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Contributors

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64

OBSERVATIONS

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EXTRACTION AND DISPLACEMENT

OF THE

CATARACT,

WITH TABLES SHOWING THE RELATIVE SUCCESS
RESULTING FROM THE PERFORMANCE
OF THESE OPERATIONS.

By J. ARGYLL ROBERTSON, M. D. F. R. S. E.,

SURGEON TO THE EYE DISPENSARY OF EDINBURGH,

LECTURER ON SURGERY, &c.

(Read before the Medico-Chirurgical Society of Edinburgh,
6th January 1836.)

(From the *Edin. Med. and Surg. Journal*, No. 131.)

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THERE are three distinct modes of operation by which cataract may be cured.

1st, By *Division*, or the breaking down of the opaque lens, so that it may be acted upon by the aqueous humour, dissolved, and by absorption removed from the eye.

2d, By *Extraction*, or the complete removal of the opaque lens from the eye, through an incision made in the cornea.

3d, By *Displacement*, or the removal of the opaque lens from the axis of vision, but still leaving it within the eye.

It is almost universally admitted, that when the cataract is of soft consistence, so that it may be broken with facility into fragments, or so fluid that it may be diffused through the aqueous humour, the operation of *Division* should be resorted to, as inflicting comparatively little injury on the organ, and effecting a perfect and permanent cure, the lens being just as completely removed as it could be by the operation of *Extraction*, and at infinitely less risk.

It is also generally admitted that, in numerous cases of hard cataract, the operation of *extraction* cannot be resorted to, and other operations must be adopted for its removal from the axis of vision, as in the following circumstances, viz.

1. When the section of the cornea could not be completed without wounding the iris, in consequence of the cornea being unnaturally flat, the iris unusually convex, or when adhesions exist between the iris and cornea.

2. When there exists a diseased condition of the cornea, that would be likely to interfere with the speedy closure of the incision, or would render that part peculiarly liable to inflammation if wounded.

3. When adhesions exist between the margin of iris and capsule of the lens, preventing the free dilatation of the pupil, or when the pupil is small and not dilatable to such an extent as would admit freely of the passage of the lens, whether this condition of the iris arise from natural conformation, or from its component fibres having been agglutinated and rendered immoveable by the interstitial deposition of lymph.

4. When there is what is commonly termed "a fluid or disorganized condition of the vitreous humour;" that is, when the cells of the hyaloid membrane no longer exist. In such a case, were an incision made in the cornea of sufficient size to admit of the passage of the lens, through the same incision the whole of the vitreous humour would escape, and the eye sink in the socket. Such an accident I have witnessed in the hands of a skilful operator conversant with diseases of the eye.* It is also evident, that when the vitreous humour is in a fluid state, and an incision made in the cornea, that the slightest contraction of the muscles of the eye or eyelids would cause its escape.

5. When there is eversion or inversion of the ciliæ or palpebræ, either of which conditions would interfere with the closures of the wound in the cornea.

6. When the patient is extremely nervous, irritable, or timid, and deficient in self-command. In these circumstances, not only are the different steps of the operation rendered extremely difficult and embarrassing to the operator, and hazardous to the patient, but an involuntary contraction of the muscles of the eyeball, after the section of the cornea has been completed, has in many instances emptied the eyeball of its contents. To show the difficulties that may arise from this cause, I may mention the case in which I extracted a cystocercus from the eye of a girl 8 years of age. The section of the cornea was made without difficulty, and in a perfect manner, but no inducement could make the girl again open the eyelids. To use force was out of the question. Indeed, the mere involuntary contraction of the muscles of the eyeball, forced out the animalcule, and along with it the lens, without my having even attempted to open the eyelids. Had any such attempt been made I have not the least doubt that the vitreous humour also would have been discharged, and all hope of vision irrecoverably lost; as it was, the iris partially protruded, and adhered to the cornea, diminishing the size and altering the form of the pupil. The sight is rendered still further imperfect from subsequent opacity of the capsule of the lens. This may, however, be in a great measure remediable by operation, should it at any future period be rendered expedient.

* Dr Mackenzie, in his excellent Treatise on Diseases of the Eye, says, "The slightest touch, when the vitreous humour is dissolved, is in general sufficient to make the cataract sink to the bottom of the eye." But still Dr Mackenzie says, that, in such a case, he would extract through a small section of the cornea, as the "only mode which is safe and proper under such circumstances." I cannot well conceive how such an incision as would admit the lens to escape could be made without allowing the whole of the fluid vitreous humour to flow out,—an accident always followed by total loss of sight; and were the lens "by a slight touch" to be separated from its connections, and "sink to the bottom of the eye," it would not be an easy matter to lay hold of and extract it.

In all cases, therefore, of soft or fluid cataract, or when any of the above-mentioned objections to the operation of *Extraction* are present, the needle must be employed.

But a most important question remains to be solved, viz. whether a hard cataract, when none of the obstacles alluded to are present, ought to be *Extracted* or *Displaced*. On each side of the question, we find ranged the names of the most distinguished in our profession, so that we cannot settle the point by referring to authorities. It may be expedient, therefore, to compare the advantages and disadvantages attendant upon each mode of operating, and the relative success which has resulted in so far as that can be ascertained.

The operation of *Extraction* has almost invariably been performed nearly in the same manner, viz. by making a semicircular incision through the cornea, by which the opaque lens is removed from the eye.

On the other hand, the operation by displacement is performed either by entering the needle through the cornea, or through the sclerotic, also by *Depression*, that is, pushing the lens perpendicularly downwards, or by *Reclination* as it is termed, by which the lens is imbedded in the vitreous humour, with its anterior surface turned upwards, and its upper edge backwards.

It is evident, that before we can compare the operations of *extraction* and *displacement*, it is necessary that we should determine in what mode the latter ought to be performed.

In the first place, it appears to me that the needle should be invariably entered through the sclerotic.

The following objections may be stated to the passing the needle through the cornea, or the operation of *Keratonyxis*, as it is termed.

1st, If inflammation follow, it is most apt to occur in the wounded part, and may destroy the transparency of the cornea, which is essential to vision.

2d, From the edges of the wound in the cornea forming the fulcrum on which the needle is moved in its different motions, and from its not being a simple incised wound, it is apt not to close immediately, consequently the aqueous humour drains out, the Iris is thereby brought in contact with the wound, to which it may adhere, and render the pupil permanently distorted.

3d, The margin of the Iris impedes the motions of the needle; besides, from the pressure made upon this membrane, in the act of displacing the cataract, it has become paralyzed, in every instance in which I have seen this operation performed.

4th, The needle being entered through the cornea, it is almost impossible to displace the lens, except in the direction of

the iris, and ciliary processes, by which disorganizing inflammation of the eye is almost certain of being excited. The point of the needle is also apt to come in contact with and lacerate the retina.

5th, The needle can scarcely be made to avoid transfixing or spitting the lens, being entered almost at a right angle to that body, so that if the lens be of a firm or glutinous consistence, it will adhere tenaciously to the needle, and in the attempts to disengage it, either the vitreous humour will be broken up and poached, or the iris will be pressed between the lens and cornea in withdrawing the needle from the eye, and the operation be left not only unfinished, but the eye in a most dangerous condition.

6th, The hand of the operator intervenes between his eye and that of the patient; he cannot therefore distinctly follow the movements of the needle, or of the cataract, and particularly at the moment when, to *Displace* the latter, it is necessary to raise the hand.

These objections appear to me sufficiently strong to forbid the introduction of the needle through the cornea in *displacement*, more especially as I am not aware of any advantage that can result of any importance.

The operation is not so objectionable for the purpose of breaking down a soft cataract, although by no means so advantageous as that through the sclerotic.

DEPRESSION.—In the operation of *depression*, the opaque lens is supposed to be pushed perpendicularly downwards, till its upper edge has passed below the margin of the pupil, so that it may no longer interrupt the admission of light into the interior of the eye.

On examining the relative diameter of this part of the eye into which the lens is supposed to be *depressed*, and that of the lens, it will at once be apparent that such an operation is impracticable. In fact, before the upper edge of the lens can be made to descend below the margin of the pupil, its lower edge must have come in contact with the coats of the eye, and if it be attempted still farther to depress the lens, its lower edge will glide towards the back part of the eye, and the upper be directed against the posterior part of the iris, the retina and choroid being at the same time ruffled and injured, or perhaps the lens may even be forced through the substance of these membranes. Indeed Daviel says, that he has found, on dissection, the lens placed between the retina and choroid, and these two membranes torn in several places.

It is evident, therefore, that by *Depression*, the lens will be imperfectly imbedded in the vitreous humour; part of it being

situated in the posterior chamber of the aqueous humour, it will consequently be apt to reascend. It is also evident that injurious pressure will be made on the iris, retina, and choroid, and inflammation, or total destruction of the functions of the organ may be the consequence.

For these reasons, the operation of displacement by *Depression* ought not to be attempted, and is always, and in all circumstances, unwarrantable.

We have now to decide whether, in a case of hard cataract, the operation of *Reclination* or that of *Extraction* is to be chosen.

To determine this point it will be necessary to consider the advantages and disadvantages attendant upon each mode of operating.

EXTRACTION.—In *Extraction*, the wound in the cornea must be sufficiently large to admit of the easy removal of the lens. In making this incision the iris is apt to bulge under the edge of the knife, from which position in many cases it cannot be extricated, so that we must either relinquish the operation for the time, cut through the iris, or enlarge the incision by scissors, after withdrawing the cataract knife. By any of these proceedings much injury is done to the organ, and violent inflammation is liable to follow.

If the cataract knife be not well tempered, and its point very sharp, or if the cornea be unusually hard, the point of the knife, instead of transfixing the cornea, bends towards the iris, so that the operation cannot be completed without a change of instruments, by which, also, the organ is apt to be injured, and the danger of subsequent inflammation increased.

The incision in the cornea being completed, if pressure be made on the eye, or if the muscles of the eyeball contract powerfully, the whole, or part of the vitreous humour, may be discharged. If the whole, the sight is irrecoverably lost,—if a part, the hyaloid membrane, in the cells of which the vitreous humour is contained, necessarily intervenes between the lips of the incision in the cornea, preventing or retarding their union. Attempts to replace the hyaloid membrane by the probe commonly call into action the muscles of the eyeball, by which a still greater portion is protruded.

I have seen the whole vitreous humour escape on the completion of the incision through the cornea, in consequence of undue pressure on the eyeball,—of spasmodic contraction of its muscles, also from a disorganized state of the cells containing this humour. In each case, it was followed by total loss of the eyeball from the inflammation which followed. Such are the accidents which are apt to occur during the performance of *Ex-*

traction even by the best operators, some of which cannot be avoided by any degree of care or skill on the part of the surgeon.

Even when none of the above accidents occur during the performance of the operation, still, so severe an injury as the eye necessarily sustains, is usually followed by violent inflammation, which is indeed the most frequent cause of the failures in *Extraction*. When the inflammation is severe, the incision in the cornea does not heal, the lips gape, and the iris protrudes. If it be subdued at this period, a large and unseemly cicatrix, and irregular or obliterated pupil is the result, with a greater or less injury to the sight. If the inflammation proceed, suppuration and destruction of the organ is the consequence. In some instances, inflammation of the sclerotic and iris takes place, followed by effusion of lymph, and obliteration of the pupil. *Amaurosis* may also occur, either as the immediate effect of the injury inflicted during the operation, or of the subsequent inflammation. "It very rarely happens," says Dr Mackenzie, "that this operation is not followed by such a degree of inflammation in one or other of the textures of the eye, as to require the abstraction of blood from the system. So well established is this observation, that some make it a general rule to bleed the patient at the arm in the course of the first twenty-four hours after the operation, whether pain is complained of or not."

In so hazardous a state is the eye placed by this operation, independent of the risks I have already mentioned, that "the patient must be put to bed with as little movement of the head and body as possible. A careful assistant or experienced nurse sitting constantly by the bed side for forty-eight hours, or even for several succeeding nights, ought attentively to watch the patient when he wakes, taking care especially that he does not turn suddenly round upon the eye which has been cut, or put up his hand to rub the eye. If there is any particular reason to dread the latter accident, it may be proper to muffle the patient's hands, and pin them down by his sides."*

Such are the accidents which are apt to occur from the operation of *Extraction* of the cataract. It is admitted, that, if the patient escape all these dangers, his sight will be as perfect as it is possible to be, after the removal of the lens.

RECLINATION.—In the performance of *Reclination* through the sclerotic, the following parts must necessarily be wounded, viz. the conjunctiva, sclerotic, choroid and vitreous humour; but it is not contended by the advocates for *Extraction*, that any per-

* Mackenzie.

manent bad consequences can result from this part of the operation; nay, it is admitted that the injury inflicted is altogether trifling in comparison with that caused in the operation of extraction.

It is objected to the introduction of the needle through the sclerotic, that the long ciliary artery or the ciliary processes may be wounded, and blood thereby effused into the chambers of the aqueous humour, obstructing the view of the cataract and of the needle, and thereby preventing the completion of the operation. Such an accident is possible, but it may in almost every instance be avoided. It has never happened in my own practice, although I have passed the needle through the sclerotic at least three or four hundred times, and I have never seen it occur in the practice of others.

It is also said that the retina may be wounded, either in the introduction of the needle, or in the act of reclining the cataract. This accident may take place, but it must be occasioned solely by unskilfulness on the part of the operator, so that if the objection hold good at all, it is in reference to the operator, and not to the operation. The same remark is applicable to the objection that the lens may be placed in contact with the iris or ciliary processes, and acting as a source of irritation, induce iritis. In the operation of *depression* this accident must have been of frequent occurrence.

Perhaps the chief objection to the operations by the needle in cases of hard cataract is, that the patient is constantly exposed to a return of the disease by a reascension of the lens, and therefore that the cure is only palliative.

This objection is certainly applicable to the operation of *Depression*, in which the lens, as I have stated, can be only imperfectly imbedded in the vitreous humour, and in cases in which the cells of the vitreous humour are disorganized. The lens also may perhaps return to its original situation if the operator entangle his needle in the substance of the lens, and in his endeavours to disengage it breaks up entirely the hyaloid cells. But I have never yet seen the lens reascend after being fairly *Reclined*, and deeply imbedded in the vitreous humour. Scarpa distinctly says that he does not recollect a single case in the whole course of his practice in which the lens returned to its original situation after being *Reclined*.

Undoubtedly, a passage is made by the lens through the vitreous humour, but its reascension through that passage is prevented, (to say nothing of the greater specific gravity of the lens than of the vitreous humour, to which I attach little importance,) by the subsequent closure of the passage by adhesion,

which we can scarcely doubt takes place, but which appears to have been entirely overlooked by authors. Every other part of the system when wounded undergoes a reparative process, and I cannot conceive the hyaloid membrane to be an exception to so general a law; and in the accounts of dissections of eyes which had been operated on by *reclination*, there is no notice of any such pervious passage through the vitreous humour.

I have had an opportunity of examining two eyes only which had been operated on by *Reclination*, and they were both from the same patient.

The following were the appearances presented.

Right Eye.—Pupil perfectly clear. The lens enveloped in its capsule was placed about midway between the iris and back part of the eye, and towards its outer side. It lay within about half a line of the retina, a portion of vitreous humour being interposed. It adhered firmly by its capsule to the hyaloid membrane, but had no attachment to the retina. There was no vestige of the course it had taken through the vitreous humour, the whole being equally firm and transparent. The hollow in which the lens was originally situated was partially obliterated, and the posterior chamber of the aqueous humour appeared larger than usual.

Left Eye.—The upper part of the pupil was partially obscured by a shred of opaque capsule, which adhered by a single point to the margin of the iris. The lens was in a similar situation to that of the right eye, not surrounded by its capsule, but reduced to about one-third of its natural size, and apparently in contact with the retina. It was closely surrounded by the vitreous humour, in which it appeared indented, but not adherent to it. It was of a pearly white colour and firm consistence. As in the right eye, the vitreous humour was uniformly transparent and equally firm, without the slightest trace of the passage through which the lens must have passed. The patient was 69 years of age, and I had operated upon him for cataract about two years previous to his death. He could read with either eye with the assistance of convex glasses.

Velpeau (*Medecine Operatoire*, Tom. i. p. 749,) mentions that he has examined the eyes of twelve individuals who had been operated upon for cataract by *Displacement*, and in every instance except one the cataracts had contracted adhesions with the retina and choroid, by means of the hyaloid membrane forming a sort of knot or cicatrix of about three lines in length.

We have thus the result both of experience and dissection in favour of the opinion that the *Reclined* cataract does not re-ascend. There can be no doubt that when the cataract is simply *depressed*, it will frequently return to its original place.

The objection to the operation of *Reclination*, which is considered by many to be of the greatest weight, is, that the lens remains a constant source of irritation, and that by its pressure and friction on the retina it is apt to induce chronic internal inflammation and amaurosis.

As the lens is imbedded and fixed in the vitreous humour, and as no motion exists between the vitreous humour and retina, it is clear that there can be no friction, and, besides, if there were motion between these parts, the surface of the lens is so perfectly smooth, that no injury would result. Again, allowing that the lens is in contact with the retina, which in the majority of cases I believe is not the case, the whole pressure it can exert will be proportioned to the difference in the specific gravity of the lens, and of the vitreous humour, but this difference is very trifling. The lens, if left to itself, is not heavy enough to sink to the bottom of the vitreous humour, but, at the same time, when once depressed, its difference in gravity is such as to prevent its being floated up to the surface again, even if it did not contract adhesions, or if the passage in the vitreous humour through which it had been depressed did not become obliterated. (Specific gravity of aqueous humour, 1.0003; do. of vitreous do. 1.0009; do. of lens do. 1.0790.) But the best argument which can be adduced is the result of the operation. Scarpa in speaking of internal ophthalmia followed by amaurosis, as taking place after the operation of *Reclination*, says, "This distressing accident has only happened to me in a single instance during my long practice." It cannot therefore be considered as arising from the pressure of the depressed lens, otherwise it would be of more frequent occurrence. I myself cannot say that I have witnessed any case of internal ophthalmia followed by amaurosis, which was distinctly traceable to the irritation arising from a reclined lens.

There is a very interesting case related by Scarpa of Signor Lattuada, a young man 25 years of age, in whose right eye there is no iris, and apparently no hyaloid membrane. The lens inclosed in its capsule is free from all attachment, and is perceived moving in the cavities of the eye in various directions. When he inclines the head forward, it comes in contact with the cornea, when backward, it falls to the back part of the eye, with the same facility as it would do in a watery fluid. If he remains long in the horizontal position, as during sleep, and consequently with the lens resting on the bottom of the eye, he has never experienced the slightest uneasiness, and he has never been affected with pain or inflammation of the eyes. By means of a convex glass he can distinguish well minute objects. In the left eye, the derange-

ment is less. There is a small strip of fringed-shaped iris at the temporal angle. The lens with its opaque capsule is suspended in its place by a short attachment, which it has preserved with the ciliary zone at the upper and temporal part,—a proof, it would appear, that in this eye the vitreous humour is not entirely disorganized and dissolved into water. There is no attachment whatever of the rest of the capsule or lens, and during the motion of the eyeball and head, it oscillates a little from before backwards. Surely the right eye of this individual ought to have suffered from internal ophthalmia and amaurosis, if either pressure or even friction of the lens on the retina be capable of inducing such consequences, admitting that original malformations do not always produce the same effects as when the results of disease.

One of the principal causes of the failure of the operations for the cure of cataract by *Extraction* is the violence of the inflammation which follows. So violent, indeed, is the inflammation in many cases, that the depleting measures required often are productive of irreparable injury to the general health of the patient. The argument employed by Mr Guthrie for operating on both eyes at the same time is, that the patient, should inflammation occur, may be able to bear up for once under the active treatment that may be requisite, although he might not be able to do so a second time, were another operation performed. It is not my intention to enter at present on the consideration of the soundness of this argument. I adduce it simply to show the severity of the inflammation that frequently follows the operation of *extraction*.

On the other hand, the operation of *reclination*, if properly performed, is rarely productive of much inflammatory action. So rarely, indeed, that it is almost never necessary to open a vein to subdue it.

Although the observations which I have made on the comparative advantages of the operations of *Extraction* and *Displacement* lead to the opinion that the latter is the more successful; still, as mere reasoning on such subjects often leads to false conclusions, I have endeavoured to obtain as correct an account, as possible, of the actual results of these two modes of operating, in the practice of different surgeons, and these strongly confirm the opinion, that *displacement* is the preferable operation, as is shown in the following tabular views.

BY EXTRACTION.

Operators.	Cases.	Cured.	Relieved.	Failed.
Graefe, Berlin, (1.)	19	18	—	1
Rosas, Vienna, (2.)	26	22	1	3
Daviel, (3.)	240	207	—	33
Hotel-Dieu from 1806				
—10, (4.)	70	19	6	45
Pamard, (5.)	359	302	—	57
La Faye, (6.)	6	2	2	2
Poyet, (7.)	7	2	2	3
Roux, (8.)	306	188	—	118
Pelletan, (9.)	50	20	—	30
Dupuytren, (10.)	50	20	—	30
Jules Cloquet, (11.)	80	28	—	52
Fabini, Pesth. (12.)	94	71	—	23
Total,	1307			397

Or $30\frac{3}{10}$ per cent. of failures, or about three in ten.

BY DISPLACEMENT.

Operators.	Cases.	Cured.	Relieved.	Failed.
Graefe, (13.)	14	12	—	2
Hotel-Dieu from 1806				
—10, (14.)	43	24	4	15
Bowen, (15.)	160	154	—	6
Lusardi, (16.)	5034	4168	—	866
Dupuytren, (17.)	306	263	—	43
Jules Cloquet, (18.)	166	97	—	69
Morand, (19.)	6	3	—	3
Total,	5729			1004

Or $17\frac{5}{10}$ per cent. of failures, or one and three-quarters in ten.

It is to be regretted that so few authors have given an account of the proportion of successful cases and failures, according to the mode of operating adopted. On looking at the above table, we must be at once struck by the great relative success of the operation by displacement.

In the tabular view are included a great number of cases ope-

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- (1.) Berlin Report of Clinicum Ophthal. 1833.
(2.) Report of Vienna Institution, 1832-33.
(3.) Mem. de. l'Acad. Roy. de Chir. Tom. v.
(4.) Tartra de l'Operat. de la Cataracte, 1812.
(5.) Velpeau, Medecine Operatoire, Tom. i.
(6.) Memoires de l'Acad. de Chirurg. Tom. vi.
(7.) Memoires de l'Academ. R. de Chirurg. Tom. vi.
(8.) Velpeau. Op. Cit. Tom. i. (9.) Do. (10.) Do. (11.) Do.
(12.) Kleinert's Repertor. Vol. v. part 3, page 3.
(13.) Report of Berlin Clinic. Ophthal. 1833.
(14.) Tartra de l'Oper. de la Cataracte, 1812.
(15.) Velpeau, Tom. i. (16.) Do.
(17.) Sabatier Med. Operat. Vol. iv. 1824. (18.) Velpeau, Tom. i.
(19.) Mem. de. l'Acad. Roy. de Chir. Tom. vi.

rated on by *Depression*. In as much, therefore, as the operation of *Reclination* is preferable to *Depression*, in the same degree ought the resulting success in such cases to be greater than that stated.

It is proper also to remark, that the operation of *Extraction* is usually performed only in the most favourable cases, whereas that by *Displacement* is had recourse to even in the most unfavourable circumstances, and it is evident that the apparent success would have been still greater from displacement, had that operation been performed only in those cases in which the operation of extraction was advisable. To show that such is really the fact, I subjoin a statement of the cases of *hard cataract*, without any complication, and in eyes *otherwise healthy*, on which I have operated. Under the head of successful operations, I have placed all those persons who were able to read moderate sized print, with the aid of cataractous glasses. Under the head of relieved, I have placed those who, though unable to read, were able to guide themselves without assistance. All others I have classed as failures. Of 179 cases of hard cataract *without any complication*, there were operated on by

		Cured.	Relieved.	Failed.
Extraction,	64	32	14	18
Reclination,	115	94	10	11

Proportion of failures by extraction $28\frac{1}{8}$ per cent.

Proportion of failures by reclination $9\frac{1}{2}$ per cent.

Causes of Failure.

Suppuration of Eyeball.	Atrophy of Eyeball.	Opact. of Cornea.	Obliteration of Pupil.	Amaurosis.	Total.
Extraction.					
3	5	4	3	3	18
Displacement.					
2*	3	—	4	2	11
Causes of partial failure.					
Extraction.					
—	—	5	4	5	14
Displacement.					
—	—	1	5	4	10

* These are the only examples which have occurred in my own practice of suppuration of the eyeball following the operation of displacement, and are, I believe, to be attributed to the state of the constitution of the individual at the period of operation. The patient was a female nearly fifty years of age; the menstrual discharge had ceased a few months before; she was of a full habit, but apparently in good health, but, I have since learned, addicted to drinking. I operated on both eyes about mid-day. Nothing untoward occurred during the operation, the cataracts being reclined with facility. On examining the eyes, the following day, both corneæ were completely infiltrated with purulent matter, the conjunctivæ in a state of chemosis, the vessels large and tortuous, and the patient scarcely complained of uneasiness. In spite of vigorous treatment, the corneæ of both eyes burst on the third day, and their contents were discharged. This is the only instance in which I have operated on both eyes on the same day, a practice followed by many distinguished surgeons, but which is liable to many serious objections.

I have given in this table cases of *hard* cataract only, without any such *complication* as would preclude the operation of extraction, it being admitted that soft cataracts ought to be broken down by the needle, and that when the cataract is hard, but complicated with adhesions of the iris, obliteration of the pupil, diseases of the cornea, &c., the mode of operating, and the degree of success, will vary according to the peculiarities of each individual case. They could not, therefore, afford any means of comparison between the operations of *Extraction* and *Reclination*.

From what has been stated the following conclusions may be drawn.

1. That the safest mode of operating when the cataract is soft is by breaking it down, and thereby effecting its absorption.

2. That in all operations in which the needle is used, that instrument ought to be entered through the sclerotic, and not through the cornea.

3. That in cases of hard cataract, complicated with the various diseases of the eye and its appendages, mentioned above, the needle ought to be employed, the mode of operating being adapted to each individual case.

4. That hard cataract without such complications may be effectually removed by the operations of *Extraction* or *Displacement*.

5. That the operation of *Depression* is impracticable, and that attempts to perform it will be productive of the most injurious results.

6. That many of the accidents which may occur during the operation of *Extraction* cannot be avoided by any degree of skill or dexterity, and, therefore, form valid objections to the operation.

7. That the accidents which may occur during the operation of reclination arise from faults on the part of the operator, for as soon as the needle is entered, he has complete command over the eye. They do not, therefore, form valid objections to the operation.

8. That the resulting success from the operation of *Reclination* is very much greater than that from *Extraction*.

9. That in cases of failure of the operation by *Reclination*, the eye, in the majority of instances, is not left in so hopeless a condition as when the operation of *Extraction* has failed.

10. That, in consequence of the comparatively rare occurrence of violent inflammation after *Reclination*, there is infinitely less likelihood, than in cases of *Extraction*, of such depleting measures being required as may prove ruinous to the general health of the patient.

58, Queen Street, Edinburgh.

