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SACCHARINE SALINE INJECTIONS IN OPHTHALMIC PRACTICE.

(SODIUM BENZOYL-SULPHONIC.)

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During the past ten years so much has been written concerning the efficacy of subconjunctival injections, that it would seem hardly necessary—in fact, almost superfluous—to attempt to add anything to the already comprehensive literature on this subject, but the rather contradictory views held by so many competent observers regarding this method of therapy leads me to present the results of my own experience in this direction.

With but few exceptions, practicing ophthalmologists in general seem especially sceptical regarding this branch of ocular therapeutics. In support of this statement I take the liberty of quoting from a recent article by Charles Stedman Bull of New York City, entitled "The Present Status of Subconjunctival Injections in Ophthalmic Therapeutics" (*Medical Record,* July 18, 1903). After reviewing the history of the subject, he concludes as follows:

"A careful observation of my own cases, in which various solutions were employed, has not been able to convince me that subconjunctival injections bring about any more rapid or favorable results than other methods of treatment which we have hitherto employed for affections of the cornea, uveal tract or retina. In several cases of orbital cellulitis of an infectious character, however, I found that subconjunctival injections of a sublimate solution (1/1,000) did exert a very favorable and unusually rapid effect in hastening the suppurative stage, in reducing the dense infiltration of the

*Sodium saccharinate; sodium benzoyl-sulphonic-imid; sodium salt of saccharin.

orbital cellular tissue, and thus aiding in restoring the circulation of the strangulated parts.

"My own conclusion, based on observation of my own cases and a careful study of the literature of the subject, are that all reports of the beneficial effects of subconjunctival injections should be carefully criticised and compared with the results obtained by other methods of treatment before accepting them as of any real value."

With this I hesitate to agree, as my personal experience during the last ten years, and especially the last five, with the sodium saccharinate serves to fix the status of this form of therapeutics more favorably. That it is of value is, to my mind, beyond doubt; but the technic, as ordinarily employed, should be greatly modified.

The mercurial injections employed by Darier and the strong saline solutions used by other ophthalmologists I have found to be decidedly irritating, and in this way serve to defeat their best purposes. While in Paris in 1892 I had the opportunity of observing Darier employ subconjunctival injections of corrosive sublimate and seeing the high-grade inflammatory reaction and pain that followed convinced me that this treatment was only applicable in very rare instances. Subsequently, while visiting the Royal Infirmary of Liverpool, I observed the same treatment in the hands of Mr. Bickerton, with similar results, to the extent that Mr. Bickerton abandoned it. In October, 1892, I tried the treatment on five selected cases (two of iritis and three of specific choroiditis.) The alarming reaction in these cases discouraged my further use of the method.

From 1898 I employed saline solutions, varying from normal salt solution to 30 per cent. solutions. The strong solutions produced considerable pain, and their results in my experience were very disappointing. After a prolonged trial with the various drugs advised for this form of medication, I have rejected them all and now restrict myself to the use of the following solutions:

R. Sodii saccharat., gr. v, x and xv.
Aquæ destil., ℥ i.
M. Sig.: For subconjunctival injection.

As its advantages may be mentioned the absence of irritating and

deleterious after-effect and its ready absorption. The results following its use are undoubted, and the benefit prompt. The method by which these results are brought about is the same in all subconjunctival injections, and I take this opportunity to refer those interested in the subject in the experiments of Wessely,[1] undertaken to determine the physiologic action of these injections. The results of these experiments and the conclusions derived from them I believe are now generally accepted.

Having come to the conclusion, from practical experience, that only a few substances (the best of which are saccharine salt solution and normal salt solution) are applicable to subconjunctival therapy, I have extended my line of experiements to all classes of ocular disease excepting glaucoma, cataract and conjunctivitis, with a view of determining the field for which this form of medication is best adapated. In consequence, I have found only a few of these diseases responded, but in these the response was prompt and undoubted. These conditions were *vitreous opacities, interstitial keratitis* and *corneal opacities.*

The number of injections necessary were on an average nine, one injection being made every three or four days until two injections are given, then once a week. An aseptic technic was employed. The conjunctiva was anesthetized by means of a few drops of a 4 per cent. solution of cocain; at the end of five minutes the solution was injected beneath the conjunctiva by means of a glass Pravaz syringe (an ordinary hypodermic syringe may be substituted), 10 to 20 c.c., with a gold needle, the lids being held apart by means of an eye speculum. The entire contents of the syringe (20 c.c.) were used in the majority of the cases, and the eye dressed with a compress saturated with an antiphlogistic lotion. The bleb surrounding the cornea formed by the solution seldom lasted longer than three-quarters of an hour, and the bandage was removed at the end of two or three hours. Most of the cases were walking patients. A few sensitive individuals were kept in the hospital for twenty-four hours. Absolutely no irritation or bad after-effects followed this procedure.

In iritis, this method was employed in conjunction with other

1. Fox: Diseases of the Eye, Lancet, April 4, 1903, p. 187.

forms of treatment, but the improvement here was not certain or lasting. In partial retinal detachment, its benefit was only temporary. In this disease I attributed the benefit to the clarification of the vitreous. In corneal ulcer, while devoid of dangerous results, it seemed greatly inferior to the other methods I employ in this condition, although I felt that the injections aided the medication, especially where there was much keratitis.

However, a clear understanding of its capabilities should be borne in mind. In certain cases of vitreous opacities, keratitis, corneal opacities, as I have already stated, it is of undoubted value, but as a general ophthalmic panacea it is not to be considered. Its freedom from danger, when performed antiseptically, commends it to a trial in all cases, as I have seen it bring about most remarkable results in isolated instances in which nothing at all was expected. To substantiate my claims for this method of ocular therapy, I submit the following statistics:

1. Conjunctivitis	25
Do, with pannus	4
2. Corneal ulceration	100
3. Keratitis, all forms	150
4. Iritis, simple and specific	10
5. Iridocyclitis	10
6. Nebula of the cornea secondary to diseases (not injury) of from 2 to 5 years' duration	45
7. Vitreous opacities following retinitis, chorioretinitis and cyclitis	50
8. Retinitis	4
9. Chorioretinitis, acute	5
Do, chronic	25
10. Retinal detachment	10
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RESULTS.

1. (a) In conjunctivitis it is of no value. (b) In conjunctivitis, with pannus, I did not see that the subconjunctival injections shortened the course of the disease.

2. In corneal ulceration, in which the ulcers were sluggish and

the cornea infiltrated with pus, I found that the ordinary treatment was greatly aided by the injections.

3. Keratitis of All Forms.—In keratitis the greatest benefit from the injections was obtained. They served to shorten the disease and aided the other forms of medication materially. This treatment was especially valuable in chronic interstitial keratitis (syphilitic), particularly those cases in which, after subsidence of the acute symptoms, the corneal haziness had remained stationary and persisted indefinitely, resisting other forms of medication. Most of these cases had a duration of about two years and occurred in children from 8 to 15 years of age. Various treatments had been employed prior to the injections, but without success. After from 9 to 12 injections the cornea became transparent to the extent that nearly all of these patients had greatly improved vision. I am sure no other treatment could have accomplished such good results in so short a period.

4. Iritis and Iridocyclitis.—In a few cases (3) I found marked improvement, but my experience in this connection does not lead me to adopt this method as a routine procedure in the acute stage. After the subsidence of inflammatory symptoms, and when there remains behind a descemetitis, then the injections should be employed as they will produce absorption of the infiltrate.

5. Iridocyclitis.—The treatment was negative and was abandoned after the fourth injection in each case.

6. Nebula of the Cornea.—In 45 cases of corneal opacity varying from the most delicate macula over the pupillary area to a dense leucoma running diagonally across the cornea, I found marked improvement in each and every case. It is also interesting to note that the gain made was retained. The treatment was employed every eighth day and continued until ten injections were made. In cases in which no improvement was noticed by the patient after the tenth injection the treatment was discontinued; but if there was slight benefit the method was continued. These cases followed all sorts of inflammation of the cornea and were of from 2 to 5 years' duration.

7. In acute inflammation of the retina, choroid and optic nerve the injections were made beneath Tenon's capsule, but no improve-

ment followed their use. In the chronic forms the method was likewise devoid of benefit.

8. In the cases of vitreous opacity following any form of vitreous, retinal or choroidal disease, the benefit following deep injections was pronounced in all. In some cases vision was increased from 10/200 to 20/40, and in many others normal vision was restored in which one-fifth vision had previously existed.

It is in this class of cases that I urge the careful and persistent carrying out of the details of this treatment. Where I find the patient describing the vision as smoky (not hazy), i. e., the atmosphere slightly tinged with brown and filled with dark brown spots, I assume that the vitreous deposits have their origin in a slight cyclitis or retinitis, and I find that for this class of cases the subconjunctival injections constitute *the treatment.* They should be administered twice weekly for three weeks, and thereafter once a week until vision has been restored or until, after a fair trial, no improvement has been noticed. For the denser opacities, such as follow hemorrhages and their products, intense vitreous inflammation, and chorioretinitis following injuries, the injections should be made in Tenon's capsule.