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WITH SOME PRACTICAL SUGGESTIONS
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OF THIS OPERATION,

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COMPARATIVE STATISTICS OF TWO HUNDRED CASES.

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BY

HASKET DERBY, M. D.

SURGEON TO THE MASSACHUSETTS CHARITABLE EYE AND EAR INFIRMARY;
TO THE CARNEY HOSPITAL, ETC.

CAMBRIDGE:
Printed at the Riverside Press.
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WHAT follows is based upon and partly made up from two much shorter articles on the same subjects, one of which appeared in the "Boston Medical and Surgical Journal," vol. xcvii., No. 18; the other in the "Transactions of the American Ophthalmological Society," vol. iii., Part 2.

ANÆSTHESIA AND NON-ANÆSTHESIA

IN THE

EXTRACTION OF CATARACT.

The operation for the extraction of senile cataract bids fair always to remain the capital operation of ophthalmic surgery. With the possible single exception of iridectomy for glaucoma, more interest centres in it, and more consequence is attached to its result, than in the case of any other form of instrumental interference with the eye; while its comparative frequency of occurrence renders its careful study of the first consequence.

Very few ophthalmic surgeons, I imagine, have followed blindly in the beaten track. From time to time improvements have been suggested, and modifications of accepted methods brought forward. They have held fast to the good and dismissed, after a passing trial, that which has failed to stand the test of time, or bear the brunt of statistics. Much interest would attach to the recorded experience of a candid operator, if, after fifteen or twenty years of active practice, he should publish a truthful history of his successive changes of opinion, and give his reasons for the course he at present pur-

sues, a course, it may be, widely diverging from the one on which he originally entered.

Three important questions, with reference to the operation of extraction, have always possessed a special interest for the present writer, and he now holds on all of them views differing widely from those he originally entertained. Believing, as he does, that the results of his practice have been favorably influenced by the course he at present pursues, he desires briefly to draw attention to the points at issue. They relate to —

(1.) The use of anæsthesia.

(2.) The employment of mydriatics, before the operation.

(3.) The proper period for the first examination of the eye after the operation.

Up to the publication of Jacobson's pamphlet, "A New and Safe Operation for Cataract," in 1863, the extraction of cataract was, on the continent of Europe, almost universally performed without anæsthesia. In Vienna and Berlin, as well as in Paris and Utrecht, I cannot remember a single case where chloroform was used, in my student days, between 1859 and 1862. The general feeling on this subject was fully expressed by Arlt, in his statement that he had never been able to encourage the use of either sulphuric ether, chloroform, or a mixture of both, on account of the possible occurrence of vomiting, or convulsive muscular movements, as a consequence.[1] Doubtless, too, one

[1] Krankheiten des Auges, vol. ii. p. 306.

reason for the general avoidance of anæsthesia was expressed by Zehender, when, speaking of the use of chloroform, he says, "The cases of death from the use of this agent, relatively infrequent as they are, most decidedly prevent us from regarding its employment with indifference or characterizing it as safe."[1] The use of ether had, at that time, obtained no foothold in Germany, where its great advantages were either unknown or disregarded.

Jacobson[2] was, after Jüngken, the first of his countrymen to advise the invariable administration of chloroform in extraction, using an operation, it is true, modified by himself. Admitting but a single disadvantage from the use of an anæsthetic, that of persistent retching and vomiting after the operation, he claims, on the other hand, that chloroform renders fixation of the bulb both painless and possible; that it paralyzes the muscles, and hence diminishes the chance of an expulsion of vitreous; that it facilitates the performance of the operation on nervous patients, on people in their second childhood, and on those addicted to the use of stimulants; and, finally, that it secures perfect immobility of the eyelids and of the eyes. More complete rest during the few hours succeeding the operation is also mentioned among the advantages.

Three years later Pagenstecher[3] brought before the Heidelberg Congress an operation for extract-

[1] Seitz und Zehender, Handbuch der gesammten Augenheilkunde, p. 466.

[2] Ein neues und gefahrloses Operations-Verfahren zur Heilung des grauen Staares. Berlin. 1863.

[3] Kl. Monatsblätter, vol. iii. p. 316.

ing the lens in its capsule, and advised the constant use of anæsthesia. It was at this same Congress that von Graefe announced his new method of modified linear extraction. In an extended article[1] on this operation, published that year, he alludes to anæsthesia, in this connection, and claims that, in this form of extraction, the objections to it are somewhat lessened, although he by no means advises its general employment. A year later, however, he recedes from this position.[2] The loss of vitreous had now become so infrequent as to require no special measures for its prevention. And he had found, on the other hand, that with the inability of the patient voluntarily to direct the eye downwards, there existed an appreciable obstacle to the removal of fragments of cortical substance, after the nucleus had come away. Hence he says, "In the present state of things I am even less disposed than formerly to advise the general use (of anæsthesia), and favor its conditional employment only in the decided minority of cases."

"Anæsthesia is permissible," says Arlt,[3] in 1874, "but only necessary in the case of very nervous patients, or for those who lose their self-control when the speculum is applied."

While, as will be seen from the above, the highest European authorities have steadily inclined to the disuse of anæsthetics in the operation of extraction, their example has by no means been fol-

[1] Archiv für Ophthalmologie, 11, III., 46.
[2] Archiv für Ophthalmologie, 12, I., 158.
[3] Graefe-Saemisch, Handbuch, vol. iii. p. 293.

lowed in this country, as is indeed most natural. Our people have long been familiar with the fact that anæsthesia in surgery is an American discovery, and that sulphuric ether may be used for this purpose with entire impunity, if sufficient care be bestowed on its administration. Freed from the anxiety which, however slight, must yet to some extent beset both surgeon and patient in countries where chloroform is generally employed, and taking perhaps a certain pride in the utilization of a home invention, the American patient has been in the habit of demanding artificial insensibility to pain to an extent unusual in other countries, and, indeed, unjustifiable with other anæsthetics. Whatever be his theoretical notions on the subject of hygiene, the average individual in this country thinks so little of his own body, is so careless of its surroundings and so impatient of its wants, so apt to regard it an incumbrance and to begrudge the time requisite to its proper care, that he is prone to resent bodily pain as a mutiny, and insist on stifling its manifestations in the most forcible manner.

With us in Boston, at any rate, for nearly twenty years past ether has been habitually used at all operations for the extraction of cataract. At the meeting of the American Ophthalmological Society in 1867, there was a general expression of opinion in favor of this practice. In 1868 Dr. E. Williams, of Cincinnati, stated,[1] at the meeting of the same

[1] Transactions of American Ophthalmological Society, 1868, p. 124.

Society, that he had changed his mind on the subject of anæsthetics in extraction, and now never gave them except in the case of persons who have little or no self-control, or who refuse to make the trial. No similar public avowal was, however, to my knowledge, made among us for the next ten years, and at the present moment it is probable that anæsthesia is at least as much the rule as the exception throughout this country. Certainly, save in a short article[1] by myself, its disadvantages have not been seriously discussed. My own experience has thoroughly convinced me *that the state of anæsthesia throws appreciable obstacles in the way of a successful extraction, and that its regular employment tends to diminish the number of favorable results that would otherwise be obtained.* I have consequently discarded its use, save in exceptional cases.

The above conclusion is based on the following facts: —

(*a.*) If an anæsthetic is to be used, the patient must fast for some time before the operation, and is physically unable to retain nourishment for an appreciable time afterwards. The injurious effect thus produced on the aged and feeble is sufficiently obvious.

(*b.*) The amount of congestion induced in many by the inhalation of ether encourages hæmorrhage, and the anterior chamber often fills with blood before the division of the capsule, when it would otherwise have remained free. This hæmorrhage, moreover, as was stated by Dr. Noyes, of New York,

[1] Boston Medical and Surgical Journal, Nov. 1, 1877.

is harder to get rid of, on account of the absence of the *vis a tergo*.[1]

(*c*.) The patient being conscious, fixation forceps may be removed after the counter-puncture, and not again employed during the operation, the proper voluntary direction being given to the eye. But the patient's will being, under ether, in abeyance, he is no longer able to render that assistance to the surgeon which is of so much importance. Every needed motion must be given the eye-ball by traction with the fixation forceps; whose use becomes all the more indispensable when the eye, as is often the case under ether, rolls upwards. Under these circumstances, the pressure caused by fixation and dragging downwards, during the iridectomy, not infrequently leads to a loss of vitreous.

I do not think that sufficient stress has ever been laid on the injurious effect on the eye of prolonged fixation. Each grasp of so delicate and sensitive a member with this rude instrument (toothed or serrated forceps) causes ciliary injection and acts as a local bruise, the multiplication of which may well tend to retard or complicate the healing process. Becker's remarks, in this connection, are most instructive. He says: "Seizure of the conjunctiva bulbi, either alone or with the addition of the tendon of the rectus inferior, is ordinarily looked upon with indifference. And yet an appreciable injury is only too often thus inflicted.

[1] Transactions of American Ophthalmological Society, vol. iii. p. 207.

Though the fixation forceps be used in the most careful manner, the point they seize becomes for days the seat of a defined redness. If the teeth of the forceps are very sharp, the patient restless, and the conjunctiva fragile, as is often the case with the aged, bleeding follows and the tissue may even tear." Speaking later of the wrenching given the cornea, ciliary body, and iris, by drawing down the eye after the cut has been completed, he observes: "The more or less perfect manner in which these secondary injuries are avoided goes very far to determine the varying success met with by operators of otherwise equal skill." [1]

(*d.*) In profound anæsthesia the muscles are relaxed, the eye loses its tension, and the difficulty of removing cortical fragments is considerably increased.

(*e.*) The patient, who has been rendered insensible, can give no information as to the clearness of his vision. Not only does he lose the moral support of once exercising his newly acquired sight, a support that has cheered many a one through the long dark days of convalescence, but the surgeon is unable to satisfy himself, by roughly testing vision, as to whether he has performed his task thoroughly.

(*f.*) Finally the nausea that, in spite of every precaution, will often ensue, the retching and vomiting that sometimes endure for hours, cannot but have an injurious effect on the eye so recently laid open, besides rendering the patient unable to take nourishment and depressing his *morale*.

[1] Graefe-Saemisch, Handbuch, vol. v. pp. 341, 342.

Who that has used anæsthetics has not over and again realized these objections to their employment? Who, after visiting Continental *cliniques*, has not envied the facility with which operations are performed on conscious subjects, and watched with interest their convalescence? I have long wondered at the results obtained by certain European ophthalmologists, prominent among whom I will cite Arlt and Wecker,[1] results which, I frankly admit, those we have formerly obtained in Boston fall far behind. After repeatedly witnessing their operations, and following to some extent their cases, the question naturally suggested itself as to whether, after making all due allowance for great dexterity and constant practice, their success was not in part due to the avoidance of anæsthesia. Of this I became firmly convinced.

We are met with the stock objection that the sensibilities of the European peasant are blunter, and his power of enduring pain greater than is the case with the nervous American; that, as has already been remarked, those of the present generation in this country have a full realization of the facility with which anæsthesia may be obtained, and of the harmlessness of ether, as far as life is concerned, and that argument with people predisposed to insist on its use is therefore of little avail. Such

[1] In 1876 Professor Arlt informed me that for two years past he had met with a total loss of but 1.5 per cent. The Report of the *Clinique* of Dr. de Wecker for 1876 gives 222 extractions, and 3 total losses, a percentage of 1.35. At the Eye Infirmary in Boston our percentage of loss during 1875, and the three following years, was 6.7.

reasoning is purely theoretical, the difficulties thus conjured up being largely imaginary, and advanced by those having little experience in operating on conscious patients. *Solvitur ambulando*. For several years I have performed nearly all my extractions without ether, and have found my patients amenable to reason when the disadvantages attending its use were once explained to them. Nor have I experienced any special difficulty from their restlessness at the time of the operation; rather, indeed, have I been struck by the small amount of pain they appeared to suffer. In my limited experience it has even seemed as if the senile eye, affected by cataract, lost a portion of its normal sensitiveness, so many have assured me that the pain they felt was comparatively trifling. I have not in a single case found it necessary to use my fixation forceps after the section was completed, and, though invariably performing iridectomy, can find but a single dialysis recorded.

The argument may be summed up as follows: In operating without ether or chloroform we claim that congestion is avoided and hæmorrhage lessened; that the eye can be directed by the voice instead of by the touch of the operator, thereby decidedly facilitating the exit of the lens; that the eye-ball retains its fullness, rendering the manipulation for clearing the pupil of corticalis much easier; that the answers of the patient, as to how much he sees, give otherwise unattainable information as to the clearness of the pupil; and that subsequent nausea is avoided, enabling the patient to

take needed nourishment, not only before but even soon after the operation, and to dispense the earlier with the services of an attendant, — in hospitals a decided advantage. Last, but not least, his *morale* is maintained; he knows he sees, and looks forward with confidence, instead of doubt, to the removal of the bandage.

In view of the objections already cited, and fortified by the advantages just enumerated, I confidently assert that the routine employment of anæsthesia in the extraction of cataract is not consistent with the largest attainable measure of success.

The second question, as to *the use or non-use of mydriatics as preparatory to extraction*, may be briefly discussed.

The custom of preparing an eye for the performance of flap extraction, by dilating the pupil before the operation, was generally continued after this method of removing the cataract had given way to that introduced by Graefe. The old arguments for the instillation of atropine before extraction, are familiar to all; there would be more room for the knife in its passage across the anterior chamber, its point would be less likely to catch in the iris, and a wound or dialysis would consequently more seldom follow; the secondary dilatation that ensues on the reëstablishment of the anterior chamber would tend to keep the edge of the iris clear of any fragments of corticalis that might remain behind, and lessen the likelihood of a closed pupil and a secondary cataract.

Dr. Edward Meyer, of Paris, was the first to give up this practice. He drew attention[1] to the fact that where mydriasis had not been induced it was easier to replace the iris after extraction, and thus prevent its healing into the corners of the wound. In his anxiety to prevent this accident de Wecker went a step farther, and advocated[2] the application of a solution of eserine as soon as the lens was removed. Acting on the hint furnished by this distinguished surgeon, I have adopted the practice of applying the eserine an hour *before* the operation. At the end of this time, then, there is found a considerable myosis, which interferes in no way with the extraction, and returning, like mydriasis, with the reëstablishment of the anterior chamber, exerts on the iris a degree of traction that reduces to a minimum the danger of its healing into the corners of the wound, and, in my own experience, seems to render this complication less frequent than formerly. This contraction of the pupil readily yields to atropine, should it be found desirable to employ it during the after-treatment. Although cortical remains are, on the first examination, found to occupy the area of the pupil, the edge of the iris may generally be made to separate from them with readiness after repeated instillations of atropine. Theoretically, secondary cataract ought to follow more frequently, when its use is so long postponed. Practically I have not found this to be the case.

[1] Handbuch der Augenheilkunde. Berlin. 1875. Page 308.
[2] Therapeutique Oculaire, p. 466.

I use the salicylate of eserine, rubbed up with vaseline, finding this preparation to keep better than the ordinary solution. At first I followed de Wecker's suggestion of making the application at the time of the operation. But though the application of this drug, when pure, is unattended by pain, patients sometimes complained of an unpleasant thrill or "jumping sensation" in the eye, occurring at intervals for some time after its use. I prefer, therefore, to allow time for this to pass away. A single application is sufficient. When I first proposed this course (of applying the eserine in advance) Dr. de Wecker raised two objections to it, the first being that a contracted pupil would render the exploration of the nature of the cataract difficult; the second that the tendency to a loss of vitreous would be increased. To the first of these the reply is that the eye is supposed to have already undergone its examination, before the hour for operating arrives; to the second that such has not been my own experience.

Before discussing my third point, the question of after-treatment, a description of the manner in which I have been in the habit of performing the operation, when using no anæsthetic, may properly be introduced. It is one thing to operate leisurely when consciousness is suspended, another to induce the patient to forego the use of ether, to mitigate the dread with which the possible pain is regarded, and to make what must necessarily be borne as light as may be. What follows may perhaps be of

service to those induced to take a new departure by the perusal of the foregoing remarks on the disadvantages of anæsthesia.

It is my practice to have the patient enter the Infirmary, or the Hospital where I perform my private operations, the evening before the day for which the operation is appointed. The advantage of this is twofold. In the first place a certain amount of acquaintance with the bed, the surroundings, and the attendants is acquired, before the bandage that prevents all use of the eyes for eight days has been finally applied. And, in the second place, there is generally some convalescent who has already passed through the same ordeal, and who can be brought in contact with the intending patient. A few words of encouragement from such an individual will often do more to dispel apprehension and establish confidence than anything coming from the surgeon himself.

And, in this connection, the desirability of performing the operation away from home may well be insisted on. Independent of the fact that an establishment, specially arranged for the purpose, offers advantages of light, ventilation, quiet, and skilled attendance, with which no ordinary private house can compete, there is apt to be, under such circumstances, a freedom from care and anxiety that can rarely be secured at home. The strict, though brief, exclusion of relatives and friends, during the first twenty-four or forty-eight hours, prevents allusion to exciting topics, or consultation on household cares. Distance from the latter

induces, with the head of a family, a feeling of repose that close proximity would go far to destroy.

Early morning is selected for the operation, a good breakfast having been allowed, and the eserine applied, as has already been described, an hour or more in advance. The patient awaits the surgeon undressed and in bed. The eye that is not to be touched is closed by several short strips of isinglass plaster, crossing each other. A short preliminary drill in turning the eye in any given direction, without any corresponding movement of the head, will be found of much use, the patient being directed to roll the eye up, down, or to either side at the request of the operator, without straining and without holding the breath. In the case of very deaf people it is well to arrange a little code of signals in advance, a tap on the forehead being understood to mean a direction to look up, one on the chin to look down.

I employ no assistant in cases where ether is not given, though I always have a trained nurse in the room. The only service she ordinarily renders is handing the iced sponges as they are needed, and supporting the head while the bandage is being applied.

The operation proper may be divided into three parts; the first comprehending the cut, the iridectomy, and the opening the capsule; the second the delivery of the lens; and the third the clearing of the pupil and the reposition of the iris.

First part. The speculum having been introduced, and locked in such a position as to secure

a proper exposure of the eye without straining the lids, the patient is warned that the step about to be taken is accompanied by some pain. The eye is then seized with fixation forceps, over the insertion of the inferior rectus, and the knife entered and passed through the anterior chamber. The moment the counter-puncture is completed, the forceps are laid aside, and not used again during the operation. Directing the patient to look down, the section is slowly completed, care being taken to avoid the formation of a conjunctival flap, or to make this as short as may be. With as little delay as possible the iridectomy is now performed, the patient being again told to look down, and to keep as steady as he can, this being the critical moment of the operation, and pain substantially over when this is concluded. The forceps are introduced with the left hand and the scissors used with the right. It might be thought by some that the unrestricted motion of the eye would embarrass the performance of the iridectomy, but this I have not found to be the case, having never but once had a slight dialysis. The instant the iris has been excised the capsule should be opened, in advance, if possible, of the hæmorrhage that is now so likely to occur and to obscure this step. The speculum may now be finally removed, and the patient allowed to close the eye and enjoy a short interval of rest, iced sponges of small size being kept in constant apposition with the outside of the lids, for the double purpose of allaying pain and smarting, and of arresting any tendency to hæmorrhage.

I endeavor to make my iridectomy as small as possible. If, on the completion of the first cut with the narrow knife, the wound exhibits any disposition to gape, or if any other evidence is shown that loss of vitreous is threatened, from straining on the part of the patient, or pressure of the speculum against the eye, this instrument is removed and laid aside. In its place the upper lid may be raised and held up by means of the third finger of the left hand, while the iris forceps are held and manipulated with the thumb and forefinger. The capsule once opened, instrumental interference with the eye is now substantially over. The patient may be congratulated on having arrived at this stage, and encouraged to submit to what remains, as being painless, a mere "putting of the eye to rights," as Mr. Critchett used to call it in my student days at Moorfields.

Second part. The small pieces of iced sponge are removed from the lids, the upper lid raised and gently held against the edge of the orbit with the fingers of the left hand, and the clotted blood, if any is present, is removed. The cataract is then made to emerge by means of pressure from the caoutchouc spoon applied on the outside of the lower lid, the patient the while looking down. Direct contact of any instrument with the eye-ball should be studiously avoided. The only difficulty, at this stage, is to get the patient to direct his eye sufficiently downwards. The nurse may be told to press his hand or touch his foot, and thus excite him to fix his thoughts on the one or the other. It

is at this juncture that the tact and discretion of the surgeon are apt to be put to the proof. Patience and perseverance are often needed, and their exercise is almost certain to be crowned with final success.

The lens once removed, another brief interval of rest may be indulged in, the upper lid being allowed to fall.

Third part. It is in the clearing of the pupil that one of the greatest advantages of non-anæsthesia becomes manifest. To quote from one of the first of living operators: "The eye being made to look down, the upper lid is raised with one hand, and a gentle pressure and rubbing upwards effected with the other, through the tarsus of the lower lid, until the lenticular fragments are forced up and out. Much difficulty is experienced when the patient cannot bring himself to look down. In that case the eye-ball must be fixed, the Daviel's spoon moistened again and used for the purpose of rubbing upwards. It is assumed that we are not here dealing with an eye where there is danger of loss of vitreous."[1] This latter method must often, if not always, be adopted with etherized patients; bruising the eye by renewed fixation, and wounding the corneal epithelium by direct contact with the hard surface of the Daviel's spoon.

When the pupil is apparently clear, vision must be tested. If the answers are unsatisfactory, if the patient cannot count or name the fingers held before him, his head being of course turned away

[1] Arlt, Operationslehre, Graefe-Sämisch, vol. iii. p. 303.

from the light, the rubbing must be renewed. No inspection of the pupil by the surgeon gives information comparable to the actual exercise of vision by the patient himself; nor should the bandage be applied until this vision is reasonably good. If, indeed, there were no other reason for this course, the advantage of the moral effect produced on the patient can scarcely be overrated.

The removal of the iris from the corners of the wound, and its careful reposition by means of the rubber spatula used by de Wecker for that purpose, concludes the operation and leaves the eye ready for the application of the bandage.

The above description of the operation of modified linear extraction by no means professes to be a full account of Graefe's method, but simply undertakes to give a few suggestions with reference to some of the details of its performance; details that might, perhaps, be lost sight of by those habituated to the routine administration of anæsthetics.

The final question I would raise is: *How soon, after the performance of the operation, shall the lids be separated and the first examination made,* if there be no reason for supposing that anything has occurred to complicate the healing process?

I was never inclined to agree with those who advised a hasty inspection of the eye on the day of the operation, but deferred this usually to the end of twenty-four hours, changing the bandage and lint, and washing the outside of the eye within twelve hours, but never separating the lids. The

next day I would simply glance at the cornea by the light of a single candle, but not use oblique illumination till the third or fourth day. Gradually I came to find that the eye did quite as well if the lids were allowed to remain closed two and even three days, the dressings of course being changed daily. And, as time went on, a new fact forced itself repeatedly on my notice: that in certain cases where the healing process was interrupted by inflammatory complications, the first pain, lachrymation, or discharge followed accurately on the first separation of the lids, however carefully managed, and however hasty the examination. The case might have been doing perfectly well for three or four days; no swelling of the lids, lachrymation, or undue discharge might have been present, or the slightest pain experienced; the eye might then for the first time be opened and rapidly surveyed by a weak light, no lens being used and no trial of the vision made, and yet within a few hours pain would occur, and marked symptoms of inflammation be present. This happened so frequently that it became impossible not to connect the examination and the inflammation as cause and effect. Acting on this belief, I kept prolonging the time that I allowed the eye to remain unopened, *and now rarely make my first examination before the morning of the eighth day.*

Supposing the extraction to have been performed in the early morning, my present practice is to remove the bandage at about five in the afternoon, and bathe the outside of the lids with tepid water, a fresh bandage and lint being then applied. The

severe pain that in some exceptional cases occurs a few hours after the operation I have often seen yield to gentle sponging with iced water, a single application being generally sufficient. The next morning I again remove the bandage. If everything is doing well, if there is no swelling, undue secretion, or lachrymation, the bandage is reapplied, and after that changed but once a day. Thus the case is allowed to go on for seven days, if all seems, from external inspection, to be progressing favorably. On the morning of the eighth day I open the lids. Those who are themselves accustomed to make an earlier examination are often astonished to see how little evidence of the operation is present, a trifling redness in the immediate vicinity of the wound being sometimes all there is to be seen. Atropine may now be used if circumstances render it advisable; many cases, however, do not require it at all. The eye is now closed and allowed, for a day or two, to remain so, but a shade is substituted for the bandage, the room still being darkened. The redness about the wound, slight at first, will be observed for several days after opening steadily to increase before it begins to disappear.

The above course of treatment is applicable only to cases where the healing process may be presumed to be progressing normally. I believe that the longer the examination is deferred, the more likely the patient is to do well, and this not on the ground of any preconceived theory, but simply from experience. I am aware that numerous theo-

retical objections to such a method might be alleged. It could be argued that the secretions of the wound and the blood left in the conjunctival sac, being unable to escape, might decompose and act as sources of infection. These and other objections may be brought forward on theoretical grounds. To those who urge them I would simply suggest a fair trial of the plan itself, believing they will in the end themselves find that the longer they leave the wound undisturbed, in contact with and guarded by the covering provided by nature, thus sealed and protected from any germs of contagion with which the atmosphere may be infected, and which the exposure of a single instant might attract, the more success they will meet with in the after treatment of extraction.

I now append the statistics of one hundred extractions in which these hints were acted on, and contrast them with a similar number of cases in which anæsthesia was employed, mydriatics used, and the eye examined within a shorter period after the operation than above advised, — the whole occurring in my own practice. These cases were not selected, but were simply instances of hard, uncomplicated senile cataract. For the sake of convenience, they are grouped under two heads, viz., with and without anæsthesia. It is to be understood, however, that those coming under the second head were operated on with the pupil under the influence of eserine, and that the eye, in each instance, was not examined for a week or more after the operation.

TABLE.

	100 Cases with Ether.	100 Cases without Ether.
Percentage of cases occurring in private practice	30	42
Average age	61.7	65.8
Loss of vitreous	14	9
Duration of treatment	18.3 days.	16.5 days.
Secondary operations	22	14

RESULTS.

Vision = 1	1	1
Vision = 0.9	–	3
Vision = 0.8	–	–
Vision = 0.7	6	4
Vision = 0.6	–	3
Vision = 0.5	1	8
Vision = 0.4	13	18
Vision = 0.3	20	12
Vision = 0.2	22	31
Vision = 0.1	18	9
Success V. 0.1 and more	81	89
Partial success, V. $\frac{1}{12}$ to $\frac{1}{60}$, but including ability to get about unattended	8	9
Reasonable prospect of success on performance of secondary operation	2	1
Failure	9	1
	100	100

It will thus be seen that, of the first 100, 91 recovered, or are likely to recover, an appreciable amount of useful vision. Of the second 100, 99 were thus fortunate. The percentage of loss in the first series is confessed to be unduly large; and that that of the latter will be steadily maintained,

by following out the method, it is not of course claimed. But that this method has had, in my hands, a decidedly greater measure of success than the other there is no room for doubting; and it can safely be said that this increased success did not depend on additional experience in operating, or increased manual dexterity due to practice.

The single case of failure in the second hundred was discharged from the hospital on the fifteenth day. Moderate inflammation had followed the operation, but, at the time of discharge, though the pupil was blocked with cortical remains, the anterior chamber had long been reëstablished, redness had disappeared, and there was good perception and projection. Not long after the patient had returned home severe pain came on, followed by suppurative choroiditis, which ultimately necessitated enucleation.

The nine cases of failure in the first series were due, in six instances, to corneal suppuration; in two to cyclitis depending on the presence of cortical remains; and in one to panophthalmitis.

As has been already stated, none of these were selected cases, but taken in the order of their occurrence, in private and in hospital practice, — uncomplicated senile cataracts, with good perception and projection. Of the second series a single case, however, has been skipped, and the hundred made up by adding what would properly be the hundred-and-first. A man, aged seventy-five years, very restless during the operation, the performance of which was thus rendered unusually difficult, was

discharged on the fifteenth day, with excellent perception of light, but with a pupil blocked with rapidly absorbing corticalis. He was ordered atropine, and told to report at regular intervals. This he promised to do, but, instead, returned at once to his distant home, probably abandoned all treatment and all care, as regards the use of the other eye, and is reported by letter to have undergone a painful inflammation, and lost the eye. I never saw him again, but think I am justified in rejecting the case from my list, as ordinary prudence and obedience to directions would, in all probability, have resulted in the restoration of useful vision.

In the annual reports of the Massachusetts Charitable Eye and Ear Infirmary for 1878 and 1880, it is undertaken to compare the results of operations for extraction performed with and without anæsthetics during these years. The percentage of success inclines, each year, very slightly in favor of the operations done without ether. I desire, however, to protest against the value of any inference from these statistics. The cases occurred in the practice of at least six surgeons — experienced operators, it is true, but using each his own method, and all previously accustomed to the regular employment of anæsthesia. Now, the object of this paper is not to claim that the *mere avoidance* of anæsthesia is likely materially to further the success of extraction, without an intelligent utilization of the advantages a state of consciousness places at our command. These advantages, as already stated, consist, in part at any rate, in the power of the patient to direct his eye

by an effort of the will, and in his ability to inform the surgeon, at the close of the operation, as to the clearness of his vision. A surgeon who maintains the use of the fixation forceps through the operation, dragging the eye-ball hither and thither by an instrument the application of which is exquisitely painful, and a surgeon who obtains what seems to him a clear pupil at the close of the operation, but closes the eye without testing vision, and going again to work, if the test be unsatisfactory, until clearer sight is obtained, fails to appreciate the advantages of non-anæsthesia, and is not entitled to point a moral by the results he secures. As my colleagues at the Infirmary have not, as yet, in all instances acted on this understanding, I cannot admit that their figures, good as they are, may not ultimately be improved.

The operations here reported were all performed according to the method of von Graefe, the single departure therefrom being in the cut itself, which was more corneal and less linear than that originally recommended by him.

ONE HUNDRED CASES OPERATED ON WITHOUT ANÆSTHESIA.

No.	Sex.	Age.	Remarks.	Length of Treatment in Days.	Secondary Operation.	Result
1.	F.	87	.....	10	.....	0.2
2.	M.	64	.....	18	.....	0.4
3.	F.	61	Some capsule left in pupil.	14	Operation proposed..	0.15
4.	M.	61	Slight iritis.....	14	.....	0.1
5.	F.	56	Cataract immature; some cortical remained behind.	17	.....	0.4
6.	M.	61	Iritis; pupil filled with membrane.....	25	Capsule operation...	0.2
7.	F.	76	.....	14	.....	0.7
8.	F.	49	.....	14	.....	0.3
9.	F.	61	Cataract immature.....	15	.....	0.3
10.	F.	55	.....	18	.....	0.7
11.	M.	61	.....	16	.....	1.0
12.	M.	55	.....	16	.....	0 2
13.	F.	68	Hypermature; vitreous lost; iritis followed.....	27	Capsule operation...	0.2
14.	F.	60	Some loss of vitreous; tedious convalescence.....	35	.....	0.1
15.	F.	49	.....	15	.....	0.35
16.	M.	69	.....	10	.....	0.4
17.	M.	72	Patient rheumatic; iritis and closed pupil followed.	46	Secondary operation	0.3
18.	F.	68	Iris tremulous; some loss of fluid vitreous; low iritis.	27	.....	0.05
19.	M.	69	.....	10	.....	0.25
20.	M.	41	.....	9	.....	0.33
21.	M.	60	.....	9	.....	0.15
22.	M.	62	Struck eye a severe blow during convalescence....	14	.....	0.25
23.	M.	71	Mild iritis.....	17	Capsule operation...	0.5
24.	F.	55	Six days later, hæmorrhage into anterior chamber...	21	.....	0.5
25.	M.	73	Feeble; rheumatic; iritis and closure of pupil....	47	Capsule operation...	0.2
26.	M.	78	.....	15	.....	0.25
27.	F.	72	Immature. Iritis.....	18	Secondary operation	0.05
28.	M.	55	At discharge pupil filled with capsule; told to return.....	24	.....	0.2
29.	F.	57	Capsule in pupil; to return	13	.....	0.1
30.	M.	77	.....	13	.....	<1.0
31.	M.	72	Pupil, at discharge, filled with capsule; to return.	13	.....	
32.	F.	72	Slight loss of vitreous; scoop used; acute mania on sixth day.....	6	.....	0.2

ONE HUNDRED CASES OPERATED ON WITHOUT ANÆSTHESIA — (Continued).

No.	Sex.	Age.	Remarks.	Length of Treatment in Days.	Secondary Operation.	Result.
33.	F.	60	.....	13	.....	0.5
34.	M.	72	Senile delirium during convalescence.....	15	.....	0.2
35.	F.	60	Blow on eye five days after operation; iritis and closed pupil; to return..	16	.....	Counts fingers at 1 metre.
36.	M.	60	.....	15	.....	0.5
37.	M.	60	Capsule in pupil; to return	11	.. ..	0.06
38.	F.	89	.....	12	.....	0.2
39.	F.	63	Slight iritis.....	17	.....	0.7
40.	F.	76	.....	15	.....	0.1
41.	F.	75	.....	18	.....	0.2
42.	M.	77	Slight iritis.....	20	.....	0.2
43.	F.	65	Slight loss of vitreous.....	14	.....	0.4
44.	F.	63	Iritis.....	26	.....	0.2
45.	M.	70	Corticalis fluid; nucleus removed by scoop.....	14	.....	<1.0
46.	F.	65	.....	12	.....	0.3
47.	M.	70	Capsule left in pupil.....	14	Capsule operation...	0.5
48.	M.	62	.....	16	Capsule operation...	0.4
49.	M.	78	.....	14	.....	0.3
50.	M.	72	.....	14	.....	0.2
51.	M.	70	Capsule left in pupil.....	14	Secondary operation	0.33
52.	F.	58	Capsule left in pupil.....	17	Secondary operation	0.33
53.	F.	68	Scoop used; slight loss of vitreous; iritis.....	31	.....	0.2
54.	M.	72	Capsule left in pupil.....	14	Capsule operation...	0.15
55.	F.	73	.....	16	.....	0.33
56.	F.	47	Subsequent examination discovered floating opacities in vitreous.....	14	.....	0.25
57.	F.	50	Some cortical could not be removed.....	16	Secondary operation	0.2
58.	F.	60	Slight iritis.....	19	.....	0.16
59.	F.	62	....	14	.....	0.7
60.	M.	73	.....	14	.....	0.5
61.	F.	63	Patient had albuminuria..	14	.....	0.11
62.	F.	47	.....	13	.....	0.3
63.	F.	60	Capsule in pupil at time of discharge; patient did not return.....	13	.....	0.17
64.	F.	63	Patient had Bright's disease, of which she died within a year.....	21	.....	0.14
65.	M.	55	.....	14	.....	0.33
66.	M.	64	Iritis and closure of pupil..	18	Secondary operation	1.0
67.	F.	67	Iritis.....	19	.....	0.5

ONE HUNDRED CASES OPERATED ON WITHOUT ANÆSTHESIA — (Continued).

No.	Sex.	Age.	Remarks.	Length of Treatment in Days.	Secondary Operation.	Result.
68.	F.	77	Slight loss of vitreous in attempting to remove capsule.....	14	Secondary operation	0.6
69.	M.	75	Very rheumatic; iritis followed, with closure of pupil.....	15	Secondary operation	0.3
70.	F.	81	Much bleeding; lens very sticky; tedious convalescence.....	30	.....	nearly 0.1
71.	F.	78	Much hæmorrhage, not wholly absorbed at discharge.....	19	.....	0.16
72.	F.	73	Capsule left behind; patient did not return for secondary operation....	16	.....	0.07
73.	F.	65	.....	16	.....	0.25
74.	M.	77	Retinal separation discovered just before discharge.	18	.....	0.025
75.	F.	65	.....	14	Capsule operation...	0.5
76.	M.	73	.....	14	.....	0.3
77.	F.	66	Acute mania after operation, ungovernable; bandage removed; hemorrhage supervened.....	17	.....	0.07
78.	M.	62	.....	12	.....	0.4
79.	F.	68	Suppurative choroiditis on twentieth day; eye subsequently enucleated....	15	.....	0.
80.	F.	63	.....	18	.....	0.3
81.	M.	68	.....	13	.....	0.25
82.	F.	63	.....	15	.....	0.4
83.	F.	52	.....	14	.....	0.33
84.	F.	72	.....	15	.....	0.3
85.	F.	76	.....	14	.....	0.25
86.	M.	51	.....	14	.....	0.3
87.	F.	69	Cataract immature; iritis; closure of pupil.....	18	Secondary operation	0.5
88.	F.	39	Slight loss of vitreous.....	18	.....	0.5
89.	F.	70	.....	15	.....	0.33
90.	F.	75	.....	14	.....	0.2
91.	F.	71	Much capsule left in pupil; patient did not return, as requested.....	15	.....	0.05
92.	M.	72	Scoop used.....	13	.....	0.16
93.	F.	52	.....	13	.....	0.4
94.	M.	66	.....	11	.....	0.3
95.	M.	64	.....	12	.....	0.6

ONE HUNDRED CASES OPERATED ON WITHOUT ANÆSTHESIA — (Continued).

No.	Sex.	Age.	Remarks.	Length of Treatment in Days.	Secondary Operation.	Result.
96.	M.	74	.....	11	.....	0.14
97.	M.	65	.....	12	.....	0.23
98.	M.	58	Slight loss of vitreous; scoop used.....	22	.....	0.16
99	F.	70	Iritis.....	28	Secondary operation	0.45
100.	M.	82	.....	16	.....	0.1

Seventy-two, out of the two hundred cases, occurred in private practice, and were all operated on in the Carney Hospital, South Boston. Forty-two of these were done without ether, the result being forty-one full, and one partial success. It would be unjust, as well as ungrateful, did I not record my conviction that no small share of this result is due to the intelligent, faithful, and devoted care bestowed on these patients by the Sisters of Charity who conduct the institution.

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