ON CERTAIN MODIFICATIONS OF VON GRÄFE'S LINEAR OPERATION FOR THE EXTRACTION OF CATARACT.*

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I BELIEVE that most ophthalmic surgeons agree that the modified form of linear extraction, which was introduced by the late Professor von Gräfe, has been attended with a larger average of success than any other form of operation that has been devised. Whilst nothing could be more perfect than a completely successful flap-extraction, the risks of that operation were so many and so great, that a comparatively small percentage of perfect results could be obtained, and many eyes were lost. Von Gräfe's operation was devised to minimise, by its iridectomy and smaller wound, most of the dangers that were inseparable from the large wound of the flap-extraction; and it fulfilled its objects so well that nearly ninety per cent. of the eyes operated upon were attended with success, having an acuity of vision of from $\frac{1}{4}$ to $\frac{5}{8}$. Of the ten per cent. that were unsatisfactory, the majority were improved by subsequent operation. Von Gräfe's own conclusions, after a considerable trial of his operation, and without any selection of his cases, were these.

1. In eyes favourable for flap-extraction, the prospect of success is certainly equally great by the new method.

2. In eyes unfavourable for flap-extraction, the prospect of success is considerably greater.

3. In consideration of the diminution of inconvenience to the patient, and of duration of treatment, the new method of operation may be accepted and practised to the entire exclusion of the flap method.

These conclusions were accepted by the great majority of ophthalmic surgeons, and the main features of von Gräfe's operation are still very largely followed. It is true that numerous modifications have been introduced and tried with the view of counteracting the difficulties of individual operators, but few of them have been accepted as general improvements. There has, however, been a very general desire to accept the proposal of making the section entirely in the cornea. With the sclerotic section, or even with the sclero-corneal section, it happened to some operators that vitreous was frequently lost; and in unsuccessful cases, when a sclerotic section has been followed by destructive inflammation of the eye, sympathetic mischief in the other has not been altogether unknown.

It may perhaps be thought an act of presumption on my part to say that I confirm the conclusions with regard to this operation enunciated by so great a master as Von Gräfe; but I speak after a lengthened practical experience of the method, and after comparing it with such other methods as have from time to time offered a reasonable promise of success. Of these, the best has undoubtedly been the operation of Dr. Warlomont of Brussels. I need not describe it. I will only say that I tried it in thirty cases, and that the following reasons led me to abandon it. 1. There is a considerable risk of iritis. 2. The margin of the pupil frequently becomes adherent to the corneal wound. This anterior synechia, with greater or less distortion of the pupil, occurred in no fewer than sixteen out of the thirty cases. 3. A white cicatricial opacity often remains in the line of the corneal section. 4. There is an increased liability to a varying amount of irregular astigmatism, sometimes very considerable, depending apparently upon the nearer position of the section to the axial portion of the cornea, and seriously diminishing the acuteness of vision. I called special attention to the amount of astigmatism in these cases in a paper I had the honour of reading before the Surgical Section at the meeting of the Association in London in 1873.

I have then, from each new method, reverted with satisfaction to von Gräfe's modified linear extraction; but I was early induced to introduce certain minor modifications of my own, or, rather, I would prefer to call them attentions to minor, yet important, details, for every surgeon knows that it is on these that the success of all operations, in a large measure, depends. These modifications, if such they may be called, may not suit everyone's mode of operating; but a careful attention to them will minimise dangers, and, in my own hands, they have been attended with a very considerable success, as I shall show by giving an analysis of 100 consecutive cases. But, first, let me describe the points to which I attach importance, and the modifications that I have followed.

1. I always have the pupil well dilated with atropine on the morning of the operation.

2. I always give an anæsthetic, unless it be contraindicated, or unless I can be sure of the complete quietude of my patient. Only six per cent. have been operated on without.

3. The section is corneal, but sufficiently peripheral to be sub-conjunctival; the puncture and counter-puncture, which are a little lower than in von Gräfe's operation, alone being just outside, or in the sclero-corneal junction, according as there is reason to believe that there is a large or a small nucleus.

4. The section is made with extreme deliberation, with scarcely more pressure than the weight of the knife; and, in making the middle of the section, the edge of the blade is not turned much forwards, the desire being that the middle of the section should be only just within the margin of the cornea. It is important that the knife be sharp, in order that no force be used in making the section, thereby avoiding all risk of disturbing the coats and contents of the eye.

5. Sometimes, but not always, after the section has been made, the end of the section answering to the counter-puncture is just touched by the end of the blade of von Gräfe's knife, so as to make the section of the internal surface of the cornea correspond with the section of the outer surface, as is already the case at the point of puncture. This is important only when the section is somewhat small, or the nucleus large.

6. A period of rest of at least one minute is taken after each step of the operation, to give the eye time to adapt itself to the new conditions of circulation and tension.

7. A free crucial incision is made in the anterior capsule.

8. A gentle coaxing out of the nucleus and all the soft lens matter is made with the smooth back of the curette, taking care that the surface of the cornea is moist before passing the curette over it, avoiding, at the same time, all force, and using the hook at once if the nucleus does not readily escape.

9. A careful tucking-in is made with the end of the curette, of any portion of iris or uvea that may be occupying the angles of the section. A neglect of this precaution sometimes postpones the healing of the wound, and leads to the formation of a cystoid cicatrix, which may, at some future time, be a cause of irritation in the eye. It is also important carefully to adjust the conjunctival flap over the wound.

I use the same instruments as were recommended by von Gräfe, except that I prefer the iris-forceps curved at the points, instead of straight, and the iris-scissors made in the form of forceps, as they are then as convenient for use with the left hand as with the right. As a result of an attention to these points, I claim:

1. An immunity from rupture of the hyaloid, or what does duty as a hyaloid, and, therefore, from loss of vitreous humour except when the latter is very unhealthy, about five per cent.;

2. Diminished frequency of the occurrence of iritis and other inflammatory conditions;

3. A more rapid convalescence, twelve to twenty days; average fifteen days;

4. An increased proportion of cases, in which the patient is able to read "brilliant" type.

The after-treatment is that recommended by von Gräfe. It is rarely necessary that the patient should be kept in bed beyond the third day, or confined to the house beyond the twelfth or fourteenth, I most rigidly abstain from looking at the eye before the fourth day, and often wait until the sixth or seventh. I have for many years given up the practice of keeping my cataract patients in a dark room. A curtain, or screen, placed between the patient's head and the window or light is sufficient, the eyes, of course, being tied up with pads and bandage. I need hardly say that the healing of the wound takes place more readily, and that the health of the patient is better maintained if, whilst the eyes are carefully shielded from the light by the proper pads and bandage, and a light shade of good size, the body be placed under the usual conditions of light and air.

Of a hundred consecutive cases of extraction of cataract, in which the details of the operation described in the paper were observed, thirty-one eyes could read "brilliant" 3 (No. 1); six acquired $\frac{1}{2}$ (33), the rest were astigmatic, the distant vision at the last examination varying from $\frac{1}{4}$ to $\frac{5}{8}$ (33 to 33). Relying upon the gradual diminution of the astigmatism, I do not attempt to correct it until twelve or eighteen months after the operation. The majority of patients, content, I suppose, with their spherical glasses, do not return for further examination. I believe that nearly all the eyes that could read "brilliant" type could have been brought to $\frac{1}{2}$ with proper cylindrical glasses. Sixteen could read "pearl" .6 (No. 2); fourteen, 9 (No. 3)

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eight, 1.2 (No. 4); four, 1.5 (No. 5); seven, 1.8 (No. 6); three, 2.4 (No. 8). In five the result was good, but the acuteness of vision was not recorded. Two eyes could read 4.8 (No. 16); five could count fingers; two had perception of light; three were lost—one from sloughing of cornea (great feebleness), and two from general inflammation (alcoholic excesses). In twenty-one cases, a subsequent needle-operation was required, resulting improvement recorded in only a portion of the cases; in five cases, a slight amount of vitreous humour was lost; in eleven cases, some iritis occurred, not counting the three eyes that were lost.

NOTE.—The test-types referred to are those for determining the acuteness of vision, drawn up by the author of this paper, to correspond with the series of large types of Dr. Snellen and others. The limbs are, in diameter, as nearly as possible, one-fifth of the height of the letters, and the figures over each size give the number of metres and feet at which the letters are seen by a standard eye. Words of one syllable are chiefly chosen, as facilitating the testing of the eyes of those who read imperfectly. They were printed and published by Harrison and Sons, St. Martin's Lane.

THE CHANGES IN THE RENAL GANGLIA IN BRIGHT'S DISEASE.*

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In the *American Journal of Medical Sciences* for July 1880, there is a very able paper, by Drs. Da Costa and Longstreth of Philadelphia, entitled "Researches on the State of the Ganglionic Centres in Bright's Disease."

They give the particulars of nine cases of Bright's disease, with microscopical details of the changes in the kidneys and semi-lunar ganglia. They divide their cases into three groups: the first includes two cases of well-marked contracting kidney; the second, three cases of the mixed type of chronic Bright's disease; and the third, one case of large white kidney, one of recent nephritis after typhoid fever, and two of chronic Bright's disease, with large coarse diffusely diseased kidneys.

It is impossible to avoid feeling somewhat confused by the heterogeneous composition of these groups; and, in order to place the results of their investigations in a clearer light, I have ventured to summarise the conclusions which I think may be fairly drawn from these nine cases.

(a.) In acute or subacute nephritis (Case IX), the only change met with in the ganglia was an increase of the cell-elements of the stroma.

(b.) In the large white kidney (Case VII), the connective tissue of the ganglia was loose and swollen, and its cell-elements increased. The ganglionic cells were generally normal, degenerative changes being present in about one third. There were no vascular changes.

(c.) In the mixed forms (Cases III, IV, V, VI, and VIII), the connective tissue was increased, and its cell elements were numerous; the ganglionic cells were more or less fatty and pigmented; the blood vessels were dilated and thickened in two cases.

(d.) In typical contracting kidney (Cases I and II), the stroma of the ganglia was increased in amount, but contained few cell-elements; the ganglionic cells were generally shrunken, deformed, fatty, and pigmented; the blood-vessels were dilated and hypertrophied.

After giving these descriptions, the authors proceed to consider the relations of the ganglionic lesions to the renal disease; and, after stating that they may be regarded as either causes, concomitants, or results of one another, accept the view that the changes in the ganglia stand in some way as causes to certain forms of Bright's disease, especially the contracting form. In explanation of this view, they propound the following theory of the *modus operandi*. "The specific cause, whatever may be its unknown form or character, acts in such a manner on the ganglion-cells presiding as centres of innervation to the kidney, and whose fibres, distributed to the vessels of these organs, regulate, not only the calibre of the vascular trunks by changing the state of contraction of their muscular fibres, but also probably the conditions of osmotic action between the blood and the tissues, that the collective phenomena known as Bright's disease are brought about."

They also express the opinion that the hypertrophy of the heart is the result of similar changes in the cardiac ganglia, though they offer no evidence in support of it.

I have examined the semilunar ganglia in fifteen cases of Bright's disease, viz.: Acute Bright's disease (1); Large white kidney (3); Mixed large white and waxy kidney (1); Mixed fatty and contracting kidney (7); Small contracting kidneys (3). I possess microscopical preparations and drawings of each of these.

Fig. 1 is a drawing of part of a semilunar ganglion from a case of acute nephritis in a boy, aged 5, which was probably postscarlatinal; but my knowledge of the case is limited to the fact that it came to the *post mortem* room with the diagnosis "acute nephritis". In this preparation, the only change to be observed is the increase of round-cell elements in the stroma. The ganglionic cells stained well; they are well formed, and show no trace of pigment. The vessels were normal.

Fig. 2 shows the state of the ganglia in a case of large white kidney in a young man, aged 28, who died under my care. The stroma is very much increased, the cell-elements are fairly numerous; the ganglionic cells are pale, but for the most part free from pigment, and well formed. The vessels are not thickened.

In the mixed forms, the lesions in the ganglia occupy an intermediate position between those seen in Figs. 2 and 3. The stroma

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