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GONOCOCCAL AND SYPHILITIC INFECTIONS OF THE EYE

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MR. T. H. C. BENIANS said the pathologist's part in a discussion of gonococcal infection of the eye was a very small one. He would refer to one or two practical aspects which came within his reach ; for the rest, he would give expression to a few theoretical considerations based on the pathology of superficial gonococcal infections more with the object of discussing them than to lay down any very definite suggestion.

In practical pathology in regard to superficial gonococcal infection of the eye one dealt with two things, or really only one in practice, and that was the diagnostic aspect. The diagnosis of gonococcal conditions of the eye by the bacteriologist was not a matter of great difficulty, but neither was it one of great certainty. By staining films of the pus by Gram's method, if it were an acute case, he would be able to say whether it was gonococcal. If it were a chronic case he probably would have also to make cultures, and he might be able in one way or another to detect the gonococcus, but even if he did not find it in such circumstances the condition might still be gonococcal. For internal lesions of the eye there were one or two other methods of diagnosis. For instance, in cases of iritis associated with deep-seated lesions one made investigations of the prostate and vesiculæ seminales or of the cervix uteri as the case might be, from which one sometimes got a positive result. And there were also available for such cases methods of complement-fixation, somewhat allied to the Wassermann reaction, by which one might sometimes detect an infection when direct methods failed. But, practically, the results of complement-fixation in gonococcal conditions were not sufficiently satisfactory for the bulk of pathologists to be able to speak from them with confidence.

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What he specially wanted to discuss was the pathology of superficial gonococcal infections of the body, and he sometimes wondered whether pathologists had not given clinicians an orientation, or outlook, on these infections which was leading them astray. The great men who worked on pathology, in the first instance, were men who made original discoveries, and started the germ theory. Clinicians had been sensibly affected by that movement, and they had carried on the same outlook, whilst, so far as a real understanding of the pathology and conditions of immunity in this condition was concerned, things had remained practically at a standstill. In superficial infection with the gonococcus the principal known data were as follows. The infecting organism was in most senses a very unstable coccus, that is, it readily died out in culture, and although, given proper conditions, it multiplied very rapidly; yet it was very subject to death, both by auto- and by sero-lysis. It did not excrete a toxin in the ordinary sense of the word, but when dissolved by lysis its products were disharmonious and deleterious to the human body. So much for the seed and the way in which it becomes harmful. Then, if we consider the soil in which it takes root, we find it is confined in its active features to a certain type of epithelium, *i.e.*, the squamous non-keratinised variety, that is, a delicate, moist pavement epithelium.

The Inter-action of Seed and Soil.—For the organism to obtain a footing there must first be a certain amount of stasis, and this is likely to obtain in the infantile eye where the lids are comparatively seldom moved and the secretion slight or lacking. During this stasis it may be presumed that lysis of the implanted organism occurs and toxic bodies are set free. Now in these epithelial regions, more especially in that of the cornea, the nerve endings ramify freely and without protection in among the epithelial cells close to the surface, and are there subject to stimulation by the toxic bodies. This stimulation results in a reflex dilatation of the blood vessels in that area. In the slowed stream the leucocytes stick to the vessel walls and diapedesis follows with a more or less extensive effusion of the serous elements of the blood and thickening and roughening of the conjunctiva, with exfoliation of the sodden epithelium. These constitute the essential phenomena of the inflammation.

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The teleologist, perhaps rightly, regards this reaction as an attempt on the part of the body to destroy the invading cocci, but he must remember that it is this reaction which, if it goes far enough, will destroy the eye, and also, from the pathological point of view, that it is from the killed cocci that the toxins arise. If he pins his faith to the phagocytosis, which is a very marked characteristic of gonococcal infections, he is met by the fact that, despite its apparently delicate constitution, the gonococcus can live and grow in the phagocyte, and may by it be transported, in a living condition, to other parts of the body. From these considerations it would appear that the reaction to a superficial gonococcal infection, instead of being looked on as beneficent from the host's point of view, should rather be regarded as the production of a suitable nidus for itself by the gonococcus. If it is so, it seems that there are certain essential points at which we might grasp the pathology of this condition, any one of which should bring it within control.

(1) We might entirely kill off the organisms; this is only effective prophylactically because of the thickened rugose tissues present in an established infection.

(2) We might prevent lysis of the organisms, or so dilute the toxins that they are ineffective. Most treatment at present aims at a combination of these two methods.

(3) We might block the nerve paths, or we might prevent the reflex dilatation of the blood vessels. It is the possibilities contained in these two last suggestions that he would bring to the notice of the practical physicians and surgeons present.