covered with an exudate which obliterated its details, and the coloboma was pulled upward toward the scar. No fundus reflex could be seen with the ophthalmoscope. The globe was tender to touch, but the tension was normal. There was slight light perception, but no projection.

The left eyelids were swollen, there was intense lacrimation and photophobia, pericorneal and conjunctival injec-

tion and chemosis. The corneal epithelium was irregular and in the upper position exfoliation had taken place in several areas. The scar above showed a bulb about the size of a hemp seed, which protruded thru the lips of the iridectomy wound. The anterior chamber was almost abolished and the iris was covered with a richly vascularized exudate. The exudate covered the coloboma. No red fundus reflex could be obtained. Perception and projection of light were good.

The right eye was enucleated the following day, and mercurial inunctions and injections were started. Locally in the left eye atropin was used and cacodylat of guaiacol 1 per cent was injected subconjunctivally twice. The Wassermann test at this time was positive, and Mantoux tuberculin test negative.

The patient's general condition improved and the cornea became clearer, and some of the exudate in the anterior chamber was absorbed. The vision increased until the patient could distinguish hand movements at 30 cm.

One evening, a month after the right eye had been enucleated, the patient had a violent pain in the head, and on the following morning was absolutely deaf. The left eye again became violently inflamed, the vision diminished to light perception. The headaches disappeared in three days, but the patient remained deaf. No changes were noted in the ears after frequent examinations and the deafness was due to a low-grade meningitis. The patient was kept under observation for another month, but there was no improvement in the eye or ear condition.

The author also reports the histologic findings from the sections of the enucleated eye.

Lebensohn in discussion reported the case of a boy, hurt four and one-half weeks before; the nature of the injury was not known, but there was a small scar in the lower border of the cornea. The injured eye was blind and the other had a fully developed sympathetic ophthalmia. Half a pearl button was found in the vitreous when the blind eye was enucleated the next day.

The disease progressed so that the boy was totally blind in three or four months. **Goldenburg** at the same time, reported the case of a piece of cartridge shell in the eye of a child. The eye was enucleated within forty-eight hours of the accident and yet sixteen or eighteen days later, sympathetic ophthalmia developed in the other eye. For six or seven years, she has had from 12 to 18 attacks of inflammation, at times with vision almost gone, and on four occasions, optic neuritis. Although X-ray and all laboratory methods failed to show any other etiologic factor, the author questions his own diagnosis, which, lacking pathologic confirmation, must remain undecided.

Schevensteen cited the history of a patient, in war August 19, 1917, who was discharged October 18, 1917, with a complete traumatic cataract. Vision of the other eye was normal. On November 21st the cataract was extracted, the patient, however, squeezed his lids, causing a hernia of the iris, which was excised. The anterior chamber filled with blood which showed little tendency to absorb, but on December 15th the eye was normal. January 9th the other eye became painful and in two days was injected with photophobia, Descemet's deposits, tension slightly minus and vision 0.4. On January 14th, the symptoms persisting, the eye was enucleated. January 31st some papillitis, novarsenobenzol was given twice. Improvement was gradual until April 1, 1918, when cured. Microscopic examination of the enucleated eye showed incarceration of the iris in the corneal wound, with infection and the uveal changes characteristic of sympathetic ophthalmia.

Because an eye had been blind for a long time with a shrunken, hard globe, which later became painful, is no reason why **Mansilla** should consider an incipient neuritis in the other eye as sympathetic ophthalmia. After enucleation, the vision of the remaining eye became normal. He believes the dislocated lens found in the enucleated globe the cause of the other eye irritation; the choroid, however, was seemingly negative.