ON TRAUMATIC CATARACT: WITH RESULTS OF SIXTY OPERATIONS.

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[Concluded from page 67 of number for Jan. 20th.]

Operative Methods.—Amidst the variety of views which prevail in regard to the operation for senile cataract, one thing is clearly made out, that many cases which were formerly considered as incurable are now no longer regarded as such. This satisfactory result has been obtained by our improved operative methods. But, whatever may be the ultimate position of the old flap-operation in senile cataract, it is certain that in very rare exceptional cases only can it be applicable to traumatic cataract.

Indeed, so long as the old method was the only one in vogue, most injured eyes were left alone, for an eye which has just received a severe injury is unfit to sustain the additional shock of a flap-operation. In order that an eye should recover sight after the removal of the lens by a large flap, it is necessary that the tissues be in a healthy condition. Now, in an eye which has just met with an injury causing traumatic cataract, the lens has either been simply rendered opaque, but is still adherent to its capsule, in which case a large incision will not admit of its entire removal; or it has been partially broken up, when the fragments will come away and the rest will remain causing violent inflammation; or the iris and ciliary circle have already been pressed upon for some days by the dislocated lens, and are, therefore, not in a condition to resist the inflammatory process caused by a large flap, but, on the contrary, will take part in that process, leading towards atrophy of the organ, softening, etc. Besides, in cases of traumatic cataract with a tendency to adhesion, a large incision and pressure, however gently made, is more likely to cause prolapse of the vitreous body than of the lens. Great loss of vitreous humour is also likely to be caused by the tension of the eyeball and derangement of parts; and thus the object of the operation is defeated and the eye destroyed. On the other hand, when the lens is broken into fragments, these may be all readily removed through a small incision. In short, the large flap is either unnecessary or ineffective.

The operations which I have adopted are the following.

1. *Linear Extraction, with the Lance shaped Knife.*—This is applicable to cases of young and middle-aged persons, who form the largest class subject to traumatic cataract.

2. *The Author's method with the Corneo-Conjunctival Flap (An Improved Method of Extraction of Cataract, with results of 107 Operations. Churchill: 1868).* I have employed it only in treating patients above the age of 50. It rendered me essential service in cases complicated with partial opacity of the cornea, like Case II already detailed; no other method would have answered so well.

3. *Linear Extraction through the Cornea with Von Graefe's Knife* is in some cases much to be preferred to every other method.*

These operations I have employed according to the following plan.

1. When the lens is totally dislocated or broken into fragments, I remove it by the lance-shaped knife.

2. When the whole lens cannot be removed, I take out only the broken fragments, perform iridectomy, and leave the rest, which, if not removed by the action of the aqueous humour, may be dealt with subsequently; but in no case would I use a curette or any traction instruments to remove lenticular debris.

3. When the capsule is but slightly torn, I open it freely with a needle, so as to bring the whole lens under the action of the aqueous humour, and then I remove it subsequently.

4. When the iris has been lacerated, I remove the injured portion, and leave the lens, if not dislocated, to be dealt with at a future period.

5. In patients above the age of 50, where the lens is not broken up, I make an iridectomy, and extract the lens by the small flap at the same time, when urgent, or else at a subsequent period. In short, the principle upon which I act is, not to do too much at a time, but to proceed cautiously and safely as far as the recuperative powers of the organ will admit.

Fig. 1 represents the method of linear extraction with the lance-shaped knife. The patient being under chloroform and the eyelids held open by a speculum, I seize the conjunctiva and the subconjunctival tissues with the forceps, either in the upper or the lower vertical meri-

dian, at a distance of about the sixth of an inch from the corneo-sclerotic junction; I then introduce the lance through the cornea into the anterior chamber and behind the lens, pushing the iris out of the way; the aqueous humour escapes, and the lens advances forwards, which is thus pumped out by graduated pressure with the forceps and depression of the lance. If the incision be found insufficient, I enlarge it on each

Fig 1

side, and direct the point of the lance towards the debris of the lens which may have remained behind. The small wound made by this operation heals generally within four or six hours, and can never do any harm; on the contrary, even if it do not produce all the results desired, it serves the purpose of a large paracentesis in lessening the tension by allowing the escape of the fluid.

The following case will show the advantage of relieving tension in this manner in other injuries besides those above referred to.

Sir —, of advanced age, who had lost the right eye by an operation for cataract some time ago, came to me for an operation on the left eye, which was also affected with senile cataract. This being his last chance of recovering vision, I made a preparatory iridectomy, which did well, the only peculiarity being that the cornea collapsed during the operation. Three weeks later, I removed the lens by a small flap-operation. After forty-eight hours, the eye was opened, when the sight was found good and the aqueous chamber clear. On the third day, the corneal wound was completely healed, and he was allowed to go to the next room. On the sixth day, I found that the patient had passed a restless night. On the previous day he had accidentally struck his eye with the point of the thumb. He felt pain at the time, but in half an hour it passed away, and he thought no more of it. In the evening, however, the pain returned; and, on examination, I found the cicatrix looking tender and puffy in the middle, but the media still clear. On the seventh day, the cicatrix was rather more puffy, the aqueous humour clouded, the iris slightly chagrined. On the eighth day, when in the act of sneezing, he felt something give way, which was followed by immediate relief. The centre of the cicatrix had, in fact, burst, allowing the escape of the aqueous humour. On the ninth day, the pain having returned, paracentesis was performed, giving immediate relief. From this time the eye began to mend, and ultimately recovered; the only inconvenience being that the pupil became adherent to the cicatrix. This was remedied by an artificial pupil, and ultimately fair sight was obtained. There can be no doubt that this case was saved by paracentesis. It appears, therefore, evident that an eye which has just sustained an injury, although it cannot resist the shock nor repair the wound of a large operation, can yet be

* Whether Von Graefe's operation will continue to occupy that high place which it now holds in the estimation of some of our eminent operators, time will show; yet there can be but one opinion as to the value of his cataract-knife.

benefited by a small operation which draws off some of the aqueous humour, containing, as it does frequently in such cases, fragments of floating lenticular substance, and occasionally pus. This operation may with safety, even with benefit, be repeated, if necessary, several times at intervals. I need hardly say that idiosyncracies and previous histories of the patients must be taken into account; that every case must be treated *per se*, and not be judged upon a fixed rule; and that complications must be separately dealt with.

Fig. 2 represents the author's method in the first stage of the operation. It shows the size of the corneo-conjunctival flap, and at a

Fig. 2.

glance will be seen the advantage which we derive from that section in cases of partial opacity of the cornea, when it is our object not to encroach upon any transparent portion.

Dislocation of the Lens into the Vitreous Humour.—This accident generally does not call for immediate operative interference. At present, I have two cases under observation, one of six and the other of fifteen months' standing; in the one the lens is quite transparent, and does not cause any inflammatory symptoms, and in the other the lens is almost opaque and will soon require extraction. But since my last paper was written, the following accident was brought to me for treatment.

CASE X.—A. C., aged 21, rivetter, was struck with a stone on his left eye. On presenting himself at the Ophthalmic Institution on the 4th December, 1871, two days after the accident had occurred, the eye was free of inflammation; the pupil was widely dilated; the zonula ruptured, and the lens within its capsule and pigmentous ring round its border, floating in all directions, following the movements of the eyeball. Knowing the difficulties which beset the extraction of the lens under such conditions, I recommended to have the eye shaded for a few days, and to abstain for the present from all treatment. On the 14th December, the patient returned with violent glaucomatous symptoms: pain in the eyeball and temple excessive, whence it extended to the whole side of the head and ear in such a manner as I have rarely met with in ordinary glaucomatous cases. Ophthalmoscopic examination showed the lens beginning to exhibit opaque striæ. Under these circumstances I admitted him into the house; and on the 15th I operated in the following manner. 1. The patient was seated upon a chair with his head bent slightly forward, supported by an assistant; whilst I, sitting in front of him upon a lower chair, used the fingers of my left hand as a speculum to keep open the eyelids, and with the right

I introduced a needle through the sclerotic behind the lens, which I brought forward into the anterior chamber. I then handed over the needle, which fixed the lens in that position, to another assistant, and made the patient recline his head backwards, still leaning upon the assistant. 2. I now introduced the lance through the cornea behind the lens, part of which presented itself at once through the wound, and another portion slipped and then became fixed in the outer angle, covering the fourth part of the cornea. The patient was at once relieved of his pain, passed a quiet night, and on the tenth day was dismissed with good sight.

Old Accidents.—As traumatic cataract of old standing does not differ from idiopathic cataract, I therefore treat it upon general principles; viz., in simple lenticular opacity, in young and middle-aged subjects, I open the capsule or break up the lens with a needle (according to its consistency) and then extract it, about five or ten days later, by a linear incision, generally not interfering with the integrity of the pupil. In persons above the age of fifty, I extract it in the ordinary way. I may illustrate it by the following case, which from its many complications is best calculated to convey my meaning, although it does not belong to the class of cases of which I am treating.

CASE XI.—Mrs. G., aged 54, had lost the sight of her right eye completely by small-pox some years ago. The left eye (as represented in Fig. 3), although vision was not gone, was affected with staphyloma;

Fig. 3.

nearly one-half of the cornea was opaque; the iris was adherent in the corneal cicatrix, and not dilatable. Recently this eye became affected with cataract, but without absolutely complete loss of vision. It was one of those cataracts which come slowly to maturity. I first performed iridectomy, and a fortnight later I opened the capsule with a needle without disturbing the lens, and at the same time breaking up old adhesions. Three weeks later, I extracted the lens by a small corneo-conjunctival flap; the result was good sight.

The value of the conjunctival flap in this case is apparent, as it will be seen from the drawing, taken after the removal of the lens, that opaque lines are radiating from the cicatrix; hence the desirableness to save the transparent cornea.

CASE XII. *Traumatic Cataract, with posterior adhesion of seven years' standing: Iridectomy and Extraction. Cure: Good Sight.*—J. L., aged 15, message-boy, was brought as an out-patient to the Glasgow Ophthalmic Institution in October 1871, for an extensive ulceration of the cornea of the left eye. There were spasm of the orbiculares, photophobia, lachrymation, and sneezing; so that minute examination of either eye was impossible. With regard to his right eye, his mother informed us that it was destroyed seven years ago by a piece of clay thrown from a sling. The accident was under the care of an oculist at the time, who declared it a hopeless case, and all interference unsafe. After the ulceration of the left eye began to cicatrize and the symptoms abated, I examined the right eye, which I found to be affected with traumatic cataract and posterior adhesions. The pupil was small, irregular, and distorted towards the inner angle, and so much stretched upon the capsule of the lens, and the anterior chamber deepened, that it had the appearance

of cornea pellucida. He was admitted as an in-door patient to the institution on November 11th, when I broke up some of the adhesions with a needle, and next day I made a large iridectomy and extracted the lens. On November 14th, he had good sight; and on the 18th, he was dismissed cured. The left eye is still improving; but, owing to its extensive opacity, he will depend almost exclusively upon his right eye, which was considered hopeless.

List of Cases.

No.	Name and age.	Occupation.	Complications.	Sight.
1	R. W., 58	Labourer.	Anterior adhesion.	Good.
2	J. M., 5	School.	Anterior adhesion.	Good.
3	J. D., 10	School.		Good.
4	W. D., 39	Hammerman.	Posterior adhesion.	Good.
5	R. S., 19	Engineer.	Laceration of cornea.	Medium.
6	F. R., 27	Cabinet-maker.	Iron in lens.	Good.
7	J. B., 19	Smith.		Good. Subsequent atrophy.
8	A. F., 12	Message-boy.		Good.
9	R. M'L., 18	Rivetter.	Posterior synechia.	Good.
10	B. M., 21	Caulker.	Steel in lens.	Good.
11	G. H., 41	Boiler-maker.	Posterior adhesion.	Good.
12	S. O., 61	Chandelier polisher.	Corneal opacity. Iron in lens.	Good.
13	T. H., 34	Engine-fitter.	Lacerated iris.	Good.
14	G. C., 110	Engineer.		Good.
15	A. N., 30	Engine-keeper.	Dislocation of lens, etc.	Good.
16	R. M'A., 18	Boiler-maker.	Lacerated iris and ciliary process.	None.
17	J. J., 31	Granite polisher.	Quartz in lens.	Good.
18	T. H.	Rivetter.	Steel in lens.	Good.
19	J. C., 34	Miller.		Good.
20	D. S., 21	Boiler-maker.	Laceration of iris.	Good.
21	W. B., 19	Cloak-maker.	Lacerated cornea & iris.	None.
22	W. S., 14	Iron-dresser.		Good.
23	A. M'C., 30	Bolt-maker.		None.
24	J. M., 38	Rivetter.		Good.
25	N. M'G., 14	School.		Medium.
26	W. G., 17		Dislocation of lens.	Medium.
27	D. M'T., 34	Boiler-maker.		Good.
28	G. P., 27	Rivetter.		None.
29	J. S., 21	Boiler-maker.		Good.
30	J. C., 28	Mechanic.		Good.
31	J. B., 42	Engine-fitter.	Posterior synechia.	Medium.
32	F. H., 9	School.		Good.
33	J. C., 9	School.		Good.
34	T. U., 9	Engineer.		Medium.
35	F. L., 14	Sewing-girl.	Posterior adhesion.	Good.
36	M. S., 19	Iron-dresser.		Medium.
37	P. M., 22	Labourer.		Good.
38	E. L., 20	Boiler-maker.	Foreign body in lens. Hypopion, etc.	Good.
39	J. K., 25	Engine-fitter.		Good.
40	J. S., 19	Labourer.		Good.
41	J. S., 34	Boiler-maker.	Contortion of eye.	Medium.
42	A. Y., 25	Mechanic.		Result not ascertained.
43	R. K., 27	Engine-fitter.		Good.
44	T. M., 13	Message-boy.		Good.
45	R. C., 15	Rivetter.	Strabismus.	Good.
46	T. M., 21	Servant.		Good.
47	G. B., 8	School.		Good.
48	M. J., 17	Sewing-girl.	Anterior adhesion.	Good.
49	T. M., 19	Rivetter.	Laceration of iris.	Good.
50	N. M'G., 18	Labourer.	Laceration of iris.	Good.
51	A. S., 8	Message-boy.	Lacerated lens by thorn.	Good.
52	R. W., 22	Boiler-maker.	Steel in lens.	Good.
53	T. W., 36	Engineer.	Laceration of cornea and iris.	Medium.
54	D. M'F., 35	Boiler-maker.		None.
55	D. W., 52	Granary-keeper.	Posterior adhesion.	Good.
56	M. S., 19	Iron-dresser.		Good.
57	J. M'K., 29	Rivetter.	Lacerated iris.	Good.
58	N. C., 21	Rivetter.	Dislocation into vitreous.	Good.
59	P. G., 38	Miner.	Posterior adhesion.	Good.
60	E. C., 28	Caulker.		Good.

CLINICAL MEMORANDA.

VACCINATION BY VESICATION.

THE following method will be found more generally applicable than any I have seen described, as it requires but one interview with the patient; and while it is almost equally as expeditious as the use of the lancet, is much more certain. Fill the hollow cylinder of an ordinary sized key nearly, but not quite, full of dry cotton-wool well pressed in; dip a small piece of wool into strong liquor ammoniac, and place it on the dry wool, so as just to fill the cylinder; then hold it firmly on the part to be vaccinated, so that the wool dipped in the liquor ammoniac is kept in contact with the skin. In from one to two minutes, the cuticle will be found pale and wrinkled, and can be easily rubbed off by friction with a towel. The vaccine matter is then applied to the abraded surface.

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HYPERTROPHY AND DILATATION OF THE HEART.

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THOUGH hypertrophy of the heart has been recently allowed to be, in almost every case, a compensatory change and not a disease *per se*, we are not yet acquainted with the steps by which this change is inaugurated. That it is a result of some impression on the cardiac ganglia, and a trophic process set on foot, seems somewhat more than probable. Still, in other organs, we find involuntary muscular fibre with a power of self-increase in bulk, but we do not find the same accumulation of nerves as in the heart. Under these circumstances, then, we must feel that the mode by which cardiac hypertrophy is inaugurated is somewhat obscure. As some name must be used to cover what we do not know, it may be called a trophic action of the cardiac ganglia. When we come to the questions of under what circumstances this hypertrophy is produced, the ground is much clearer. We find hypertrophy of the heart-walls under three different sets of circumstances: (1) when an obstruction is offered to the flow of blood; (2) when the heart is subjected to distension under unusual pressure; (3) when its action is impeded, as in displacement, pericardial adhesion, etc.

1. With the first we are as yet most familiar: and it is under these circumstances that we find hypertrophy of the purest kind—that is, without dilatation. Thus in aortic obstruction, when free from regurgitation, we find pure and simple hypertrophy. A gradual obstruction is opposed to the complete and perfect contraction of the left ventricle, and hypertrophy grows up and meets and overcomes this resistance. So, too, in Bright's disease, where we have, according to Dr. George Johnson, hypertrophy of the muscular tunic of the arterioles, we have an obstruction offered to the flow of blood, and changes, usually hypertrophy, inaugurated in the left ventricle. But when the obstruction offered is of a more rapid nature, we find dilatation occurring, to a greater or less extent, in accordance with the rapidity of the formation of the obstruction, the extent to which the obstruction attains, and the heart's power to meet the obstruction; this last depending very greatly upon the general nutrition. But this dilatation is soon accompanied by hypertrophy; except in cases of intense general debility, or defective coronary circulation. This brings us to the second division, where there is also distension of the heart under unusual pressure.

2. Though hypertrophy of the heart is associated usually with the idea of obstruction in the blood-stream, still we find it in its maximum intensity in aortic regurgitation, and that, too, when most free from admixture of obstruction. For the same obstruction would also offer an impediment to the backward rush of blood from the aorta. We find hypertrophy combined with dilatation in the left ventricle in mitral regurgitation. We find too, according to Niemeyer, hypertrophy growing around dilatation when the heart-wall has yielded, owing to its softened condition, after pericarditis. In all the conditions we have hypertrophy produced without any obstruction to the blood-stream—*i.e.*, the condition of hypertrophy is found under these circumstances, whether any obstruction be found combined with them or not. These conditions themselves cause hypertrophy. Now, on what condition does this hypertrophy essentially depend? There is one condition common to all these instances, and the hypertrophy is found to its greatest extent where this cause is in strongest action. The condition is that of distension under increased pressure, and is found most marked in aortic regurgitation, where the ventricle is filled by blood coming in from the aortic recoil, as well as from the pulmonic veins through the mitral orifice. Here the muscular chamber in diastole is distended by the elastic recoil of the greater as well as the lesser circulation. Under this extreme distension, then, we find extreme hypertrophy. We also find hypertrophy and dilatation when the left ventricle is filled under unwonted pressure from a gorged pulmonic circulation alone—*i.e.*, in mitral regurgitation. Here so much blood is driven backwards through the mitral valve at every systole. The pulmonic vessels are already full of blood forced into them by an hypertrophied right ventricle; to this is added the amount of blood passing backwards through the insufficient mitral valve. Thus the pulmonic system is gorged and forces blood, in diastole, through the mitral valve under increased pressure. This is increased by the energy with which the dilated and hypertrophied auricle completes the ventricular distension by its contraction. Under these circumstances, we find that we have hypertrophy and dilatation of the left ventricle; first, dilatation inevitably the result of distension under increased pressure; and hypertrophy setting in to resist the over-distension. This is all clear enough, and presents no great difficulties. The chamber is filled under undue pressure in both the above cases, and hypertrophy sets in until the heart-wall is again equal to the increased