HOW SHOULD CATARACT OPERATIONS BE PERFORMED?

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That the technique of cataract operations is the most important element in success, no ophthalmic surgeon questions. Every improved step in the removal of an opaque lens has advanced the percentage of cures, until failures are the very rare exception, to a generally acknowledged fact that cataract extractions, formerly so fatal to the eye, have become the most perfect of surgical procedures. As a young graduate I found myself in Paris, the pupil of the elder Desmarres, when cataract extraction was by no means a common operation because of its difficulties, its dangers and its frequent failures. The common cataract operation of my early professional life was couching, a procedure that most of the ophthalmic surgeons of the present day have never seen performed. As you know, it was the displacement of the opaque lens from its capsular bed in the vitreous chamber, so as to free the pupil and allow light to form pictures upon the retina. The immediate and momentary results of this operation were very brilliant. The staff needle was the magician's wand. With it the blind eye was apparently touched, and sight was instantly restored. In the twinkling of an eye, from seeing nothing, the patient could behold the face of the surgeon who had performed this miraculous cure, and would be loud in his expressions of gratitude. The operation bore success upon its very face, and was declared such to the admiring class of professional attendants. This was in the early days of Napoleon the Third, and in France chin beards were in favor. If the surgeon were ambidextrous, he would steady the head of the male patient firmly, holding the beard with one hand, while with the other he would plunge the needle into the temporal side of the eye, and make the point appear in the pupil from behind the iris. In a moment the lens would be forced out of its position, through hyaloid tissues, into the lower part of the vitreous chamber, where it would be left resting against the retina and ciliary border. By changing hands in case of double cataract, the other eye would be in like manner impaled, and the lens displaced from before the pupil. This performance was truly the *coup d'état* of the operating room. Two brilliant, successful operations for cataract would be scored. The lids were then closed by strips of black court-plaster, and the patient sent to the ward, from which only a limited number reappeared with sight. In a large number of those operated upon, painful inflammations would sooner or later set in, to the de-

struction of the vision which a momentary glimpse had promised to the patient.

At that time, when couching was of daily occurrence, I saw but very few extractions. The operation was deemed too serious for general application, and was rarely attempted by the most skilful. For it patients were selected and were carefully prepared by days of medication, and also days of training, so that the eyes could be kept quiet while the manual was being perfected with the broad knife. The patient was put to bed before the operation was commenced, and every precaution was used to avoid motion of the body during the whole bed treatment. The eyes were kept carefully bandaged for days. With all of these precautions, failures were so frequent as to deter many blind persons from accepting the ordeal. If every other eye turned out well, the successful surgeon was satisfied with his work, and was congratulated by his colleagues.

What great changes have been brought about in my personal experience! From the satisfaction of not losing more than 50 per cent. of eyes under cataract extraction, some at the present day feel unhappy if they lose a single eye out of a hundred cases of simple senile cataract operation. All of this the improved technique of the operation has accomplished. The ideal cataract extraction seems nearly attained by the methods now adopted. Asepsis and antisepsis have largely brought this about. To have absolutely clean instruments, as well as sharp ones, is a very important integral part of the work. There was a time in my early experience when every cataract patient had to be especially prepared by days of medication and dieting before they were made fit, or as we now see it, before they were made unfit, to undergo the operation of extraction. The instruments used were considered in good order provided there were no rust spots upon them. Our present knowledge, that invisible pathogenic germs introduced into wounds by bright instruments excite destructive inflammation; also that active purgation is not the universal panacea for reëstablishing or maintaining health, has revolutionized the work of the ophthalmic surgeon. He now devotes more time to the purification of his instruments, his hands, and the eye to be operated upon, and less to the disturbance of the healthy natural condition of his patient. At the present time, most of my cataract extractions are made on the day that the patients present themselves for treatment. In hospital practice, they are sent from the free dispensary to the operating room, a warm bath in transit, for general cleansing purposes, being the only preparation made. My method of cleansing instruments is to plunge them into boiling water. I prefer this to soaking them in a carbolic or a boric acid solution. I find the boiling water the most speedy antiseptic or aseptic treat-

ment, without detriment to the cutting quality of the instruments. After the instillation of a 4 per cent. solution of cocaine for five minutes, I wash the eyeball with a stream of sublimate solution, 1-4,000, and attribute more benefit to the thorough cleansing of the conjunctival surface by water thrown from an irrigator than by the momentary action of the mercurial solution. I consider this more asepsis than antiseptis, and would place as much confidence in a stream of unmedicated water that had recently been sterilized by boiling.

A properly made wire speculum seems to me the ideal method of keeping the lids apart. The instrument should lie flat to the temple, and should make no pressure upon the eyeball. All eye specula by no means carry out these indications. Some use the speculum only to complete the corneal section. I prefer keeping it in place from the beginning to the end of the operation.

I also use the fixation forceps until the lens is extracted. I feel that the eye is safer by so doing. Some use the forceps only to aid in the corneal section, and trust to their control of the patient during the remaining and important steps of liberating the lens. This always seems to me a needless risk. With many patients the eye will involuntarily roll up suddenly at a most inopportune moment, when instruments are within the eye chamber. Unless extreme vigilance and great dexterity is used to anticipate these eye movements, serious injury to the eye will occur. As against this confidence in the patient's ability to keep the eye quiet, I find the judicious use of the fixation forceps a better guarantee against accident.

By nearly universal consent, the corneal wound is made under the upper lid, and is restricted to the clear cornea, although the puncture and counterpuncture are placed in the limbus, where the white sclerotic overlaps the clear cornea. This is done to give width to the opening. The long, narrow, sharp pointed and keen cutting knife of Graefe is in universal use. To do all that is expected of it requires the constant care of a good cutler. In making the section, most surgeons follow the corneal curvature in a line just within the clear corneal boundary. The varied size of the opening through which the lens is to escape without squeezing the angles of the corneal wound, is secured by approaching more or less to the horizontal meridian in the transfixion. This needs experience and judgment to determine in advance, in each case, the size of the lens to be extruded. In making the corneal section some cut with the point of the knife, and then with the heel—a sawing motion. Others complete the entire section by making the point follow the corneal curvature as the blade is pushed forward. These are peculiarities of the operator, and are non essential, provided the knife is

dextrously handled, and pressure is not made upon the iris by the blade of the knife in the to and fro movements of sawing. When an iridectomy is to be made, it is now generally agreed that the coloboma should be small. By seizing the iris near the pupillary border with the iris forceps, it is drawn vertically upwards. As soon as the pigmented pupillary edge is seen out of the corneal wound, this protruding portion of the iris is cut off by one snip of the scissors. This gives a comparatively small opening which will not be conspicuous, nor will it permit too much irregular refraction. The method of opening the capsule is still a mooted point. To tear off and take away the anterior surface of the capsule is undoubtedly the ideal method, as it does away with the secondary operations. With an iridectomy and a properly constructed forceps, this can be readily effected. When the iris is left intact, it requires nice manipulation to avoid including the iris in the blade of the forceps. In opening the capsule with the cystotome, much is said of the cutting properties of this diminutive blade, which seldom acts as a knife, but tears the capsule with its sharp point. Provided the rent is made large enough to let the lens out freely, it seems to matter little whether it be in triangular or in T shape. Either of these seems preferable to the horizontal cut over the upper edge of the lens, which leaves the anterior capsule to be disposed of by a secondary capsulotomy some weeks after the extraction. The delivery of the lens is made either by curette pressure on the cornea, or by finger pressure through the lids, the speculum being previously withdrawn. When the patient can be relied upon to direct his eye as the operator desires, no great difficulty presents for finger manipulation. I, with the majority of surgeons, prefer to retain the speculum until the pupil is cleared of all lens substance. I find that when the corneal wound has been made to correspond with the size of the lens to be extracted, the pressure of a shell spoon below the ciliary border tilts the upper edge of the lens forward as well as starts its movement upwards, and delivery is accomplished by following with the spoon the lens as it advances. In the majority of cases, by spoon manipulation on the cornea all lens substance can be removed, even when the iris is left intact. When the lens seems to stick to the inner face of the iris, I have found much benefit in making pressure with the fixation forceps above the corneal wound. Beside keeping the eye quiet, it helps to direct the upper edge of the lens through the corneal opening. To get out fragments of lens which are disposed to remain notwithstanding spoon pressure, I have sometimes used the curette, as is constantly done by Galezowski; or I have washed out the chamber, as is the constant practice of De Wecker. I do not find it necessary to use either of these methods habitu-

ally, as do those surgeons. I have found at times the forceps of great value in recovering fragments of thickened capsule. Recently, in one instance of capsule so thick that the effort of dividing it ruptured the suspensory ligament, I seized the capsule with forceps, and delivered the lens entire in capsule by traction. It was without iridectomy, and gave perfect final results. In another case, equally without iridectomy, with thick capsule which did not yield promptly to the cystotome, I drew out the entire capsule by forceps, and then by pressure removed the lens. There is no doubt but that a very important part of the ideal operation of cataract extraction is to leave the pupil clean of all lens detritus. This should be effected by patient, delicate manipulation, using curette, syringe or forceps, as the indication may demand. When iridectomy has been performed, it is important to have the angle of the corneal wound freed from the presence of any fold of iris, and the spud should be used to dislodge any portion of this membrane which may have been caught in the lips of the wound. When no iridectomy is done, in the majority of cases, after pupil cleansing, the iris resumes its normal position with round central pupil. Should the pupil be irregular, or the iris tend to prolapse, it should be replaced *in situ* by smoothing it out with the side of the spud, using gentle lateral pressure on the face of the iris in the anterior chamber to release any pinching of the iris by the angle of the corneal wound. If the iris be injured in the lens exit, or its tendency to prolapse shows itself, it would be better at once to convert the operation into one with iridectomy, rather than run the risk of an iritic hernia after the final dressing is made. The cleansing of the corneal wound of any blood clot, and the removal of all lens detritus from the conjunctiva, complete the operation. If no iridectomy has been practiced, a drop of an eserine solution, $\frac{1}{2}$ per cent. strength, is placed upon the cornea, otherwise the eye is ready for the permanent dressing. With the closing of the lids after a careful operation, at least nine-tenths of the dangers against a successful result have been already successfully met. In my professional experience it matters little how the eye is dressed, provided the upper lid be kept for a few days over the corneal wound, for its uniform support whilst healing, and provided no irregular pressure be made upon the cut eyeball by badly adjusted compresses, or by too tightly tied bandages. Experience has led me to adopt the lightest of dressing, and the avoidance of dark rooms. I feel also quite assured that we have all erred in inflicting too much bodily restraint, to the annoyance of our patients. To be sure, we get finally good eyes after carefully performed operations, when we keep patients in bed, on their backs in dark rooms; but we equally get good results in like proportion after carefully per-

formed operations, when we do not treat them as bed patients. It is more the careful technique, and not so much the after-treatment, that increases the percentage of cures. I am glad to say that I see a general relaxation from the rigid rules for dark rooms and bed confinement in such universal use a few years back. I am sure that this rational change is for the good of both surgeon and patient.

The ideal extraction of simple senile cataract is undoubtedly without iridectomy, making a flap opening in the upper segment of the clear cornea, destroying, or better, removing the anterior face of the capsule, and getting rid of all lens detritus from the pupil. The operation of extraction without iridectomy is evidently growing in favor. With myself it is decidedly so, as shown by my annual hospital reports. The report of work done at the Presbyterian Eye, Ear and Throat Hospital of Baltimore City for 1887, gives 83 cataract extractions, all with iridectomy. For 1888, 97 extractions of senile cataract, of which 40 were done with iridectomy and 57 without. For the year 1889, of 93 extractions, 33 were with iridectomy and 60 were without. For last year, 1890, of 113 extractions, 93 were without iridectomy, and only 20 with iridectomy. Unless especially contraindicated, all simple senile cataracts are extracted by me without iridectomy. When accidents occur to the iris during the corneal section, or during the escape of the lens, it may be proper to excise a portion. In some cases, when the iris is replaced after the lens has been extracted, it shows a tendency to prolapse, notwithstanding the instillation of eserine. Should such be noted, it is better to remove the protruding portion of iris, and in this way avoid the accidents of iritic hernia during the after-treatment.

PRESSURE ON THE GLOBE AFTER CATARACT EXTRACTION.

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What is to be said under this head will also apply to all operations involving the section of the cornea or sclero-corneal junction; but is of greatest importance with reference to cataract extraction since it involves the most extensive of these sections.

In the normal eye the contents of the sclero-corneal coat press outward at every point with a force represented by a column of mercury about thirty millimetres in height; and the sclero-corneal coat at every point successfully withstands this pressure, by its own continuity and firm