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THE TREATMENT OF SIMPLE ULCERS OF THE CORNEA.

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CORNEAL ulcers, no matter how small and insignificant they appear to be, are always more or less dangerous. At any time the simple ulcerated spot may begin to spread rapidly, and the whole cornea become involved. In addition, any ulcer, except the most superficial, will, upon healing, bear a scar, or opacity, which interferes with the visual acuity to a greater or lesser extent—the nearer the center of the cornea the greater the impairment of vision. Hence, the proper management of corneal ulcers from the very beginning is of the utmost importance.

For our present purpose we may divide corneal ulcers into two classes, simple and complicated. By a simple ulcer I mean one which makes its appearance as a small, superficial grayish lesion of the cornea, with no marked tendency to spread and with slight inflammatory symptoms such as injection of the conjunctiva, some lachrymation and perhaps intolerance of light. By a complicated ulcer of the cornea I mean one that is more or less extensive, shows a disposition to spread rapidly and involve other portions of the cornea than that first affected, and which has all of the symptoms mentioned in connection with a simple ulcer in a markedly exaggerated form.

The former, or simple ulcers, in their early stages usually come under the observation of the general physician, and with proper management result in very little impairment of vision; while the latter or complicated ulcers are of such serious moment and so treacherous that it is with much difficulty that even the most skillful specialist can prevent the patient from losing a large portion of the visual acuity. Therefore, it is concerning the former that I shall speak to you for a few moments this afternoon.

A corneal ulcer usually presents itself as a small, grayish spot, the corneal tissue surrounding it being slightly hazy. This haziness may be a solid infiltration in all directions surrounding the gray spot, or it may go off from it, as numerous striæ. The surface soon breaks down and then the symptoms of irritation begin. We have the eyeball injected, an excessive flow of tears, intolerance and dread of light, and occasionally pain, the latter sometimes being out of proportion to the severity of the lesion, owing to the distribution of nerves in the anterior layer of the cornea.

When we search for the cause of corneal ulcers, both immediate and remote, we find them to be numerous. Any traumatism of the cornea may result in very serious ulceration. This traumatism may be produced by a foreign body, by misplaced eyelashes, by small growths, by chemical substances, etc. The ulcer may begin as an abscess which has perforated anteriorly, or it may depend upon the poor nutrition of the cornea, as in that dreaded and most disastrous disease, glaucoma. It may be caused by an extension of inflammation from the conjunctiva, the latter

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inflammation having been caused by an extension from the lachrymal duct; indeed, we may go still farther and say that the vast majority of corneal ulcers in children are caused by naso-pharyngeal inflammation, extending through the tear-duct to the conjunctiva, and from thence to the cornea. To be sure, the ultimate cause in all of these cases is the entrance into the corneal substance of the pus-forming organisms, the most frequent being the staphylococcus in its various forms. As is well known, we have in the conjunctival cul-de-sac, and on the cilia at all times, myriads of micro-organisms, and all that is needed to start a corneal inflammation is a slight scratch of the superficial epithelium. The micro-organisms immediately effect an entrance and we have a corneal ulcer.

Aside from the immediate causes we have others that are more remote, but none the less potent, factors in the origin of this affection. If the patient is anemic or strumous, or if the tone of the system be lowered from any cause, such as poor hygiene or poor diet, the circumstances are far more auspicious for the advent of any disease.

The diagnosis of a corneal ulcer is simple enough provided a careful search be made. If it be large it may be seen by ordinary daylight, presenting the form described above, of a grayish spot well defined, with a halo of cloudiness around it which gradually disappears the farther we get from the ulcer. If it is very small, by throwing the light upon the cornea through a pocket lens, which, by the way, you will all find a most useful adjunct to your paraphernalia, and viewing it from different directions, it can be very easily detected. Should there be any doubt in one's mind as to whether the spot seen is a fresh ulcer or a scar resulting from former ulceration, he can readily and positively determine the matter by dropping on the cornea two or three drops of a two per cent. solution of fluorescin, and then in a few seconds washing off the excess with any eye lotion at hand —say a solution of boric acid. If the spot is of the same color as before, there is no break in the corneal epithelium, therefore the spot is not an ulcer; but if the spot is of a light green color, it is indicative that ulceration is present. This drug, which is a member of the aniline group, has the power of coloring light green any denuded portion of the cornea; but if the epithelium be intact there is not the least change of color from its use. We have, therefore, an agent that will assist us in making an unmistakable diagnosis in all doubtful cases.

Should there be such dread of light that the patient cannot keep the lids separated long enough to enable us to make a satisfactory examination, a few drops of a four per cent. solution of cocain may be instilled and the examination concluded. One should not, however, use this drug in corneal ulcers if it can possibly be avoided, as the ultimate effect on the cornea is sometimes very disastrous.

As to the treatment of simple ulcers of the cornea, I regret that it is impossible to lay down any specific rules, the conditions of each case having to be met as they arise. However, there are several general principles that can be applied to all.

When a patient applies for the treatment of a corneal ulcer, the first thing to be done is to make a thorough search for the cause and remove it, if possible. A small foreign body may be imbedded in the ulcer; if so, it should be removed at once. If there are any misplaced cilia dragging over the cornea, they should be pulled out. If there is a conjunctival inflammation, it is to be treated as if the ulcer were not present. Should there be inflammation of the lachrymal duct, and especially if this be purulent, the case had better be referred to a specialist, as the treatment in these cases is rather complicated and requires considerable experience in this special line to deal with them successfully. If there be pres-

ent disease of the nares, or naso pharynx, this must be carefully attended to, for, as already pointed out, many corneal ulcers arise from this source. In other words let me repeat, one must deal with the cause as well as with the ulcer, for, if we deal with the latter alone, though it may get well, taking a much longer time to do so, it is almost sure to recur.

In the actual treatment recourse may be had to four remedies, hot fomentations, an antiseptic wash, atropin and dark glasses or a bandage.

The hot fomentations may be obtained by means of hot compresses applied in the following manner: Several small pieces of lint or flannel, three inches in diameter, are dipped into water about as hot as the hand can be held in for an instant, or at the temperature of 120° F., and placed two or three in thickness on the closed lids, these being replaced by others in about one to one and a-half minutes, more hot water being repeatedly added to keep up the temperature. These should be employed from fifteen to thirty minutes at a time, or longer if the ulcer shows any disposition to spread, and should be used from three to six times each day.

Immediately after using the hot compresses, and, if there be much discharge, between the times of their employment, an antiseptic wash, such as a solution of mercuric chlorid (1–6000), or a saturated solution of boric acid, should be instilled into the conjunctival cul-de-sac until the latter is entirely cleansed of all discharge.

The next in order of importance is the instillation of atropin. The strength is 4 grains to the fluid ounce for adults, and half this amount for children. This combats any impending inflammation of the iris, and reduces the general irritation of the eye, in this manner acting favorably upon the ulcer itself. It must be instilled sufficiently often to keep the pupil dilated, usually once or twice a day.

Some authors advocate the use of eserin in certain cases where the ulcer is situated near the periphery of the cornea, claiming that it promotes healing by stopping the migration of the white blood-corpuscles, by promoting absorption through dilatation of the ciliary vessels, and by reducing intra-ocular tension if this be present. The strength used is one-quarter to one grain to the fluid ounce, and a drop or two is instilled from three to six times daily, atropin being instilled at night to counteract any congestion of the iris or ciliary body that may have followed the use of eserin. Should there be any iritic complication, the eserin must be omitted and the atropin employed more frequently.

The patient should also wear dark glasses or a bandage. If there is present much discharge it is evidently improper to dam it up in an already inflamed eye, so it is better to use the dark glasses in these cases. If the amount of the discharge is small a well-applied bandage will materially assist in the reparative process—it being left off long enough for the application of the other remedies. The bandage must be applied lightly, but firmly, and must keep the lids closed and at rest without making any pressure on the eyeball. It also keeps out such extraneous matter as dust and dirt, and should be worn until the floor of the ulcer is covered with epithelium, which protects it from external irritation. In small children you can readily understand that the bandage is worse than useless—as it becomes displaced so easily, doing far more harm than good.

At the same time the ulcer is being treated locally it must be remembered that if there be any inflammatory condition existing in the nares, it must be treated also. You must pardon me for laying so much stress on this point as to repeat it, but such a large percentage of the cases of corneal ulcers arise from this source that I deem it to be most important.

If the inflammation be slight the use of a

mild alkaline spray, such as Dobell's solution, to cleanse the parts thoroughly once or twice daily, will sometimes suffice. Should there be much swelling of the turbinate bodies an application to them of compound tincture of benzoin will be found of much benefit in reducing it. This can easily be made by wrapping a bit of cotton on the end of a carrier, or probe, dipping it into the solution and passing it into the nares, touching the parts as it is being withdrawn. If this be followed by a spray of menthol, or menthol and camphor (grains 10 to 30 to the fluid ounce), dissolved in liquid petrolatum the effect will be very soothing and beneficial. Should there be any gross lesions such as polypi, spurs, or septal deviations, these should be remedied as soon as possible. It is not within the province of this paper to enter minutely into the treatment of the nares and naso-pharynx, and the above is given only as a suggestion that some such line of treatment be instituted as occasion may demand.

Frequently the means I have described are sufficient to treat successfully simple corneal ulcers; but occasionally a simple ulcer may pass into an extremely complicated one, and under such circumstances it is best to have the case examined and treated by one specially qualified for such work.

To recapitulate, the treatment of simple corneal ulcers should be pursued in the following order:

(1) Make a thorough examination of the conjunctiva, the lachrymal duct, the nares and naso-pharynx, as well as the cornea itself, and direct the treatment against the *cause*, whatever it may be, as well as against the ulcer itself.

(2) Employ locally hot compresses every few hours, or more frequently, according to the severity of the lesion.

(3) Cleanse the conjunctival cul-de-sac several times daily with an antiseptic and mildly astringent lotion, such as mercuric chlorid (1 : 6000), or boric acid solution, 15 grains to the fluid ounce.

(4) Instil a solution of atropin once or twice daily, and should the ulcer be marginal instead of central, a solution of eserin may be employed several times during the day and the atropin used at night.

(5) Protect the eye either with dark glasses or a well-applied bandage, the former in those cases in which there is considerable discharge, and in young children; the latter in those cases in which the discharge is slight and the patient sufficiently intelligent to allow the dressing to remain in proper position.

(6) Always correct unhygienic conditions or dietetic errors.