

THE OPERATION FOR CATARACT.*

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At the beginning of my work in ophthalmology what most impressed me in connection with the operation for cataract was the ease of its accomplishment. This is to be accounted for in a measure by the fact that I was fortunate in seeing a number of exceptionally skilled operators, and an operation, like many other things, appears simpler and easier the nearer it approaches perfection. After nearly twenty years of operating, the view point is naturally a different one and my attitude is probably that of most men who have performed a number of hundred extractions. I now realize that it is not as easy and simple as it at first appeared and I am continually on the outlook for new points and suggestions. Most of us appreciate the advantage of seeing other surgeons operate and it is a matter of regret that a busy life gives so little opportunity for thus adding to our knowledge. There is, however, something to be gained by an exchange of individual opinions on the various points of technique, etc., and in presenting this paper to the Society, I shall hope for a very general discussion.

In operating it is safe to say that all men prefer a thoroughly mature cataract, a chamber of good depth, a pupil that dilates well under a mydriatic, a quick light perception and good projection. While the absence of one or more of these favorable conditions does not of necessity contraindicate operation there is often a marked difference of opinion expressed in advising the patient. The complete maturity of the lens is not so much insisted upon as it was fifteen or twenty years ago. If the vision of the second eye is so defective that the patient is unable to read, get about satisfactorily or carry on his usual occupations, I do not object to operating on a lens that is swollen and the chamber narrowed, nor do I hesitate, under these conditions, if a certain amount of the lens is still transparent. There is one class of immature cataract where operation is, it seems to me, needlessly delayed. I refer to an extremely slowly developing nuclear variety that I have seen more often in the later part of middle life and not infrequently in myopic eyes. The anterior chamber is of good depth, sometimes deeper than normal. The central opacity is usually dense and well defined, with a number of striations extending towards the periphery while the larger proportion of the lens substance is transparent. The location of the opacity, however, and the resulting irregular astigmatism, give rise to a very defective vision that is little if at all benefited by glasses or mydriatics. As both eyes are apt to be involved to about the same degree, and the waiting for maturity is a question of years, the condition is naturally a discouraging one for the patient. In two or three of these cases I have attempted ripening by making a free descision of the cortex, but there was no

swelling of the lens substance and the opacity produced extended little beyond the area directly involved in the needling. I have ended by doing an extraction and think in the future I shall not attempt a descision but extract in the beginning. The eyes have been unusually free from infection and have made good recoveries.

It is perhaps unnecessary to say that visual statistics should never be considered in deciding for or against operation. The fact that an iris is discolored or tremulous, that there are numerous posterior synechæ, opacities of the cornea or even faulty projection should not prevent one from operating if the patient is blind and there is a chance of improving his condition. To a man blind the ability to count fingers even at a distance of two or three feet will be of inestimable value and if he is properly constituted as to temperament, it will be duly appreciated. Temperament is a factor that must always be reckoned with in considering the results of a cataract operation. The patient with 20/200th vision is often the contented, grateful patient, and the one with 20/20th as often the chronic grumbler. While the absence of light perception of course forbids operation, except for the cosmetic effect, it is to be remembered that an occasional patient will be met with who absolutely refuses to see light, even after repeated trials, in spite of the fact that the pupil reacts satisfactorily. Such cases are probably naturally stupid and having been told that they must be blind before they can be operated upon, insist on being absolutely blind. It is unusual nowadays for a man to advise against extraction because of extreme old age, and the results are often surprisingly good even when the patient's general condition is far from satisfactory. I wish in this connection to report briefly a private case I operated on in 1904 as the exceptional acuteness of vision in a woman eighty-five years of age is worth recording. The sight had been failing gradually in both eyes for seven or eight years. One eye had been operated on the year before I saw her and the result had not been fortunate. An oculist who had examined the eyes two or three years earlier wrote me that the opacity was so far back that he had located it in the anterior part of the vitreous so that it evidently began near the posterior capsule of the lens. In the fall of 1904, as the lens was entirely opaque, operation was advised and accepted. The extraction was with iridectomy and the recovery perfectly normal. She reported in November, 1905, and the visual result was as follows: At a distance of twenty feet with a +11 = +3, cylinder axis 0, she read the 20/15 line without hesitation including the last letter, a B, which two-thirds of my refraction cases fail to name at this distance. She then read correctly with the exception of three letters the 20/12 line. There had not been a secondary and the clearness of the media and healthy condition of the fundus as indicated by this vision is certainly unusual in so old a patient.

In a case of mature cataract in one eye and good vision in the other is operation advisable,

* Read before the New England Ophthalmological Society, Feb. 13, 1906.

or is it better to delay until there is a marked failure of vision in the second eye? There is naturally a difference of opinion on this point although it is probably safe to say that the majority of men advise waiting. Personally, while I do not urge operation, if the patient lives in the city or other thickly settled community, there is much to be said in its favor and I regard it as perfectly justifiable. It is not, of course, often practicable to wear a cataract glass but nevertheless the ability to see even dimly large objects approaching from the side, — electric cars, automobiles, etc., without having to turn the head as one must continually with but one eye, — is a decided gain and will be an additional protection against accidents. Especially is this so if the patient is more or less deaf and, in consequence, unable to accurately locate approaching objects by sound.

In considering the question of antiseptics it must be admitted that the ophthalmic surgeon labors under decided disadvantages. The thorough scrubbing with soap and water, alcohol, ether, etc., which is so valuable to the general surgeon in preparing his field of operation is, of course, not applicable to the conjunctival sac, and we have most of us learned by experience that unless we can make use of germicides that are practically non-irritating it is better to use nothing at all aside from irrigation with the normal salt or other mild solution. It seems impossible with our present knowledge to have a conjunctival sac free from micro-organisms, and all that we can hope to accomplish is to reduce their number or lessen their activity. During my last Infirmary service, I made use of a 25% argyrol solution, using it as a collyrium (t.i.d.) for three days preceding the operation and at the daily dressings following. It does not render the conjunctival sac sterile, as shown by the bacteriological examinations kindly made for me by Dr. Vierhoff. Nevertheless, the eyes have been exceptionally free from infection and conjunctival discharge and as far as can be judged from so short an experience it is of a decided practical value. When we consider the micro-organisms found in the normal conjunctival sac, that the lids are closed and the eyes bandaged for a number of days after the operation and everything thus made favorable for their multiplication and development, it certainly seems remarkable that infections are so infrequent. The most reasonable way to account for this is, it seems to me, that the constant flow of aqueous from the anterior chamber effectually irrigates the corneal wound until union has taken place. I believe that most infections are made at the time of the operation and that the instruments which enter the interior eye are the means of infection. If this is so, it is important not only to thoroughly sterilize our instruments but to use the greatest care when passing them into the anterior chamber that they come as little as possible in contact with the outer surface of the globe. For the same reason, the fewer instruments that enter the anterior chamber the less chance of infection, and

to remove and re-enter an instrument is always to be avoided unless absolutely necessary. The cleansing of the lids and integument adjacent to the eye, the thorough scrubbing of the hands, the sterilization of instruments, bandages, etc., has, of course, become a routine practice with every operator although there is naturally some variation in their individual methods. In my private operations the instrument case, dressings, cotton, towels, bowls, droppers, bottles of collyria, in fact, everything that I am to use about the eye is placed in Shearings' Formalin Sterilizer and sterilized. My instruments, after being boiled for ten minutes, are then placed in the case, the case left open, the lamp again lighted, the sterilizer closed and not opened again until the following morning at the time of the operation. My cataract knives are an exception to the ten minutes boiling, but I dip them in boiling water for thirty to forty seconds before placing them in my sterilizer. Gowns are worn by myself, assistant and nurse; also caps with pucker-string, which cover the hair much better than any other form I have seen, and gauze masks covering the mouth and nose. These are, of course, sterilized either by steam or formalin. The mask seems to me of special importance not only for the protection of the wound but of the sterilized instruments which are to enter the anterior chamber. In this connection the experiments of Dr. A. H. Levings of Milwaukee ("Surgical Bacteriology of the Mouth," *The Journal of the American Medical Association*, Aug. 12, 1905) are interesting, and the following which I quote especially so:

"Examinations were made to determine the number of bacteria thrown from the mouth in ordinary conversation, forced, explosive expiration and in coughing.

"A plate exposed for two minutes just in front of the mouth during ordinary conversation showed 235 colonies. A plate exposed for one minute at the distance of five feet during forced expiration showed 105 colonies. A plate exposed for one-half minute at the distance of five feet during explosive expiration showed 192 colonies. A plate exposed at a distance of ten feet showed 35 colonies after five forcible coughs. A plate exposed at a distance of 20 feet showed a development of 23 colonies after ten forcible coughs. These examinations were made in a bathroom which had no ventilation and was practically free from germs, so that a plate exposed for five minutes in quiet showed the development of but three colonies. In other experiments plates were exposed at the distance of five feet and coughed at five times forcibly with one, two and three thicknesses of gauze in front of the mouth. The plate exposed with one thickness of gauze in front of the mouth showed a development of 156 colonies. The plate exposed with two thicknesses in front of the mouth showed a development of 35 colonies, and the plate exposed with three thicknesses in front of the mouth showed a development of 8 colonies."

Gowns, caps and masks are worn at my dress-

ings until the wound is well closed. An assistant or nurse removes bandages, with the exception of the pad or cotton directly in contact with lids which I remove myself. I wear rubber gloves in my Infirmary dressings as it is easier to cleanse them in going from case to case than it is the hands. The chance of infection from currents of air, open windows and doors in the operating room must not be lost sight of, though the natural protection of the eye, and short duration of the operation makes this perhaps a less important consideration than in general surgery.

To manage one's patients satisfactorily is an important factor in the success of the operation and in the making of a good operator. The personality of the operator, of course, counts for much and methods that may prove successful in one man's hands may be entirely unsuccessful in another's. In my experience, the less fuss and talk made about the operation the better. It is advisable to explain to the patient, in as few words as possible, the amount of pain to be expected, the importance of not moving the eye except when told to, of not talking, etc.; but to impress them too much with the gravity and seriousness of the undertaking is certainly a mistake. That it is "all in a day's work," an every-day occurrence with the operator and that success is the rule, is the better attitude to adopt. The management of the case should, so far as possible, be entirely in the hands of the operator. If the assistant tells the patient how to look, the nurse holds up the finger as a point of fixation or someone else offers a suggestion, it will lead to confusion. After the speculum is introduced, it is a good rule that no one but the operator should speak or in anyway interfere with the patient unless asked to. During the operation, it is well to talk quietly and encouragingly. To speak firmly or even scold an unruly patient is sometimes necessary. To lose one's temper, however, is, of course, a mistake, though the provocation that a stupid, pig-headed patient will sometimes give is almost irresistible.

As a local anesthetic, for the last few years, I have used a 1% solution of holocaine in the place of cocaine. As the effects of the latter (cocaine) pass off, there is usually more or less smarting and a general feeling of irritation that it seems to me is absent with the holocaine. As a consequence there is one less cause of annoyance, at a time when the patient is naturally nervous, and so less tendency to squeeze the lids and disturb the bandage.

Being ambidextrous, I always stand behind my patient. The want of ambidextrousness certainly in no way interferes with a good operation if a man is in other respects capable, but its possession is a distinct advantage and should, if possible, be acquired.

The introduction of the speculum is a simple thing, but if the globe is pressed upon unnecessarily, or the lids stretched too widely open, the patient may be frightened at the beginning and as a result restless and hard to manage during the entire operation. A most important thing

to avoid is the stretching of the outer canthus which adds so much to the discomfort caused by the speculum. After it is introduced, therefore, the arms of the speculum should be brought near enough together so that this is avoided, even if in some nervous cases it means a considerable narrowing of the palpebral aperture.

In fixing the eye, I grasp the conjunctiva little below the cornea, which is probably the position preferred by most men. I have noticed, however, that some operators apply the forceps just beyond the inner corneal border. It has seemed to me that the conjunctiva in this region, perhaps for the reason that it is often more or less thickened in elderly people, did not yield readily to local anesthetics and that its consequent sensitiveness made it especially undesirable as a point of fixation in any operation.

In making my corneal cut, I try to confine it to the limbus from start to finish. If it is completed too far forward there is a greater liability to anterior synechæ, and if it is carried backward involving the conjunctiva at any point, there may be bleeding into the anterior chamber which will often interfere greatly with the smoothness of the operation. The position of the incision is of little consequence, however, in comparison with its size, for a corneal cut that is too small is accountable for more bad results to my mind, than any other fault in technique. It is impossible to say just how much of the corneal circumference should be included, as the size of the lens may be out of all proportion to the size of the cornea. The mistake is oftenest made when the cornea is small, and if a good sized lens happens to be well sclerosed, trouble will be sure to follow. A corneal cut is rarely too large, and it is a good rule in every case to make it a little larger than seems absolutely necessary.

In regard to the question of extraction with or without iridectomy, while I am not opposed to the simple extraction and do this operation when the conditions are favorable, I find that I incline more and more to iridectomy, as I continue to operate. A small, well-made iridectomy is not a blemish and to my mind in no way detracts from the acuteness of vision. Statistics on this point are of doubtful value, as so many other factors must be considered besides the presence or absence of a coloboma. The question of prolapse of the iris is an important one in connection with simple extraction and I will here refer briefly to the condition that most strongly indicates to me the probability of this unfortunate result taking place. I think it is generally conceded that the mechanism of prolapse in the majority of cases is as follows: The corneal wound having united and the anterior chamber re-established, the lips of the wound suddenly separate from some cause, and the iris is carried outward by the escaping aqueous. The point I wish to make is, that in certain cases a greater tendency to prolapse exists than in others for the reason that there is a greater tendency to a separation of the corneal wound and evacuation of the anterior chamber. Also that this tendency can

usually be recognized at the time of the operation and when recognized is an indication for an iridectomy. If, after a simple extraction is completed the patient is instructed to look downward as far as possible, it will be found in the majority of cases that there is little if any tendency to a separation of the edges of the wound. In a certain number, however, a very marked separation will be noticed and it is in these cases that a prolapse is most liable to occur. For it can be readily understood that with so marked a predisposition of the edge of the wound to separate, a movement of the eye downward after the anterior chamber is re-established, but before firm union has taken place, is much more liable to result in a sudden evacuation of the aqueous and prolapse of the iris than in cases where no such tendency exists. In giving prominence to this condition as a cause of prolapse, I do not wish to be understood as believing that it is the only cause or that its general recognition will do away entirely with prolapses. I simply present it as an important causative factor that has not, so far as I am aware, received the general recognition which I am confident that it deserves.

It is perhaps hardly necessary to mention the importance of entering and withdrawing the cystotome heel first and thus avoiding any entanglement of the iris. I usually enter the anterior chamber near the right angle of my corneal wound carrying the cystotome obliquely to a point below the center of the pupil and after making the usual T-shaped opening in my capsule withdraw it obliquely to the left. Two years ago in a number of cases I divided my capsule with the point of the knife after making my puncture. It is not a difficult thing to do and in no way interferes with the proper completion of the corneal incision, if the pupil is of good size and the anterior chamber of moderate depth. My reason for giving it up was that the T-shaped cut in the capsule could not be made and there was consequently more difficulty in removing the lens. This method is, I believe, satisfactorily practiced by some surgeons, and the lessening by one of the number of instruments entering the eye is certainly a point in its favor.

In doing an iridectomy I aim to make a small one and so include as little as possible of the iris tissue in the forceps points, and cut with my scissors from below upward, that is, from the pupillary border toward the periphery.

With a good sized corneal incision, there is rarely any trouble in removing the lens, but most of us are occasionally caught with too small a wound. When the lens is a third or more delivered, the well-known method of having an assistant rotate it laterally with the iris forceps or some other instrument will often help one out of the difficulty. If it does not, a prompt enlargement of the cut or even the use of the scoop is preferable, I believe, to a prolonged manipulation of the eye. Neither does it seem to me necessary or desirable to spend much time in trying to remove small amounts of cortical. It absorbs quickly, as a rule, and much of the trouble

that it was formerly held accountable for is now more reasonably attributed to infection. If the nucleus is entirely removed a very large amount of remaining cortical causes me no anxiety, though I, of course, prefer to have it out, as absorption is not always rapid and a secondary is more often necessary. The various instruments devised for irrigating the anterior chamber have never appealed to me; first, because as I have just said, I believe the presence of cortical rarely interferes seriously with a good recovery and, second, because it means the introduction of one more instrument into the wound which I regard as a serious objection unless it contributes very materially to the success of the operation.

A source of infection in certain cases is probably the fluids — aqueous, lachrymal secretions, etc., — collected in the lower cul de sac after it has washed the conjunctiva pretty thoroughly, and is likely to be well laden with bacteria. Unless this is removed by occasional sponging the ends of the corneal wound are sometimes well bathed in it when the eye is rotated downward. Especially is it important to see that this space is well dried before removing the speculum, as the closing of the lids may force this collection over the entire length of the incision. In removing the speculum, it is also well to remember that some patients seem to take a solid satisfaction in giving the lids a good squeeze as soon as it is out or even half way out and it is therefore best to tell them when you are to do it and to caution them against closing the lids until they are told to and then to close them gently. I have always used atropine after my operations. It has never seemed to me to increase the danger of prolapse, and it is certainly an advantage to get mydriasis as early as possible.

I have used various bandages and have returned to the one I began with, the old Berlin knit bandage, as being on the whole the most satisfactory. As to after treatment, my patients are kept in bed for two to three days, the dressings changed daily, and the bandage removed permanently on the seventh or eighth day. Atropine is instilled, and, as I have already said, a 25% solution of argyrol, at each dressing. I have tried getting my patients up on the first day, of not disturbing the eye until the second or third day, of removing the bandage permanently earlier than the seventh day and various modifications suggested by other operators, but the more conservative after-care that I was taught as a house-officer, I have found to give the best results, and I think the same opinion is held by most of my Infirmary colleagues.

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MOSQUITOES IN NEW JERSEY. — The bill appropriating \$350,000 for the purpose of mosquito extermination in New Jersey passed the Senate last week. The cost of draining with the processes devised by the Mosquito Department is about \$1.40 an acre. Newark last year drained 3,500 acres at an expense of \$5,000. The appropriation about to be made will dry up all the 200,000 acres of marsh land still remaining. The work, it is calculated, will take five years. — *Medical Record.*