ON RESULTS OBTAINED BY TOTAL CONJUNCTIVAL HOODING OF THE CORNEA FOR SERPIGINOUS ULCER

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It is more than 5 years since I introduced a new surgical proceeding for treatment of serpiginous ulcer. The results are so satisfying, that it seems to be worth while to call attention to it.

The operation was devised in 1927 for a case of intractable Mooren's ulcer, and published in 1933, having healed three cases of this so far incurable disease.

The proceeding consists of covering the whole cornea by a conjunctival flap, instillation of cocaine and subconjunctival injection of novocaine and adrenalin in order to raise the bulbar conjunctiva. The bulbar conjunctiva is detached by circumcising it all around the limbus. It is undermined into the upper fornix.

After having scraped the ulcerated parts of the cornea with a Meyhöfer spoon, the round hole in the conjunctiva is united by "anchoring" cat-gut sutures in an almost horizontal line below the cornea.

"Anchoring" means the sutures take up some episcleral tissue. We put in the first suture at 6 o'clock. After having passed the needle through the upper conjunctival edge, we grasp the inferior rectus (in order to fix the eye-ball), then take up some episcleral tissue horizontally 3 mm. below the cornea and bring the suture out through the lower edge of the conjunctiva. It is advisable to use a corneal needle. Thus the line of suture is fixed below the cornea, an important condition of the success, as this is the only way to ensure against spontaneous reopening of the wound.

In cases of Mooren's ulcer the cornea remained covered one year. Then a little hole was made into the middle, behind which the clear cornea reappeared and the patient could see again.

I was led to this solution by the inefficacy of Kuhnt's partial conjunctivo-plasty. The partial hooding always retracts too quickly before a firm coalescence between conjunctiva and flap could have taken place. The ulcerated margin reappears in a few weeks and the disease progresses further.

One of my assistant-surgeons seeing the satisfying results of Mooren's ulcers, proposed in 1940 to try the proceeding in refractory

cases of serpiginous ulcer too. Two years later we were able to publish already the results of 25 cases. Since that time this proceeding is a systematic method of my clinic. As far as I know, it has not yet been accepted elsewhere, except by Lawaetz, who reported 6 successful cases in the Danish Ophthalmological Society in the year 1943. Although Meisner mentions it in the recent German text-book of ophthalmic surgery edited by Thiel (1942, p. 242), there are misunderstandings in the text as well as in the figure and it is evident that he has never tried it.

In the numerous publications on serpiginous ulcer since that time I could not find any other reference to this procedure. What I cannot find surprising is the serious objections quoted against it. *Ubi pus, ibi evacua*, says the old rule, and we act plainly contrarily. Every further treatment, even the control of the ulcer is made impossible by the covering, and—if only temporarily—we deprive the eye of its remaining small vision, creating at the same time a disadvantageous situation from the cosmetic point of view.

We can set against all these drawbacks one advantage, the saving of an eye, or rather, the saving of vision, that would have been lost by any other treatment. Of course it would outdo all objections, if this could be proved.

There are only two particulars that can be made subjects of enquiry; the visual acuity before and after treatment, and the duration of medical attendance, expressed in the days of hospitalisation.

The total hooding is superior to our own medical treatment. Further comparisons cannot be made on the simple ground that in the whole ophthalmological literature there do not exist records or statistics on serpiginous ulcer comparable to ours.

Our medical (conservative) treatment is the well known general treatment of serpiginous ulcer, always adapted to the case. It consists of heteroprotein injections, administration of sulphonamides, instillation of zinc sulphate, optochin, silver compounds, atropine, and the well known treatment of Eperon, *i.e.*, painting the ulcer and its advancing margins with 20 per cent. zinc sulphate solution. An infected lacrimal sac is removed. For hypopyon, paracentesis of the cornea is done. Of course we used largely all propositions available in our 30 years of practice, *i.e.*, various forms of cauteries, iontophoresis, trepanation of Sonderrmann, chemotherapeutics as rivanol, trypanflavin, vetol, etc., without any convincing success.

As we have to-date 56 cases treated by full conjunctival hooding, in the following tables we compare these with twice 56 cases of the preceding period treated conservatively in the described manner. The basis of comparison is visual acuity and hospitalisation.

TABLE I

Fifty-six cases of serpiginous ulcer treated conservatively during the period 1935, 6 April—1938, 4 April.

Number	V at beginning	V at end	Days of treatment
1	0	0	15
2	0.1	0.1	10
3	0.1	0	25
4	12	20	8
5	0.1	0.1	7
6	0.1	0.1	24
7	2	2	10
8	0	0	24
9	0.1	0.1	9
10	1	1	11
11	30	30	10
12	12	12	7
13	0.1	0.1	15
14	20	20	8
15	0.1	10	8
16	0.1	0.1	15
17	6	25	19
18	1	15	16
19	0.2	0.2	17
20	0.1	40	7
21	0.1	6	7
22	0.1	0.1	15
23	0	0	13
24	0.1	0	32
25	0.2	0.1	6
26	1	0	8
27	6	15	4
28	0	0	20
29	0.1	0	20
30	0.1	0.2	23
31	0.2	4	7
32	0.1	0.2	11
33	0	0	27
34	0.1	0	22
35	0.1	1	10
36	1	1	7
37	3	12	10
38	6	12	12
39	15	15	9
40	2	10	5
41	0.1	0.2	9
42	0.1	0.1	11
43	0.1	0.1	14
44	0.2	20	10
45	0.1	0.1	19
46	20	25	12
47	6	1	18
48	4	10	10
49	1	15	9
50	3	15	12
51	5	8	5
52	3	6	16
53	2	5	8
54	0.1	3	6
55	20	40	87
56	0.1	0.1	24

TABLE II

Fifty-six cases of serpiginous ulcer treated conservatively during the period 1938, 6 April—1943, 10 August.

Number	V at beginning	V at end	Days of treatment
1	0.1	8	22
2	3	15	48
3	0	0	10
4	1	15	4
5	1	2	17
6	0	0	29
7	0.1	0.1	28
8	0.1	0	23
9	0.1	0	27
10	0.1	0.1	12
11	0.2	12	8
12	0.2	15	7
13	0.1	0.1	27
14	1	10	9
15	0.1	0.1	27
16	6	8	6
17	0.2	2	19
18	0.1	1	27
19	0.1	0.1	7
20	2	4	10
21	0.1	0.1	22
22	0.1	0.1	21
23	0.1	1	9
24	0.1	15	5
25	0.1	0.1	18
26	1	1	6
27	0.1	2	6
28	1	1	13
29	0.1	0.1	11
30	6	6	6
31	0.1	0.1	11
32	0.1	0.1	23
33	0.1	0.1	28
34	0.1	0.1	10
35	0.1	5	8
36	0.1	0.1	12
37	0.2	25	11
38	0.2	0.1	18
39	0.2	6	6
40	0.1	8	10
41	0.1	12	11
42	15	15	3
43	0	0	27
44	0	0	33
45	0.1	0.1	8
46	15	15	11
47	0	0	17
48	1	1	10
49	0.1	0.1	17
50	1	1	11
51	2	2	5
52	0.1	0.1	11
53	0.1	6	6
54	0.2	6	7
55	3	12	9
56	0.1	0.1	11

TABLE III

Fifty-six cases treated by full conjunctival hooding of the cornea during the period 1940, 4 August—1943, 30 August.

Number	V at beginning	V at end	Days of treatment
1	0.1	2	5
2	0.1	0.1	6
3	3	20	4
4	0.1	12	7
5	0	0.5	4
6	0.1	1	6
7	0	15	4
8	0	3	5
9	0.1	0.1	5
10	0.5	25	5
11	0.1	6	5
12	0.1	8	6
13	0	6	7
14	0	0.2	8
15	0.1	8	6
16	0	8	5
17	0	0.1	5
18	0.1	0.1	4
19	2	2	6
20	0	0	7
21	0.1	10	5
22	0	2	4
23	0.1	15	6
24	3	6	5
25	2	4	6
26	4	8	5
27	0.1	3	6
28	0	0.1	5
29	0.1	0.1	7
30	1	2	5
31	0.1	10	6
32	0	15	5
33	0	0	13
34	0.1	6	6
35	0.2	3	5
36	0.1	0.1	6
37	2	25	4
38	0	0	6
39	1	30	7
40	0.1	10	5
41	0.2	8	9
42	0.1	0.1	5
43	0	6	7
44	0.1	12	5
45	3	20	6
46	0.1	1	6
47	0.2	12	7
48	1	20	5
49	0.1	2	4
50	0	3	8
51	0.1	0.2	5
52	3	3	5
53	0.2	4	7
54	1	25	5
55	0.1	4	6
56	0.1	15	5

To the reading of the tables it has to be mentioned, the visual acuity is recorded in oxyoptries of Blaskovics, as it renders the statistical and comparative discussion of this value very easy. For the rest it is easy to turn from oxyoptry to the current expression of d/D : one has only to make a division by 60, *e.g.*, 3 oxyoptries = $3/60$; $60/o = 60/60 = 6/6$. (The sign of oxyoptry is $/o$).

Lack of light perception is recorded by 0; light perception is similarly recorded by 0, as $1/\infty = 0$, and its practical value is 0 too; hand-movement is recorded by 0, $1/o$; counting fingers before the eye 0, $2/o$. (It is to be born in mind, this 0, 1 and 0, 2 does not mean one tenth vision, but one tenth oxyoptries).

We find the following facts by simple calculation in the tables.

The 56 cases of Table I sum up to 147, $1/o$ of visual acuity at the beginning of the treatment; finally round 400/o. Out of every 100/o there became 270.

In the second table this sum total is only 38,9 at the beginning; finally it has grown up to 233,9/o. From every 100/o became 600.

The average of the added two tables says that by conservative treatment we could raise every 100 oxyoptries to 435.

In the third table we could not start with the visual acuity on admission, as we tried generally first the conservative treatment, and operation was only proposed in a progressive case (except serious cases with very low sight at the beginning of the treatment). Hence the second row shows the vision before the intervention. The sum total is only 29,7 /o, that was raised at last to 411,7 /o; in per cent, this would say that every 100 /o became the relatively enormous sum of 1386,2 /o.

But there is arising again a difficulty in not allowing the values to be compared directly. The final visual acuities of Table I and II are recorded on discharge from the clinic, while those of Table III 6-8 months later, after having removed the covering from the cornea. It is very probable, that after the lapse of half a year the vision of the first and second groups improved appreciably also. As we do not work with exact values, and we intend only to avoid a generally erroneous conclusion, we try to eliminate this difficulty by presuming a further improvement of 100 per cent. in the first and second tables and only of 10 per cent. in the hooded cases.

So in conclusion we might state we could augment 100 visual units to 870 by conservative treatment, and to 1,524 units by the total hooding; hence the superiority of the latter seems to be well proved.

There are still some further comparable points regarding vision, *e.g.*, the number of cases improved, worse, and unchanged.

TABLE IV'

	Improved	Worse	Unchanged
In Table I	27	7	22
In Table II	26	4	26
In Table III	45	1	10

Further we can pick out the cases when qualitative vision recovered as far as quantitative, that means light perception became again at least finger-counting.

TABLE V

In Table I	...	...	...	...	0
In Table II	...	...	...	...	0
In Table III	...	...	...	...	12

The contrary is similarly instructive, namely, how often qualitative sight turned into quantitative or less, that is, how often the sight has been lost.

TABLE VI

In Table I	...	...	...	...	5
In Table II	...	...	...	...	3
In Table III	...	...	...	...	0

From Table V we could deduce as a rule, that whenever a patient has a vision of not more than 1/0, it is only the total hooding that promises still some small serviceable sight at all.

Table VI is instructive too; it seems to show that the hooding secures us against full visual loss whenever the operation was not made too late. If panophthalmitis is present, restoration of the sight naturally cannot be hoped for any more.

The duration of the hospitalization is much in favour of the hooding. The conservative treatment required averages 14 days, the hooding on the other hand only 6 days. And in these 6 are also included the cases with extirpation of the lacrimal sac, sometimes with inevitable suppuration lengthening the treatment to 8-9 days. Eliminating these cases there remain only 4 days. To these have to be added the 3 days at a later date when the patient returns for removal of the hood.

But these data convincing as they may be, it is the clinical observation that remains conclusive for the surgeon. Pain, lacrimation, irritation, oedema all disappear a few hours after the operation, showing the instantaneous effect of our intervention. The wound of the conjunctiva heals shortly, and the patient leaves hospital though not seeing, yet with the feeling of being healed.

And what I believe to be the most important point in the whole proceeding, the surgeon himself no longer has that annoying feeling of observing a serpiginous ulcer progressing inevitably from day to day under his care.

The time of re-opening has to be set at least 6 months after the operation. Although the healing process begins at the moment of the covering, the pneumococci remain still alive for a time, probably with gradually decreasing virulence. Would we re-open the hooding,

say 2 weeks later, the ulcer would inflame again, and we would be compelled to cover the cornea again, as has happened. Even 2-3 months later we have seen a weak relapse with a small hypopyon for a few days. As far as our observations go, the interval of at least 6 months has to be kept. It is surprising, how willingly our patients wait, till the set term is over.

The re-opening is a simple procedure. We lift the conjunctiva somewhere on the cornea, make a hole in it through which we introduce the scissors and cut away the flap all around inside the limbus. The parts grown together are detached as a pseudopterygium by iris-spatula and keratome. One has to take care not to leave a thin capsular layer on the cornea. The eye is dressed for 1 to 3 days.

Encouraged by the satisfactory results, recently we have begun to extend considerably the sphere of application of the total hooding, *i.e.*, to all acute and chronic keratitic processes unhealed or not healing well, such as ulcerated and degenerated pannus, ulcus destruens, herpes corneae, kerato-mycosis, neuroparalytic keratitis. Once we applied it to an enormous exophthalmos in Graves' disease with excellent result.

Thus the total conjunctival hooding of the cornea became at my clinic an increasingly employed proceeding for keratitic processes and it is my firm conviction that we can save eyes by it, that would be otherwise inevitably lost.

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LOCAL SULPHONAMIDE THERAPY OF DENDRITIC ULCER*

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IN the early days of sulphonamide therapy Kleefeld (1938) recorded favourable results from the general administration of the drug in six cases of dendritic ulceration and in twenty cases of corneal herpes. Schmid and Saubermann (1942) likewise obtained satisfactory results in five out of twenty-one cases of herpes corneae. Most

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