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“POSTERIOR NEEDLING” IN THE TREATMENT OF LAMELLAR AND OTHER FORMS OF SOFT CATARACT

BY

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IF one may judge by the absence of all reference to it in current text books, the method of causing solution and absorption of the crystalline lens, by division of its posterior capsule, must be quite unfamiliar to at least the younger ophthalmic surgeons of the present day. I learned the operation from my seniors, and it has been practised in Glasgow for many years, both in the Eye Infirmary and in the Ophthalmic Institution, but I have been unable to trace its source.

The procedure has so much to recommend it that it would be unfortunate if it were not more widely known and practised. It is not my intention, of course, to discuss, in this place, the indications for the removal of the lens in lamellar and other forms of early cataract.

The knowledge that the substance of the lens underwent solution and subsequent absorption when exposed to the action of the aqueous humour, probably goes back to the early days of couching for cataract. It was recognised that in attempting to depress certain forms of cataract—fluid, flocculent, etc.—the needle ruptured the anterior capsule, lens matter entered the anterior chamber and its absorption followed. A slower but similar process of solution and absorption occurred in the broken lens lying in the vitreous chamber.

According to William Mackenzie, in the days of Celsus, the breaking down of the cataract into fragments by the couching needle was regarded as a proper supplementary step if displacement of the lens could not be satisfactorily performed. Barbette (1872) noticed that in such circumstances vision would be restored in seven or eight weeks. Many authors have been credited with some part in the experimental development of the discission operation (Read, 1706, Maître-Jan, 1711, Richter, 1773, Beer, 1783); but Pott (1775) and Conradi (1797) seem to have been the first to adopt it as a methodical procedure, independent of depression.

In the couching operation, the needle might be passed through the cornea and anterior chamber; or through the sclera, and between the lens and the iris, into the pupillary area, before the actual couching manoeuvre. So, in his discission operation, Conradi chose the corneal route (*Keratonyxis*) while other surgeons preferred the scleral route (*Scleronyxis*). William Mackenzie describes the operation by the scleral route under the name of *Hyalonyxis*, since the needle, having punctured the sclera about four millimetres behind the corneal margin, first enters the vitreous chamber. Its point is then turned forward and passes between the ciliary processes and the equator of the lens, then between iris and lens and into the anterior chamber, before being made to divide the capsule of the lens. In all these operations it was the *anterior* capsule which was lacerated, and the same applies to the operation as described by subsequent authors such as Weller, Travers, Pilz and others. I have found no literary reference to the operation of *posterior* needling as practised traditionally in Glasgow.

The Operation

The procedure itself is simple. The usual preparation of the eye is made and the pupil is under the influence of atropine. Anaesthesia by instillation of cocaine and adrenaline is sufficient. The

room should be darkened, and focal illumination by means of a hand lamp used. The instruments required are a speculum, fixation forceps and needle. Any sharp needle—Saunders, Knapp or Ziegler—may be employed.

The needle is passed through the sclera below the tendon of the external rectus muscle and five millimetres from the corneo-scleral junction, its point being directed into the vitreous forwards to the posterior pole of the lens. By carrying the handle of the needle backwards in the direction of the temple, the point is then turned forward and can be seen to enter the substance of the lens. A criss-cross incision is made in the posterior capsule and cortex of the lens, and the needle is withdrawn by reversing the direction of entry. Naturally, the operation occupies only a fraction of the time required to describe it. It is usual to bandage the eye for the first 24 hours, after which the bandage can be removed and the patient can move about without restriction. Atropine is continuously applied.

Opacity appears in the situation of the discission and spreads more or less throughout the rest of the lens. There is no forward swelling of the lens or shallowing of the anterior chamber. Some absorption of lens substance occurs, which apparently comes to a standstill in a week or two, and it is usual to repeat the operation after an interval of six weeks or more. The rapidity of absorption varies. Usually after two or perhaps three such needlings the lens is reduced to a thin membrane consisting of the capsule enclosing some opalescent remains of lens substance. When this stage is reached the case is completed by an anterior division of the membrane.

Advantages of the Operation

The aim of the operation is, of course, the same as that of anterior needling or discission, as usually practised, but after posterior needling it is never necessary to perform a curette extraction of the swelling lens. After anterior needling, it very occasionally happens that absorption of the dissolving lens matter keeps pace with the swelling, that the eye remains free from congestion and irritation, and that no further interference is required until a second and final needling divides the capsule and provides a clear pupil. But such a happy result is exceptional. It is impossible to pre-determine the result of a single anterior needling. Sometimes the effect is almost negligible. Again, a little opacity may appear in the lens and the process come to a standstill, apparently from closure of the capsular wound. In still other cases, the lens breaks up rapidly, masses of lens matter come forward into the anterior chamber, and the iris is pressed forward by the swelling lens.

If a curette extraction is not made at this stage, iritis or an acute rise of tension, or a combination of these two complications, may occur. This will necessitate the drawing off of the lens by linear extraction, under rather unfavourable conditions. A general anaesthetic will be necessary, and, even assuming a favourable outcome, the subsequent treatment will be somewhat prolonged. Needless to say, it will be necessary for the patient to be, from the beginning, in hospital or nursing home ; a serious matter from the economic standpoint.

The uncertainties of the anterior operation and the possible occurrence of the complications referred to, are discussed in all descriptions of the operation, and most operators must have experienced some anxiety with such cases.

Contrast with this the progress of a case of posterior needling. Here too there is some uncertainty as to the result of a single needling, and it usually has to be repeated ; but one can be certain that the patient will be spared the suffering incidental to the occurrence of iritis and secondary glaucoma.

From first to last there is no need for a general anaesthetic.

There is no necessity for the patient to be kept in bed. The cases may be treated as out-patients ; a great gain through the saving in nursing home charges or in hospital bed accommodation. For the same reason there is little or no loss of school attendance.

Complications

The question naturally arises : Is there not a risk of detachment of the retina, owing to the site of the needle puncture ? I can only recall one case in which, some years after this operation, a detachment of the retina was discovered. Assuming this to have been due to the operation, it is, so far as I am aware, unique among many scores of these cases, and no other complications have been noted. The risk seems a small one to set against the real dangers incident to the anterior operation.

Illustrative Cases

Most of my cases have been uncomplicated examples of congenital or juvenile cataract in which it was decided that the lens should be removed from one eye ; but the following three more unusual cases, occur to my mind as illustrating the usefulness of the operation.

Miss B. was operated on thirteen years ago at the age of five. About a year earlier, the left eye had been operated on elsewhere with an unfortunate result. In the right eye there was a total cataract. The child was physically healthy, but her mental development was subnormal. Posterior needling was done on the left eye

on March 30, 1923, and on August 12, 1923. There was complete solution of the lens, the capsule was transparent, and no further interference was necessary. The ultimate visual result with correcting glasses was 5/5 and J.1.

Master H. W., aged 11 years, was reported to have had defective sight since birth. He had been under the care of several oculists, but no operation had been advised, chiefly because he was under-developed mentally and took epileptiform fits, and his family doctor considered operation inadvisable. There were dense lamellar cataracts in both eyes. The corrected visual acuity was: R. 5/36, L. 5/24, and this was not improved with mydriasis. Posterior needling was done on the right eye under a local anaesthetic on September 29, 1925, October 6, 1925, January 14, 1926, and May 14, 1926, and a final anterior division on August 24, 1926. A perfectly clear pupil was obtained, and the final visual result was 5/9 (parts) and J.1.

In these cases the good result has been maintained for thirteen and eleven years respectively, and the improved vision has had a very salutary effect on mental development.

Master D. G. was first seen in October, 1928, aged 3½ years. There was congenital dislocation of the lens, upwards in the right eye and to the temporal side in the left. Refraction was estimated with difficulty, and -8.0 D.sph. ordered for constant wear. In 1930 this was altered to -10.0 D. giving 5/36. He was making fair progress at school, his right eye giving J.5 or 6 at very close range, but in 1934 distance vision showed some falling off, and in 1935 the left lens was found to have become opaque. It was decided to remove this lens and the posterior needling operation was done on January 2, 1936, February 8, 1936 and April 20, 1936. The lens was reduced to a small shrivelled mass below the iris at the temporal side, the pupillary area being crossed by strong zonular fibres. These were divided by anterior needling on May 16, 1936. The visual result one month later was 5/18 and J.2. No doubt this will improve. The operated (left) eye had a convergent squint in his earlier years, and the right eye was always the better seeing eye. In these cases, too, some time elapses before the full result of the operation is manifest.

Summary

The operation of posterior needling for the removal of congenital and other early cataracts is described, and its advantages indicated. Some cases are quoted to illustrate its usefulness and the results obtained.