

## ON SCLEROTOMY IN DIFFERENT FORMS OF GLAUCOMA.\*

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In the latest publications on the cure of glaucoma by sclerotomy (Mauthner, Jany), I have been reproached for not having upheld with more vigour an operation of which I am the originator. Great surprise has been created, especially by a passage in my *Thérapeutique Oculaire*, in which, addressing young surgeons who had not yet entered upon practice, I advised them to confine themselves to iridectomy, until some daring operator should succeed in demonstrating that we ought to give the preference to sclerotomy, and above all until it had been established upon practical grounds in what forms of glaucoma sclerotomy should be preferred.

Mauthner has already in part commenced to supply this demonstration. But while he proposes the almost absolute substitution of sclerotomy for iridectomy in the treatment of glaucoma, I have thought it right to advance towards this change of practice by selecting cases in which sclerotomy could be performed with facility, and then those in which it presented evidently fewer dangers than iridectomy, and finally cases in which the new operation offered serious advantages as regards the optical result, whilst at the same time it displayed not only an efficacy analogous to that of iridectomy, but even an incontestable superiority under certain circumstances.

The great object was to allow the new operation to become ripe, in order that it might be able to take the place of the old one from which it originated, and which has been a true blessing to humanity, although its results have not always been satisfactory, and in some exceptional cases have even been most unfortunate.

I commenced accordingly by substituting sclerotomy for iridectomy in cases of absolute glaucoma with atrophy of the iris, where the latter operation would have been illusory. In the second place, I thought sclerotomy might be preferred in the hæmorrhagic forms of glaucoma, precisely where the discoverer of the operative treatment of glaucoma himself had feared to recommend his operation, so disastrous did the results show themselves.

Since the recommendation in my *Thérapeutique Oculaire* (page 386) above referred to, I have experimented with sclerotomy upon a large scale, and I have gradually extended its indications, so as sensibly to have approached the wise opinions of Mauthner. But still I have always selected cases in which the substitution of sclerotomy was justified by the obstacles to iridectomy, which obstacles were obviated by the new operation.

In my *Chirurgie Oculaire* (page 221), I recommend sclerotomy in the following conditions. 1. In the incipient stage of glaucoma when, between the attacks, vision is normal. There is no doubt but that the formation of an artificial pupil in such eyes, even when completely successful, gives rise to an imperfect optical apparatus, causes dimness, and frequently astigmatism; and the patient, comparing the vision left him after the operation and that which he previously enjoyed, is always more or less discontented, although he may possess a central acuity of vision which is perfect. 2. In cases of simple glaucoma, in which both central and peripheral vision are nearly normal. The same considerations as to the deteriorating action of iridectomy are equally applicable here. 3. I recommend recourse to sclerotomy when, in simple glaucoma, the margin of the visual field, even at one side only, touches slightly or comes very near to the point of fixation. Every clinician is aware that in such cases the iridectomy is very frequently followed by a further diminution in the field of vision, which may deprive the patient of central vision, a danger not to be feared with sclerotomy.

I shall not here speak of congenital hydrophthalmia—the glaucoma of children—which constitutes the fourth indication mentioned in the *Chirurgie Oculaire*, as I wish to confine myself to the treatment of the ordinary forms of glaucoma.

Having up to the present time treated a very large number of cases by sclerotomy, I think it is possible to give to the indications for the operation all the desired precision. I am of opinion, in short, that in every form of chronic simple glaucoma, in which the results of iridectomy have been much less brilliant than in the irritative forms, iridectomy should be definitely given up and sclerotomy exclusively employed. This important substitution appears to me justifiable, not only because sclerotomy possesses, according to my experience, a greater efficacy in such cases, but also because the proceeding is free from some inconve-

niences which, in a certain number of cases, have been observed to attend iridectomy.

By degrees I have succeeded in extending also the use of sclerotomy to cases of irritative glaucoma, in which the use of myotics transforms the disease into the simple form, and where well-marked myosis is produced by eserine. According to this statement, iridectomy would for the present be reserved solely for attacks of acute glaucoma, and for irritative forms in which the tension is such that the myotics do not produce any effect, or but an imperfect one. It will be noticed that these are precisely the cases in which an exact performance of sclerotomy would present great difficulties, and where, on the other hand, as in attacks of acute glaucoma, the most imperfectly performed iridectomy may prove efficacious.

As Schweigger has observed, we have in the use of eserin—several instillations of which should precede each glaucoma operation—the means of deciding upon the method which is to be preferred in each case. On any glaucomatous eye in which eserin acts well, sclerotomy should be performed; but on any eye in which the effect is not complete, and on which even the prolonged use of the myotic does not modify the form of the glaucoma, it is desirable to have recourse to iridectomy.

In order to form an opinion as to the curative effect of sclerotomy, it is necessary that it be most accurately performed. With regard to this point, I shall not deny that if the anterior chamber be shallow (which need not prevent the perfect action of the eserin), this operation might present some difficulty, whilst iridectomy would be more readily performed. But I am so convinced that it is sclerotomy which in such cases will in future be demanded, that I do not fear but that routine and a greater operative facility will here also give sclerotomy the position it deserves.

In all the sclerotomies which I have lately performed, I have used a narrow Gräfe's knife, which I found more suitable in cases of shallow anterior chamber than the sclerotomy which I formerly recommended. Moreover, as also Mauthner has recommended, I do not confine myself strictly to the formation of a flap two millimètres high, of which the middle third is left undivided. But, especially if the depth of the anterior chamber permit it, I form a flap of from three to four millimètres high. The knife should penetrate the sclerotic very precisely at a distance of one millimètre from the clear cornea, and then, the blade being held perfectly parallel to the plane of the iris, it should be passed very slowly in front of the latter, so that the counterpuncture may fall also exactly at a distance of one millimètre from the internal border of the cornea. If the blade be not held quite parallel with the plane of the iris, there is danger that it may pass through the cornea, and that the sclerotomy may be but half performed; or, if it be directed too deeply, it may come out through the sclerotic at an exaggerated distance from the cornea, may wound the ciliary body, and may provoke troublesome hæmorrhage and irritative symptoms of an alarming kind. A complete curative effect should not be expected from sclerotomy unless it is performed strictly *lege artis*; and, in order that this may be, it is necessary that the operator should have the proceeding at his fingers' ends. I would like every practitioner to be convinced that it is only after a certain apprenticeship that good and precise sclerotomies can be performed. The section should be made by slow sawing movements, leaving exactly one-third of the flap undivided.

Before giving the results obtained by this operation, I wish to draw attention to the difference which exists between sclerotomy and simple paracentesis or puncture of the sclerotic, as Mackenzie performed it or recommended it. In an eye upon which sclerotomy has been precisely performed, the anterior chamber is not reformed until the fifth or sixth day, and often still later, although a bandage be kept applied to the eye; while, as we know, the aqueous humour is collected very rapidly after simple paracentesis.

Without any cystoid cicatrix having been formed, the subconjunctival tissue remains often œdematous for a long time, and the neighbourhood of the wounds especially remain swollen. Moreover, I have observed that in some eyes on which very large sclerotomies had been performed, with flaps of from three to four millimètres in height, and also in cases where the uncut bridge had been very narrow, the cornea presents depressions close to its margin and in front of the incisions. This sinking in of the corneal tissue gives very much the appearance of ulcerative facets, but differs from the latter in the dryness which the epithelium presents. The nature of these appearances is evidently not such as to make me abandon my opinion as to the curative action of sclerotomy; on the contrary, they confirm me more and more in the idea that it is the increased facility which is given to the process of filtration that is to be regarded as the chief factor.

In describing the results which I have obtained from sclerotomy, I am especially anxious to point out in what way they differ from those of iridectomy. In the first place the new operation admits of much

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greater freedom in the after-treatment. The patients being provided with a bandage, may return home, and can, for the most part, resume their occupations upon the second or third day afterwards.

Having examined the acuteness of vision of the greater number of my patients upon the day following the operation, and the field of vision two or three days afterwards, I am in a position to state that an improvement was evident in most cases, and that in no instance was there a deterioration of vision. In one case,\* where I had to deal with a chronic irritative glaucoma, which, when the other eye was found affected with retinal apoplexies, was recognised as of a hæmorrhagic nature, the vision after the sclerotomy was found considerably diminished in consequence of a hæmorrhage situated at the macula lutea; but yet this disturbance of vision was of short duration only.

When, after sclerotomy, the anterior chamber is only slowly re-established, an alteration in the refraction of the eye may be observed, owing to displacement of the crystalline lens; but we have not found astigmatism to become developed, as often happens after iridectomy, putting the patient in a very uncomfortable position. In short, sclerotomy, except for a slight transitory change in the refraction, leaves the operated eye absolutely intact, with but a short period of irritation.

I mention, in my *Thérapeutique Oculaire* (page 383), the case of a medical man upon whom I performed sclerotomy for simple chronic glaucoma, which had damaged his vision so much that he was unable to count fingers at more than a *mètre* and a half (nearly five feet). The defect in the field of vision at the inner side approached close to the point of fixation. This operation was performed in November 1877, and I had an opportunity of observing its effect in May 1879, when the patient came to request that I would perform the same operation upon his other eye, although it possessed perfect acuteness of central vision and an unblemished field of vision. Believing that he had felt some premonitory signs of glaucoma in the second eye, he wished to have the sclerotomy performed in order that he might leave Paris without fear. I could not refuse him this operation, for, in the eye which had already been operated on, there was an enlargement of the field of vision and an improvement in the central vision, fingers being now counted at two *mètres* and a half (eight feet and a quarter). This patient's case allowed me to satisfy myself again how very little visual trouble is caused by sclerotomy, for the sight was absolutely good from the second day after the operation.

Since the commencement of the year 1879, I have performed forty-eight sclerotomies, most of which have been noted with great care by Dr. Manversen of Bucharest in an essay on the subject. These numerous operations confirm me in the opinion already expressed—namely, that in the various forms of chronic simple glaucoma, sclerotomy is not only as efficacious as iridectomy, but that it is far superior to the latter, being free from the disagreeable effects of the excision of a portion of iris.

## TOBACCO AND ALCOHOL AMBLYOPIA.†

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WHEN I was in London, two years ago, I saw and heard what I had learnt before by reading, that a greater amount of amblyopia and amaurosis was attributed to the abuse of tobacco in England than on the Continent, and particularly more than with us in Germany.

In my account of my London tour, published in 1877 (*Deutsche Medicin. Wochenschrift*), I suggested that it would be very useful to submit this important difference between English and Continental views to discussion at an international ophthalmological congress. It therefore affords me much gratification to have the opportunity, by the kind request of your secretaries, of opening a discussion on this interesting subject at the Annual Meeting of the British Medical Association.

Tobacco amblyopia was discovered by Mackenzie of Glasgow, and much attention has been paid to the subject in England; the original term, tobacco amaurosis, being still retained by some authorities. It is true that English authors differ widely in the share which they attribute to tobacco by causing failure of sight. For instance, in the admirable treatise of Mr. Soelberg Wells (1869), we find the following passage. "I fully admit the fact, that the excessive use of tobacco (but most frequently together with other causes) may produce considerable impairment of vision, and finally.....even atrophy of the optic nerves." But I cannot, from my own experience, accede to the doctrine, that there is

anything peculiar in the form of atrophy of the optic nerve.....I believe that, in the commencement of the amblyopia of smokers and drunkards, the disturbance of sight is at first only functional.....But if the cause persist, the disease passes over into an organic lesion." Mr. Brudenell Carter, who formerly passed some considerable time amongst a people—the Turks—who smoke almost without cessation, has expressed to me his grave doubts as to the existence of tobacco amaurosis. Mr. Jonathan Hutchinson, who for many years has bestowed great pains on the investigation of this subject, and to whom I am personally indebted for many remarks in connection with it, stated in his first paper (in 1864), that a peculiar form of amaurosis or atrophy of the optic nerves was caused by tobacco; but in his most recent paper (1876), based on a re-examination of a large series of patients affected with tobacco amblyopia, he states, that a large majority had quite recovered, and that scarcely anyone had become worse. Lastly, Mr. Nettleship published, two years ago, a series of fourteen cases of the amblyopia of smokers, in all of whom mere abstinence from tobacco was followed either by recovery or arrest of the disease. Notes on the diagnosis of tobacco amblyopia by Mr. Nettleship appear in the volume of *St. Thomas's Hospital Reports* for this year, and contain full details of twenty-three cases.

The influence of tobacco upon sight has also for many years been to some extent admitted in Germany, and more freely in France by Sichel and Galezowski (*Des Amblyop. toxiques*, Paris, 1879). A. von Graefe, in 1865, drew out very clearly the differences between progressive amblyopia with restriction of the field of vision, and curable amblyopia with normal periphery of the field but with a central defect (central scotoma). He considered that excessive indulgence in alcohol, much smoking of strong cigars, debauchery, abdominal obstruction, irregular sleep, and overwork of the eyes, might act singly, but far more often acted together, in producing amblyopia; and that it was difficult to estimate the etiological value of the different factors. He goes on to say that the much greater frequency of amblyopia in men than in women has suggested the opinion that smoking is a principal cause. But since many other influences, injurious to the nervous system, act far more on men than on women, he concludes that excessive smoking is to be regarded as constituting only one element in the production of amblyopia. For some years, these statements of von Graefe were fully admitted in Germany, and the papers of Professor Horner of Zürich and of his pupils Erisman and Schön, and of Professor Leber, now of Göttingen, were all based upon von Graefe's ideas. Considering that an immense number of men smoked regularly without damage, and that cases of benign centric amblyopia in workmen addicted to the abuse of alcohol were very common, there was a proneness in Germany to attribute the symptoms principally to the alcohol, and to admit pure tobacco amblyopia only in those cases where there were also clearly marked symptoms of chronic nicotin poisoning. Both forms of amblyopia, that from tobacco and that from alcohol, seemed to us very similar in their clinical symptoms as well as in their prognosis. Both were generally known under the same name of amblyopia from intoxication, or toxic amblyopia, even in my own earlier statistics published by my late assistant, Mr. Pufahl, now in Paris. A real progress was made in Germany by Förster, who published a short abstract in 1868, and a full monograph on this subject in 1876. He points out that the existence of tobacco amblyopia is fully proved *ex juvantibus*, if passionate smokers who become amblyopic are found to improve in sight after having relinquished their excessive use of tobacco. He also shows that the amblyopia of both eyes, which interferes with the reading of small print, depends upon a central scotoma, or dull, or even dark, region in the middle of the field of vision, which reaches from the fixation point to Mariotte's blind spot; that within this region the perception of red is especially defective; and that the periphery of the field remains normal. Förster states that this form of amblyopia is characteristic, but not pathognomonic; it occurs in almost all cases of tobacco amblyopia, but also in some others. The ophthalmoscope shows a normal fundus, but the papilla is palish. The patients, all males, are from thirty-five to sixty-five years old. A sedentary life, want of sleep, and bad appetite or bad nutrition, are the co-operating causes. Progress of the disease to complete atrophy of the optic nerves is very rare. A central defect in the field of vision may be permanent, but generally the patients recover if they can give up smoking. He considers that the morbid process is localised in the optic nerves, not in the brain.

In supplementing this brief historical abstract by a short statement of my own views, I would say that I have, in common with most other observers, found the fundus normal in the early period of tobacco amblyopia, whilst after some time the outer quarter or half of the disc grows gradually rather pale. In the diagnosis of this disease and of similar cases, we should not overestimate the value of ophthalmoscopic examination, but rely rather on an exact examination of the whole retinal function. The field of vision of a normal eye in steady fix-

\* I might mention the case of a medical man affected with insufficiency of the aortic orifice, who was operated on for attacks of glaucoma, and on the day after the operation saw his patients, but on the fifth day a copious hæmorrhage took place into the anterior chamber.

† Read in the Subsection of Ophthalmology at the Annual Meeting of the British Medical Association in Cork, August 1879.