

the former must not be carried too far, for although previous iritis has a particularly prejudicial effect, many eyes, with conjunctivitis or trachoma, can be safely operated upon after preliminary antiseptic and astringent treatment for days or weeks. (3) The omission of iridectomy, while producing excellent results in the majority of cases, does nevertheless increase the risk of prolapse of the iris, occlusion and glaucoma. On the other hand, it diminishes the danger of vitreous loss. (4) Extraction of the lens in its capsule increases the risk of vitreous loss and necessitates a larger incision, with *a priori* greater danger of impairment of corneal nutrition and sloughing. (5) The presence of posterior capsule is a less evil. It is often transparent and, if not, can be easily needled. (6) Therefore, as a general rule, Von Graefe's linear extraction with iridectomy is the most suitable and gives the best average immediate and subsequent results.

SOME PRACTICAL POINTS IN CATARACT EXTRACTION.

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THE writer's experience in **cataract extraction** extends over a period of twelve years. His total extractions number 495, of which 266 were done during the year 1900. The number of operations is small compared with the experience of many surgeons in India; still the number is sufficiently large to afford, if carefully studied, some valuable instruction as to the operation itself in general, and as to some of the more important details in particular.

The necessity of rigidly observing every minute detail of the operation becomes increasingly apparent as one is able to extend his experience on this line of work so common to most in every part of India. What the writer has to offer on "practical points" is the result of carefully kept notes and study of his cases.

1. *The preparation of the patient.*—Of necessity most cataract patients are operated on in Indian hospitals on the day of, or the day following, admission. At least this is true in the mofussil. Fortunately in the country few cataractous eyes require treatment preliminary to operation, provided the cataracts are sufficiently mature. It should go without saying that eyes in which a chronic discharge, congestion, ulceration, entropion exists suitable preliminary treatment should be employed before operation for removal of cataract is undertaken. For chronic hyperæmias of both conjunctiva and cornea accompanied by a discharge probably nothing will be found more serviceable in the preparation of the patient

than a two to four per cent. solution of protargol instilled into the eye three or four times a day, accompanied by a moist dressing of bichloride of mercury 1 in 2000 to 4000. Pterygium if small may be left alone; if extending more than four lines over the cornea it should be previously removed. When removal is undertaken, the wound should be allowed to thoroughly cicatrize before the larger operation is attempted.

The preliminary use of a mydriatic in clean eyes, except the instillation of a single drop of a two-grain solution for the purpose of examination of the lens, we have not found necessary

Given a clean eye with active pupil, and normal tension and light perception, there is no reason why the patient may not be operated on immediately after admission, provided, of course, the patient is clean and has clean clothing and bedding. The majority of our patients in the Miraj Hospital are operated on during the day of admission, and we have no reason to regret the practice. Before the patient goes on the table his face should have been thoroughly washed with soap and water followed by a wash of bichloride of mercury 1 in 2,000. The patient having been put on the table, facing if possible a good north light, and the surgeon and his assistant having sterilized their hands as for any major operation, the patient's face is further cleansed by the surgeon or his assistant by the use of pledgets of cotton taken from a 1 in 1000 bichloride solution.

2. *Sterilization of instruments.*—Nothing is so efficient as boiling. All instruments with the exception of knives and bone-handled instruments should be boiled in a 5 per cent. carbonate of soda solution for ten minutes, knives and bone or ivory-handled instruments are best sterilized by placing them for eight minutes in strong carbolic acid. The instruments may be taken from the boiler and carbolic acid with sterile forceps, placed in 5 per cent. warm carbolic solution from which they are taken by sterile hands, wiped dry and placed in a previously sterilized porcelain tray ready for use.

A sharp knife is a *sine qua non* if a clean wound is to be made. As a rule, a knife should not be used to make more than two incisions without re-sharpening. An Arkansas oil-stone is the best hone. The writer always sharpens his own knives immediately before sterilizing his hands.

3. *Anæsthesia.*—Chloroform is used only in the needling of congenital cataracts in children, and in extremely nervous adults. To cocaineize, the plan we have found to give uniformly the best results, is the use of a 4 per cent. solution of cocaine freshly prepared and dropped into the eye every 4 minutes by the watch until 4 drops have been used. The cocaine should be allowed to fall directly over the upper half of the cornea and a single drop at a time. We have not found it necessary to sterilize the cocaine solution by boiling. By the use of five drops of a 5 per cent. solution of carbolic acid added to half an ounce of the cocaine solution, it may be kept for two weeks without appreciable deterioration. Of course, the glass stoppered bottle containing the cocaine solution should have been previously sterilized by boiling.

4. *Sterilization of the conjunctival sac.*—Two minutes after the instillation of the fourth drop of

cocaine the speculum is introduced and partly opened. The most satisfactory speculum is a simple one with a strong spring and simple hook or screw device for controlling the expansion. It should have a sufficient bend to keep its extremity clear of knife and should be easy to grasp. The writer has known serious injury result from the slipping of the speculum on a surgeon's hand. He has also known a patient to screw up his lids and shoot out the speculum where the instrument was not sufficiently firm in the blades. Having introduced the speculum, the eye should now be slowly irrigated with 1 in 4000 bichloride solution from a small rubber syringe kept in the solution and used solely for this purpose. Following this the conjunctival sac should be further irrigated with half a pint of a saturated boric acid solution. This is best done by a nurse or student from a glass fountain irrigator having a clamp to control the current and placed about two feet above the patient's head, a glass nozzle being used.

The surgeon meanwhile mops the inner canthus with a small cotton sponge and removes any shreds of mucus which may adhere to the speculum or lids. Frequently it is necessary to remove the speculum to accomplish this as the shreds sometimes adhere beneath the blade of the instrument. The stream of water should be made to play well beneath the upper lid and over the inner canthus.

5. *The incision.*—This we find is best made with the speculum *in situ*. In subsequent steps a lid retractor replaces the speculum and is held by an assistant who, with the thumb of the other hand, draws down the lower lid. As to the kind of incision, we find it does not make any very particular difference which incision is employed provided it is free enough. On the whole, however, we prefer the flap incision made with a Graefe knife in the sclero-corneal limbus immediately in front of the vascular zone cutting straight up in this line and ending with a backward movement when the conjunctiva is reached sufficient to secure a conjunctival flap of about two lines in width. The bleeding from a conjunctival flap of this size is practically nil. Even if there is some bleeding from the conjunctiva, it is quickly checked by gentle compression from a moist boric sponge. In most cases it quickly stops spontaneously.

The advantage of the conjunctival flap is that it secures prompt adhesion of the wound, thus preventing infection and prolapse of iris. Astigmatism too, we believe, is less after this incision than when the incision is used which begins and ends in the cornea. In making the incision the conjunctiva is widely grasped with the fixation forceps a little to the outer side of the median line of the eyeball. The puncture is made in the limbus one line above the horizontal meridian and the counter-puncture at the same opposite point. If a pterygium exists (occasionally one is obliged to be operated when it does) the puncture is made a line or more below the horizontal meridian and the counter-puncture several lines above it on the opposite side according to the size of the pterygium.

6. *The removal of the lens.*—There can be no doubt but that the removal of the lens in its capsule without an iridectomy is the

ideal operation. However, since this operation is one which requires more patience and delicate manipulation in its performance, we believe that until one has had considerable experience with the older operation of iridectomy and capsulotomy, he had better not make this operation the one of election. Our experience with the former operation is that healing is generally more smooth and the visual result on the whole better than when an iridectomy is done and the capsule ruptured. An accident sometimes occurs in the performance of this operation which I have not seen mentioned elsewhere, and that is the rupture of the capsule when the lens is about to escape through or is all but through the wound.

It may occur even when a liberal incision has been made and when the lens has not been directly touched by an instrument. It occurs generally in what G. Hall calls "semi fluid" cataracts.

Fortunately, however, it is usually an easy matter to grasp the remaining capsule with an iris forceps and deliver it together with the pieces of cortex which sometimes remain also. If vitreous escapes when this accident occurs and one is obliged to leave the capsule and pieces of cortex, iritis is likely to ensue, though good vision may in the end be secured. In this or similar accidents, in cataract extraction, too much manipulation in order to correct matters is to be greatly deprecated as resulting in much more harm than good. If the capsule is not readily caught with the first or second introduction of the iris forceps an iridectomy should be done and the rest left to nature.

If, owing to the small size of the cornea or for other reason the incision is small, we think it best to do a preliminary iridectomy; and if undue pressure is required to start the lens from its position, the capsule should be pricked and the cataract removed by the older method. Enlarging of the incision after it has been made, is very unsatisfactory and ought always to be avoided, if possible.

The most suitable cataracts for this operation, as it seems to us, are the morgagnian, hard, and hypermature cataracts, though we now generally employ it for all except soft cataracts which we remove through a small linear incision at one sitting by irrigation and suction. Congenital cataracts are needed. If circumstances demand it, we do not hesitate to remove immature cataracts. The attempt to hasten the ripening of immature cataracts is likely to result in more harm than the removal of the lens in its capsule.

With regard to the loss of vitreous.—We believe with Henry Smith, of Jullundur, that when the lens is removed in its capsule, the loss of a few drops is of no consequence. We have found too that the voluntary loss of a drop or two of vitreous is often in itself a good thing in that it permits the bulging iris to recede and contract. The loss of vitreous with retained cortex and

capsule is, however, a very different matter, and is likely to lead to inferior healing.

We have found that when there is a tendency to prolapse of the iris, a fine stream of boric lotion directed from the fine metal nozzle of a small rubber spring upon the cut surface of the wound will invariably cause the prompt contraction of the iris.

7. *The question of mydriatics and myotics in cataract extraction.*—We believe the instillation of a single drop of a half per cent solution of atropine a few hours before the operation for the purpose of more accurately determining the nature of the cataract and the degree of ripeness to be good practice.

If an iridectomy has been done, we also believe it good practice to instil a one per cent. solution of atropine before the dressing is applied. If simple extraction has been performed, we think the instillation of a drop of a half per cent. solution of eserine helps to keep the pupil contracted thus preventing its incarceration in the wound.

8. *The dressing and subsequent treatment.*—After using various dressings the one we prefer is a sterilized absorbent cotton compress between two layers of lint and smeared with white boric ointment on which a little iodoform has been dusted. The compress is held in place by a roller gauze bandage. The ointment prevents agglutination of the lids and the consequent accumulation of tears within them. This dressing is removed in twenty-four hours, the lower lid drawn down, and the conjunctiva irrigated with boric lotion without disturbing the upper lid, the same dressing is reapplied for two days, after which a dry sterile compress is used for

four or five days longer when an eye-shade replaces the compress.

Both eyes are always bandaged after operation.

9. *The removal of both lenses at one sitting in case of double cataracts.*—If both cataracts are mature and the eyes free of discharge and inflammation, we do not hesitate to remove both lenses at one sitting. We have done this for several years and have no occasion to regret the practice. For a beginner, however, we do not recommend the simultaneous removal of both cataracts.

10. *Nervous phenomena.*—Occasionally one finds that an eye operation, especially cataract extraction, results in profound nervous excitement, amounting at times to temporary dementia. A few years ago a patient upon whom we had operated, removing both lenses and in which there was practically no reaction, on the fourth day became very restless, and before the gravity of his trouble was realized, jumped from a second storey window of the hospital destroying his life. Some months ago another patient, a woman, ordinarily of quiet disposition who had had a cataract removed on the evening of the operation, became violent and abusive, but was promptly quieted by a full dose of chloral and after which no further excitement occurred. In the *Philadelphia Medical Journal*, September 15th, 1900, a number of cases of this kind are reported. About all the treatment that seems necessary is the free use of cerebral sedatives until the symptoms subside which they usually do in a few hours.

OPHTHALMIC NOTES FROM MOZUFFERPUR.

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Total No. of operations.	Cured.	Percentage of success.	SEX.		CASTE.		AGE.			
			Male.	Female.	Mahomedan.	Hindu.	Below 20 years.	20 and under 40.	40 & under 60 years.	60 years & upwards.
425	312	71.06	301	124		328	...	68	278	79

Senile Cataract.—The usual form of cataract is the so-called "Senile." Many cases present themselves with mixed senile and secondary cataracts, the cataract developing secondary to disease of the vitreous and glaucoma. The glaucoma is most frequently due to the cataract in the patient's other eye having been "**couched**" by some native quack. Some of these secondary cataracts, where there is good perception of light, are operated on, and a proportion get good vision, but the percentage of successful results in removing cataract is decreased by operating in these cases. This "**couching**" for cataract is unfortunately very common in the

district, and the number of eyes made hopelessly blind thereby is terribly large.

I never go to an out-dispensary to operate on cataract patients, but that at least half the applicants for treatment have had their eyes couched for cataract. The eyes seen are in every stage of secondary glaucoma, from general panophthalmia to eyes of stony hardness and with no perception of light, to phthisis bulbi and complete wasting of the eye. It may be said that villagers would not allow couchers to operate on their eyes if the operation for cataract in the hospitals of the district was in repute and popular. This is not so, for the