HISTORY OF IRIDOTOMY: KNIFE-NEEDLE VS. SCISSORS-DESCRIPTION OF AUTHOR'S V - SHAPED MERHOD

Published @ 2017 Trieste Publishing Pty Ltd

ISBN 9780649250219

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Cover @ 2017

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History of Iridotomy

Knife-Needle vs. Scissors—Description of Author's V-Shaped Method.

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PHILADELPHIA.

LAKE FOREST

HISTORY OF IRIDOTOMY.

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PHILADELPHIA.

To Cheselden has been conceded the honor of being the father and originator of iridotomy. Nearly two centuries have elapsed since he first published the report of his procedure in the Philosophical Transactions for 1728. Ever since that time, his signal success has been acknowledged by all except those who either failed to equal his dexterity, or who were prejudiced by their ambition to originate a new method.

A careful review of the medical literature of the century and a half following Cheselden's announcement can not fail to impress the reader with the great interest attached to operations for the formation of an artificial pupil, which subject was considered second only in importance to that of cataract itself. Not only were a large number of monographs devoted wholly to this subject, but every work on general surgical topics set aside one or more chapters for the discussion of artificial pupil. This is in great contrast to the limited space which modern works on ophthalmology grudgingly yield to this still important subject.

It is difficult for us to appreciate the conditions which brought about so large a percentage of cases of pupillary occlusion. Crude surgical procedures, poor operative technic and the utter lack of asepsis often resulted in iridocyclitis or iridochorioiditis. The couching of the

*Read in the Section on Ophthalmology of the American Medical Association, at the Fifty-ninth Annual Session, held at Chicago, June, 1908.

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lens, the free discission of both hard and soft cataracts, the frequent introduction of the knife-needle through the dangerous ciliary zone, and the bungling efforts at extraction all increased the tendency to inflammatory reaction, while inadequate therapeutics and lack of antiphlogistic measures frequently permitted the deposit of plastic exudate in the pupillary area, thus resulting in membranous occlusion of the pupil.

OPERATIONS FOR ARTIFICIAL PUPIL.

For the sake of historical completeness, and in order to better emphasize the special domain of iridotomy, I will mention briefly the various methods that have been employed in making an artificial pupil. These are:

(1) *Division* of the thickened iris-membrane by an incision made either through the sclerotica or through the cornea. This is true *iridotomy*.

(2) *Excision* of a portion of the iris through a previously made corneal opening. This is now known as *iridectomy*.

(3) *Separation* of the iris from its ciliary attachment. This was generally known as *iridodialysis*, but sometimes called *iridorrhexis*.

(4) Simple *incision* of the pupillary margin, and of the free iris tissue. This has been designated *sphincterotomy* by some, and *coretomy* or *iritomy* by others. Either one of the latter terms is to be preferred, because it is more clearly descriptive.

(5) *Detachment* of the synechiæ at the pupillary margin, either anterior or posterior, thus allowing the pupil to retract. This was known as *corelysis*.

(6) *Strangulation* of the prolapsed iris in the corneal incision was called *iridencleisis*. The prolapse was sometimes tied with a ligature.

(7) *Trephining* of the iris-membrane, by passing a small trephine or punch through a corneal incision.

(8) *Section* and removal of a portion of the sclerotica and chorioid by knife or trephine, with replacement of the conjunctiva over this opening, the conjunctiva thus acting as a substitute for the cornea in transmitting light. This was called *sclerectomy*.

(9) *Transplantation* of the cornea for total leucoma. This was usually preceded by partial or complete trephining of this membrane.

In addition to these nine distinct methods certain combinations of these have been described and successfully practiced:

(10) *Division* and *excision* have frequently been performed together.

(11) *Separation* and *excision* have likewise had some vogue.

(12) *Separation* and *strangulation* have occasionally been practiced.

(13) *Detachment* of the synechiæ and *excision* have also been performed.

HISTORICAL REVIEW OF IRIDOTOMY.

In this brief review of iridotomy,[1] we shall confine our attention to the methods that have been advanced for the formation of an artificial pupil in cases of membranous occlusion of the pupil following removal of the lens, either by couching, extraction or discission, the iris-membrane in these cases being chiefly composed of inflamed iris tissue glued down by retro-iridian exudate to the thickened lens capsule.

The early history of iridotomy shows that the advocates of this operation were divided into two schools, (1) those recommending the use of the *knife-needle* for incising the iris-membrane, and (2) those adopting the method of introducing *scissors* through a previously made corneal section and freely incising the iris-membrane, or excising a portion of the same. We will first consider the school which advocated incision by the knife-needle.

I. KNIFE-NEEDLE METHOD.

Cheselden,[2] a renowned surgeon, and oculist to Her Majesty, Queen Caroline of England, first announced, in 1728, his success in making an artificial pupil by means of his knife-needle. He made his puncture back of the corneoscleral junction on the temporal side, passing the knife across the posterior chamber, and making a counter-puncture in the iris-membrane near the nasal margin. He then cut through the iris from behind forward as he withdrew the knife, the incision being carried through two-thirds of its ex-

1. Wagner, Karl Wilhelm Ulrich: Inaugural Thesis, Göttingen, 1818. He invented the designation Iridotomia, which he formed from the original Greek, ἶρις, ἰριδος (the iris) and τομή (cut).

2. Cheselden, William: Philosophical Transactions, London, 1728, xxxv, p. 451.

tent. The pupillary opening thus made was a long oval slit, horizontally placed. He has reported two successful cases[3] (Figs. 1 and 2), occurring in patients who had previously undergone couching of the lens. His instrument, strange to say, was practically of the same general shape as the Hays knife-needle, but was larger,

Portrait of William Cheselden, 1688-1752. Painted by Richardson.

and judging from the description more clumsily constructed, as there was danger of leakage of the aqueous and sometimes of the vitreous when it was used. Its form resembled a combination of a bistoury and a sickle-

3. Ibid, abridged, vii, pl. v, Figures 2, 3 and 5.

shaped knife, having a sharp edge on one side, a rounded back, and an acute point. We possess two good illustrations of this knife-needle, one by Cheselden himself (Fig. 3), and the other by his pupil, Sharpe[4] (Fig. 4).

For more than a century the method of Cheselden seems to have been the storm center of controversy. Some doubted his veracity, others essayed his operation but failed, while a few had a moderate degree of success.

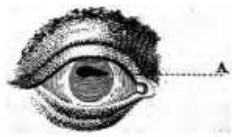

Fig. 1.—Original case of iridotomy. Iris incised above (Cheselden).

Fig. 2.—Second case of iridotomy. Iris incised below (Cheselden).

Many attributed to him statements which do not appear in his published report. He says clearly that in each of his cases couching had previously been performed, and yet some have insisted that the lens was present, and must have been wounded. He also states that his incision was made from behind forward, and yet his followers, Sharpe[4] and Adams,[5] both describe the incision as being made from before backward. As Sharpe was

Fig. 3.—Original knife-needle in situ, behind the iris (Cheselden).

his pupil, and presumably had seen him operate, Guthrie[6] suggests the possibility of his having made his incision both ways, the technic being practically the same.

4. Sharpe, Samuel: A Treatise on the Operations of Surgery, London, 1739, p. 169.

5. Adams, Sir William: Practical Observations on Ectropium, Artificial Pupil and Cataract, London, 1812, p. 37 et seq.

6. Guthrie, G. J.: Operative Surgery of the Eye, London, 1830, p. 428.