estimate that four drams of fluid was included in each eye.

The treatment was incisions, made, I must confess, too cautiously the first time, for my attention had never been called to a chemosis of any such extent, and I did not know what pathologic condition might be concealed beneath. The oozing of serum was slow, but sufficient to enable the cornea of one eye to be seen at my next visit. The incisions were repeated with the effect of enabling me at my third visit to examine the fundus, which I found almost filled with white patches of choroidal change, which we might call edema of the choroid.

Now a peculiar complication occurred. The cornea was no longer completely covered by the folds, and still the edematous and thickened conjunctiva prevented the lids from closing, which compelled me to give directions in regard to the cornea, to prevent damage from exposure.

I saw him no more, but learned that he had uremic convulsions, after which sight and general symptoms improved, and he returned to Michigan. Here the conjunctivæ were treated by cautery, but the patient died about three months after I last saw him.

I am not able to give any reason why the ocular conjunctiva should have become so infiltrated in this case. No iodid of potassium had been administered, or any other treatment that could induce it. There was no history of a previous affection of the eye. No discharge or symptom of gonorrhea.

This condition seems to be analogous to that of edema of the glottis. This, as we know, often arises suddenly and alarmingly, and at times without an apparent adequate cause. Max Knies¹ speaks of edema of the ocular conjunctiva, but says that it appears to be very rare.

Brecht² describes one case of chemosis in Bright's disease. The patient was six months pregnant when she had an attack of eclampsia, with other symptoms of acute Bright's disease. He saw her five days later, when she had detachment of the retina and chemosis. After fourteen days this had disappeared. His only explanation of the detachment and the chemosis was that they were both due to some especial tendency for the edema to manifest itself in the eye.

Professor Schiess, writing in 1870, thinks the subject of conjunctival edema has been neglected. He would ascribe all such cases as my own to preceding choroidal changes interfering with return circulation. I noticed that the retina could be seen with a plus glass in my case, but neglected to record the strength of it. According to Professor Schiess' view the pathology of my case would be that excessive infiltration of the retina and choroid first occurred, which caused passive congestion of the anterior portion of the eye, with exudation of serum and leucocytes. That there was a sub-acute inflammatory condition he would predicate from the dark red color of the mucous membrane and the thickening of the tissues. With this condition of the conjunctiva present, he would assume the presence of choroidal disease.

Since my patient had no mental symptoms there is less analogy to those cases in which chemosis has been noticed as a result of interference of the return circulation from the eye within the cranial cavity. Lawson Tait gives three cases in which after surgical operations chemosis occurred. Death ensued and section showed thrombosis of the cerebral tissues.

Dr. Hunter³ reports a case of chemosis complicating acute meningitis and refers to cases by Leyden and Bierbaum. Here the same cause is evident, that is, intra-cranial pressure interfering with return circulation.

Dr. Swan M. Burnett⁴ records a case of acute chemosis which he thinks was due to neuralgia complicated with slight changes in the choroid, sufficient to hinder return circulation in some degree.

Zehender⁵ refers to an acute case of marked edema of the ocular conjunctiva rapidly recovering. He is doubtful in regard to the causation. The patient had had sub-acute pneumonia a short time before and the attack came on with sneezing.

DISCUSSION.

G. E. DE SCHWEINITZ, Philadelphia, Pa.—There are cases of acute edema of the conjunctiva which may be due to urticaria, or to an idiosyncrasy to certain food stuffs, especially fruit. I also believe that some cases are occasionally the result of the administration of drugs, particularly massive doses of iodid of potassium, the ocular manifestations replacing the ordinary symptoms of iodism.

EXCESSIVE HEMORRHAGE AFTER ENUCLEATION OF EYE BALL.

Read in the Section on Ophthalmology at the Forty-seventh Annual Meeting of the American Medical Association held at Atlanta, Ga., May 5-8, 1896.

BY ROBERT SATTLER, M.D.

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The danger of excessive hemorrhage after enucleatio bulbi is ordinarily a matter of little concern. In most cases the application of a compress bandage or a compress applied and held in position by the surgeon or an assistant for a few moments after the operation is completed controls and averts unnecessary bleeding. That hemorrhage, so excessive and uncontrollable as to endanger the life of the patient from shock and loss of blood, can occur even after this operation so simple in technique and by common consent considered almost devoid of dangerous sequences, is supported by the accompanying reports of two cases recently observed.

In every case of enucleation of the eyeball, in addition to rigid aseptic precautions before and during the operation, irrigation of the empty orbital cavity with hot sterilized water, 1 to 10,000 bichlorid solution or biniodid solution, with the least possible traumatism, is resorted to immediately after the operation is completed. After this a compress is held against the closed lids for a short time by an assistant or a compress bandage is applied.

This is done as a safeguard against hemorrhage and possible sepsis. In those cases in which the bleeding is unusually profuse after the severing of the optic nerve and surrounding blood vessels or straining and vomiting from the anesthetic occurs during or immediately after the operation, the index finger is introduced into the apex of the orbit and firm compression against the ophthalmic artery, or its principal branches, is made until it is arrested. After this a compress bandage is applied and the patient watched for several hours by an assistant or trained nurse.

This simple after treatment, guarding against other complications and hemorrhage, and so generally adopted by ophthalmic surgeons, had always been

¹ The Eye in Its Relation to General Diseases.

² Arch. für Oph. xviii, 2, pp. 102.

³ Arch. f. Klin. Med. iii, p. 601.

⁴ Archives of Ophthalmology, Vol. ix, p. 158.

⁵ Klin. Monatsblätter f. Augenheilkunde, viii, p. 168.

found effectual in my surgical practice. I have had several exceptional experiences of copious hemorrhage but all were controlled, after four or five hours, with little difficulty. In two cases bleeding continued for twenty-four hours and was finally arrested only by the introduction of hot antiseptic tampons into the cavity, secured by compress and bandage after all other measures had been exhausted. A sharp attack of cellulitis orbitæ followed, but recovery was, after its subsidence, uneventful. In another case the hemorrhage was unusually free and persisted for many hours, regardless of compression with bandage and hand. The use of hot compresses did not influence it favorably. After all other means had failed ice was introduced into the orbital cavity and arrested the bleeding. Owing to the discomfort and pain, not to mention greater liability to cellulitis, attending the introduction of ice, tampons, styptics, etc., to arrest exceptionally profuse hemorrhage, these measures are only justifiable in extreme cases. It was resorted to in the cases referred to only after all other methods had been faithfully tried and had yielded negative results and the patient had become exhausted and frightened.

Before tamponade was resorted to, digital compression had been tried repeatedly and the orbital cavity emptied of its clots many times and pressure with hand or bandage had been persistently done. The sitting posture and absolute quiet was invariably enforced. Salines and ergot administered. In these cases the hemorrhage was not arrested until tampons were introduced and compression made in addition, but there was not in a single instance any intimation of a possible serious termination. Syncope occurred several times from fright in one case, and marked prostration and cellulitis orbitæ resulted in the second case, but aside from a longer confinement in bed than is usual, never persistent ecchymosis and swelling of lids, no serious sequences could be ascribed to the operation. In none of the cases could a hemorrhagic tendency be established, either individual or hereditary, nor did the patients belong to families in which hemophilia had shown itself in remote branches. I have always believed that even in a bleeder, the hemorrhage following or attending the removal of an eye, could, with the methods of direct and indirect compression at our command, be controlled without much trouble. My experience with one of the cases I am about to describe, however, has taught me otherwise.

Case 1.—R. C., age 16. Traumatic iridocyclitis R. E., T. 2. Globe painful, sympathetic irritation unmistakable and persistent. Enucleation imperative. Enucleation February 9 of right eye, at Ophthalmic Hospital. Ether narcosis. Free but not excessive bleeding during operation. Patient remained in recumbent position for three hours and was removed to his home in a carriage. Had persistent nausea after operation but vomited only once. At 7 p.m. was called to see him and found that profuse bleeding had occurred. Bandage, pillow and linen thoroughly saturated and consistent flow of blood in spite of compression, to which father had resorted. Dressings and bandage removed and orbit emptied of clots and firm compress applied and held for ten or fifteen minutes; after this a bandage and compression with the hand and large pad of gauze was kept up until 9 o'clock. At this hour it was found that hemorrhage, in spite of bandage and pressure, had continued. A hypodermic of morphia was given and for two hours he was quiet and slept at intervals. At 11 o'clock I was sent for and found the patient much prostrated, with feeble and rapid pulse. The bandage was thoroughly saturated with blood and numerous compresses had been applied over the bandage, evidenced that the bleeding had been profuse. The dressings were removed and attempt made to tampon the cavity, but the infiltration was so firm that it was not successful. Several small pledgets of aseptic gauze were introduced and compress

and bandage applied and pressure made from without. He was placed in a sitting position and compression of common carotid resorted to and another hypodermic of morphia administered. The following morning I was again sent for at an early hour and found that patient had been bleeding all night and that he had been restless. During the last hour his condition alarmed his parents. He was delirious and the prostration excessive. After a hypodermic of strychnia and whisky and hot applications to the extremities, I removed the dressings and found that complete extrusion of the contents of the orbit had resulted. The picture presented was a startling one. Complete evulsion of the conjunctival sac with complete involution or rolling under of the eyelids so that it was impossible to distinguish the lid border. The swelling was so great that it resembled an exuberant, eroded, sarcomatous mass and the hemorrhage unchecked. A small tampon saturated with persulphate of iron was introduced into the gaping opening of the conjunctiva and a compress, dipped in a styptic solution, applied and held with firm pressure against the extruded mass. Compression of carotid was also resorted to but caused so much pain that it had to be abandoned. Salines were given freely and also ergot. At noon general condition was about the same. Patient as if in a stupor and very listless. Complaints of photophobia of sound eye and pain in occipital region. Has taken little nourishment on account of persistent nausea. Only external compress was removed and constant pressure kept up by different members of the family. Stimulants and ergot continued. At 5 p.m. dressing removed. Hemorrhage during afternoon was unabated: patient dull and listless; face pale; feeble, rapid pulse; shrieking with pain, which was referred to head and right orbit. Full hypodermic enabled us, after a little time, to remove the dressings. It was found that greater protrusion and infiltration had resulted. Nothing could be discovered of the eyelids. The swelling was too great for the grasp of the outstretched hand but the oozing was as persistent as before. Styptic compresses were immediately applied and pressure against the bleeding, protruding mass kept up without interruption. Ligation of the common carotid was suggested, but after consultation was postponed until the following morning, as pressure seemed to control, more effectually, the bleeding. Ergot, stimulants and morphia continued.

Second day: In spite of constantly applied compression the bleeding was profuse during the night; prostration great; pulse feeble and rapid; pain in right side of head; no increase of temperature. During day condition about the same; drowsy and listless and delirious most of the time. In afternoon had chill followed by fever and pains in head more severe. Complaints now of throbbing, pulsating pain in right orbit. Examination shows that bleeding continues and that swelling is greater. Cellulitis imminent. Compression applied constantly.

Third and fourth days after operation: General condition bad; circulation feeble and fever fluctuating between 100 and 103 degrees; can take little nourishment; impossible to apply bandage owing to pain; compression kept up unintermittingly.

Fifth to eighth day: Cellulitis orbitæ pronounced; at several points present evidence of fluctuation; exploration with aspirator needle fails to discover pus; fever and general prostration marked; less suffering and photophobia of fellow eye. Under an anesthetic the orbit was carefully explored, in the hope that a deep-seated collection of pus might be found, but examination was negative; hemorrhage much less and can now be controlled by compression.

Ninth day: Is much brighter and delirium has disappeared; very drowsy and complains of great pain in head; ergot discontinued.

Tenth to fifteenth day: Swelling remains marked, but no evidence of suppuration; central mass of swelling sloughing; rigid antiseptic dressing.

Fifteenth to twenty-first day: Swelling subsiding; border of lower lid visible and entire border sloughing; irrigation with warm 1 to 10,000 bichlorid and iodoform powder resorted to; general health improving; vertigo less pronounced.

Twenty-first to twenty-eighth day: Gradual improvement in general condition; subsidence of swelling. Two-thirds of border of lower lid and inner one-third of upper lid have undergone sphacelation; succeeded in replacing conjunctiva and lids for first time in four weeks; again close palpebral fissure.

The patient was a bleeder and belongs to a family other members of which had manifested a similar tendency. Only five or six months before the operation the extraction of a tooth caused him to bleed to syncope and was only arrested by firm tamponade.

Case 2.—J. C., aged 50; confirmed glaucoma, cataracta complicata, intraocular neoplasm(?); V.=0; pain excessive and constant. Operation imperative to prevent possible sarcomatous infection and to relieve pain. Is a feeble old man with evidences of general arterio-sclerosis and senile heart.

Enucleation August 26, 2 P.M.; anesthetic (ether) given with great caution; no complications and no unusual bleeding, either during or immediately after the operation. At 4 P.M. nurse noticed slight discoloration of bandage and applied another bandage and compress over the first; no complaint, no vomiting. At 7 P.M.: Nurse after attending to wants of another patient found bandage and pillow saturated with blood; pressure with hand was applied and shortly afterward bandage removed and orbit emptied of clots and firm compression with fingers in apex and subsequent iced compresses applied with hand: patient very weak; pulse feeble; under active stimulations, hot water bottles, etc., he revived and oozing continued in spite of pressure.

9 P.M.: Immediately following an attack of syncope, in spite of compression with bandage and hand, profuse bleeding again came on. Hypodermics of whisky and strychnia given: patient very weak; orbit was thoroughly cleaned out and all clots removed; firm compress bandage reapplied over both eyes and nurse instructed to keep up constant pressure over bandage.

On the following morning patient was much exhausted; pale and yawning constantly; complains of severe pain. Hemorrhage had continued during night in spite of compresses; on removing bandage the entire orbit was found infiltrated with blood, the palpebral fissure widely open and contents of orbit partially extended; the lids were swollen and edematous; attempts to arrest hemorrhage by application of artery forceps, etc., proved ineffectual. The clots were again removed, compression of carotid was also made and the orbit tamponed with styptic gauze and compress applied; active supporting measures were resorted to; saline draughts were given and ergot freely administered.

At 3 P.M.: Patient much weaker, face pallid, extremities cold; bleeding constantly in spite of bandage and pressure with hand; compression of carotid could not be tolerated, as it increased vertigo and tendency to fainting.

At 8 P.M.: Very restless and delirious. Examination showed that tampon had been forced out and infiltration of orbit much greater. It was impossible to tampon, so compress of styptic gauze was applied directly and pressure kept up with relays of nurses during the night.

The following morning, third day after operation, bleeding less but patient excessively feeble. The most active supportive measures were resorted to, hypodermically and per rectum; nausea intense.

Fourth day: Bandage not disturbed; only slight oozing; patient has no increase of temperature; drowsy and dull.

Fifth day: Aside from great prostration no complaint; from this time on his recovery was uneventful.

This patient was not a bleeder. The excessive hemorrhage was probably due to general arterio-sclerosis.

THE VALUE OF HOMATROPIN IN THE DIAGNOSIS OF AMETROPIA.

Read in the Section on Ophthalmology, at the Forty-seventh Annual Meeting of the American Medical Association, at Atlanta, Ga., May 5-8, 1896.

BY EDWARD JACKSON, A.M., M.D.

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Its control over the ciliary muscle.—In 1881, soon after its introduction, I commenced the use of homatropin hydrobromate as a cycloplegic for the determination of refraction. At first it was used occasionally, then more frequently, and after a year or two for the majority of cases of ametropia encountered in private practice.

It was known to be less powerful than the other drugs employed for the same purpose. On that account its results were always regarded with some doubt, and where there seemed to be any especial uncertainty as to the findings made with it, it was followed by the instillation of one of the stronger mydriatics. In 1886 I published (*Medical News*,

July 24) the results obtained in these cases where the use of homatropin had been followed by one of the stronger mydriatics.

"In but fifteen out of the fifty-two eyes was there any difference between the first and second results. In eight of these it was one-quarter dioptic in favor of the second mydriatic, in five it was one-quarter dioptic in favor of homatropin, in one it was (in one meridian) one-half dioptic in favor of homatropin and in another the same in favor of duboisin. In no case was the variation greater than may well be allowed for unavoidable inaccuracy of observation. In no case was the apparent axis of the astigmatism materially changed."

Since that time the practice of following the use of homatropin by one of the slower mydriatics, in cases where the results with homatropin have seemed not entirely satisfactory, has been continued and the results obtained have not been materially different.

During these fifteen years I have also been employing other mydriatics; for refraction cases in private practice to a limited extent, and for the large majority of refraction cases in dispensary work. Those habitually employed were atropin, duboisin and hyoscyamin, while daturin and scopolamin have been carefully tested in a limited number of cases. Comparison of homatropin cases with those subjected to other mydriatics has shown that the proportion of cases in which I failed to secure complete paralysis of accommodation with homatropin was smaller than with either of the others.

Mode of application.—When the above observation is compared with the relative strength of the drugs, as determined by physiologic experiments (*Transactions of the Section on Ophthalmology for 1895*, page 8), there appears the paradox that the weaker drug is the more efficient cycloplegic. The explanation of this is, I think, furnished in the different methods of using the drugs. Schell early pointed out (*Philadelphia Medical Times*, October, 1880) that homatropin could not be used in the same way as the other mydriatics, and I have from almost the first, followed the plan of repeated instillations at short intervals. A solution of from 2 to 5 per cent. was used, one drop being placed on the upper margin of the cornea every five to ten minutes until four or six instillations had been made. The determination of the refraction was completed within two hours of the instillations. On the other hand, the other mydriatics have usually been prescribed to be instilled three times daily at the patient's home, atropin in about 1 per cent. solution and the others in solutions of one half that strength. Used in this way the difference in the strength of solutions, and in the efficiency of their applications have together more than counterbalanced the difference in the physiologic action of the drugs.

It is hard to estimate how much a mydriatic solution loses in efficiency by imperfect instillation at the hands of the patient's family, but I have often seen cases in which the effect produced was less than one-hundredth of the effect properly to be expected. In my experience, therefore, homatropin applied by the surgeon is a more reliable cycloplegic than other drugs of this class as applied at the patient's home.

Notice that it is not asserted that homatropin is as reliable as other mydriatics when placed in the hands of the patient for application, and it is not asserted that homatropin is reliable unless efficiently used. There is abundant testimony in medical literature to