INTRA-CORNEAL INJECTIONS OF CYANIDE OF MERCURY IN TRACHOMATOUS PANNUS

BY

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WHILE trachomatous pannus is classically said to retrograde by proper treatment of the lids, improvement in severe cases is obtained only after long-continued treatment during which time many patients get discouraged. In eye dispensaries where patients are numerous and poor, a speedy relief of the pannus would be much appreciated. It is with this object that I have used intra-corneal injections of cyanide of mercury in trachomatous pannus with the purpose of creating a therapeutic chemical reaction.

I have not seen this operation performed elsewhere nor does the available ophthalmic literature make mention of such a treatment. The injection of cyanide of mercury subconjunctivally in trachomatous pannus is highly recommended by Cuenod and Nataf¹ as well as others, and in hundreds of cases I have used it with satisfactory results. Rollet² injected intra-corneally drugs and dyes on animals and patients, but "insufficient work was done to determine the effect of drugs so injected."

I have treated 25 cases of severe pannus rebellious to previous treatment by intra-corneal injections of cyanide of mercury with the following technique:—

Under local anaesthesia of 1 per cent. pantocain an eye speculum is introduced, a 1 c.c. record syringe containing 0.5 c.c. of 1 in 1,000 cyanide of mercury:

Cyanide of mercury ...	...	0.02
Novocaine ...	...	0.20
Aqua Dest. ...	...	20.00

is fitted with a very fine needle (the finer the better). The patient is asked to look downwards and with the eye of the needle turned towards the cornea the needle is introduced tangentially into the corneal substance about 1 mm. from the limbus, usually in the upper part of the cornea where the pannus is thickest. After having made sure that the eye of the needle is within the corneal substance, a few drops of the solution are injected slowly. At once the cornea assumes a greyish opaque colour which spreads from the upper part of the cornea downwards, the extent depending upon the amount of solution injected. The needle is withdrawn, the speculum is removed and the eye may be left open or bandaged. The whole procedure is painless.

Post-operative Course

After an hour or so, a little pain may occur which can be combatted with 0.5 gm. of aspirin by the mouth, and hot fomentations to the eye. Some patients never complain of any pain, while in a nervous female patient the pain lasted six hours. The day following the operation pain usually disappears and the patient, just as in the case of subconjunctival injections of cyanide of mercury, is happy to notice that the lids feel lighter, but objectively in all cases I have noticed that the area of the cornea injected is more vascularized than previous to the operation, new conjunctival blood-vessels are seen running across from one side of the cornea to the other and in my first case I was afraid that I had exacerbated the pannus process, but experience with further cases makes me think that this increased vascularization is but a sign of a regenerative process.

The next two or three days, the pannus infiltration starts to clear, the trachomatous nodules that may have been present on the cornea begin to grow smaller, and in about 10 to 15 days, the pannus infiltration and the trachomatous nodules, as well as the superficial corneal ulcers that may have been present, disappear leaving the cornea clear except for a few blood-vessels running from the conjunctiva to the cornea. The patient feels much relieved, the visual acuity in all the cases treated is definitely improved, and in cases examined five to eight months after the operation, the cornea was quite free from pannus infiltration and even from the conjunctival blood-vessels running over the cornea.

Comments on the Technique

Where the pannus is thick and gelatinous the needle puncture causes a few drops of blood to ooze out. This gelatinous pannus is often friable and if the needle is not very fine repeated punctures may be required. The site of the puncture should be preferably in the middle of the pannus so that on injection the solution will spread all over the area covered by the pannus. One may start injecting the solution from about "10 o'clock" and continue injecting at the same time that the needle is being slowly pushed forward towards "2 o'clock." In some cases where the pannus involved all the cornea I have made "circular" injections in all the periphery of the cornea (case 2 below). Since the cornea is normally thinner in the centre than it is in the periphery (Terrien³), it is evident that the needle should not be thrust too deeply for fear of entering the anterior chamber. In no case, however, have I had such a complication. In one or two cases air was injected accidentally along with the solution intra-corneally, but this soon absorbed by itself.

As the aim of the injection is to produce a mild keratitis, I have sometimes dropped atropine into the eye after the injection is made but this is not indispensable. Where there is secretion, it is preferable not to bandage the eye, and even where there is no secretion I prefer not to bandage for fear of exciting the trachoma of the lids usually present.

Most of the cases treated were cases that have been suffering from pannus for years in spite of local measures followed by the patients more or less regularly. To determine the value of the intra-corneal injections *per se*, the lids were not treated nor any other method used in the first cases, and when the intra-corneal injections alone were found to be capable of clearing up the pannus, I combined the latter method with daily painting of the lids with 2 per cent. silver nitrate and free exhibition of argyrol 5 per cent. and methylene blue 0.25 per cent. drops and intra-muscular injections of ether benzyl-cinnamique (Shalom,⁴ Paris Thesis, 1932), and found the combination useful in hastening the improvement.

My first cases were hospitalized to be under constant supervision, but at present all cases operated upon are sent home and told to attend the eye dispensaries for daily painting of the lids.

Results

All the 25 cases operated upon continued receiving daily local treatment in the out-patient dispensaries. Examined two months later :—

1. Five showed a recurrence of the pannus (20 per cent.), but in a much milder form. They received intra-corneal injections again and examined four months later showed macroscopically clear corneae.

2. In three cases although the pannus infiltration had disappeared, two months after the operation, fine blood-vessels could still be seen running in the cornea.

3. Ten cases examined by the slit-lamp showed that the pannus had decreased quantitatively and qualitatively, but in all, trachomatous vascularization was still present.

The following are brief notes on two typical cases :—

Case 1.—S. N., male, aged 32 years; poor; physically rundown.

October 6, 1933. Bilateral thick pannus. Active trachoma of lids. Both corneae infiltrated, numerous blood-vessels running across in all directions. Minute superficial ulcers. Anterior chambers can hardly be made out. Patient practically blind. Visual acuity,

hand movements. Patient had been treated with the usual methods a few months at a time since 1923.

October 7, 1933. Intra-corneal injection, both eyes. Atropine; no bandage. Hospitalized.

October 8, 1933. Corneae extremely vascularized. Moderate pain one hour after operation lasting two to three hours. Aspirin (0.5 gm.) was given, but no other treatment.

October 10, 1933. Pannus beginning to clear up.

October 23, 1933. Pannus much less.

October 25, 1933. Corneae free from infiltration, a few blood-vessels still present. Visual acuity much improved (6/60). The lids were then painted daily with 2 per cent. silver nitrate. Twelve daily intra-muscular injections of ether benzyl-cinnamique (Jacobson's solution).

March 15, 1934. Corneae clear macroscopically. Slit-lamp shows several minute blood-vessels. Visual acuity, 6/36.

In this case the initial improvement was due to the intra-corneal injections, treatment of the lids having been started only after the pannus had almost cleared up.

Case 2.—B. Y., male, aged 20 years.

January 3, 1934. Right eye. Thick pannus covering all the cornea with marked perikeratic injection. Active trachoma of the lids. Visual acuity, counts fingers at 10 cms. Had received no previous treatment. Intra-corneal injection of cyanide of mercury made in the periphery of the cornea which was injected in five different places, all the cornea becoming cloudy except the centre. Not hospitalized. No other treatment given. Patient seen daily and on January 17, 1934, the cornea was free from the pannus, a few minute blood-vessels were present in the cornea. Visual acuity, 6/60. The lids were then painted daily with 2 per cent. silver nitrate.

May 1, 1934. Four months later, cornea clear of infiltration, few blood-vessels. Lid much improved.

In this case, in my opinion, ordinary treatment would have required at least three to four months to clear up the pannus, while the intra-corneal injection improved the condition within two weeks.

Summary

Twenty-five cases of severe trachomatous pannus, rebellious to other treatments, were given intra-corneal injections of cyanide of mercury 1 in 1,000. The method described is simple, safe and painless. In 15 to 20 days the pannus improved definitely. In 20 per cent. of the cases, recurrences occurred after a few months. While this method does not cure pannus radically, it affords a

safe, simple, painless, inexpensive method of combatting pannus rebellious to other treatment.

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 ANNOTATION

The Predominance of the Visual Centres in Anoetic Consciousness

One of the most remarkable discoveries among the electric concomitants of nervous activity was the discovery of Hans Berger in 1929, that if a human subject lies quietly with eyes closed and in a state of as complete mental rest as possible, rhythmic oscillations of electrical potential with a frequency of 10 per second can be observed in a circuit derived from electrodes applied to the head. This phenomenon has been amply confirmed and further investigated by Adrian and Matthews (*Brain*, Vol. LVII, p. 355, 1934). Berger attributed the response to activity of the cerebral cortex as a whole. Adrian and Matthews confirm the cortical origin, but prove conclusively that only the non-striate area of the occipital lobes is predominantly involved. The following summary in the author's own words will suffice to show that the original paper contains matter of quite startling interest:—

“The essential condition for the appearance of the Berger rhythm is that pattern vision should be absent. It develops when the eyes are closed or if the visual field is uniform, and disappears whenever the central part of the field has any detail. The attempt to see detail, even though the field is uniform, abolishes the waves; for this reason the closure of the eyes, by withdrawing the attention from visual phenomena, aids the development of the rhythm. Its frequency is not altered by changing the illumination of the field, and it is not abolished by the perception of light and darkness or by visual imagery. In patients who have been blind for some years we have not been able to detect any trace of the rhythm. As Berger has shown, non-visual activities which demand the entire attention (*e.g.*, mental arithmetic) abolish the waves; sensory stimuli which demand attention do so too.