PRIMARY TUBERCULOSIS OF THE CONJUNCTIVA*

BY

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UNTIL 1922, the possibility of a primary tuberculous affection of the conjunctiva, in any of its clinical forms, was a debatable problem. Most of the observers, before that date, considered the healthy conjunctiva a barrier to the entrance of the bacilli, and consequently that all cases of tuberculosis of the conjunctiva were either endogenous in origin, the infection arriving through the blood stream, or an extension of infection from a neighbouring affected tissue. In 1922, Igersheimer found that if tubercle bacilli were dropped in the conjunctival sacs of healthy guinea-pigs, these usually developed a conjunctival lesion and invariably a lymphadenitis. Subsequently many other workers (Lange, 1924; Bruckner, 1929; etc.) confirmed these findings and thus the possibility of a primary tuberculous affection of the conjunctiva was accepted.

Origin.—Tuberculous lesions of the conjunctiva may arise as follows:

- (1) Exogenously (a) as a primary infection.
(b) as a superimposed infection in a patient already suffering from tuberculous disease elsewhere.
- (2) Endogenously from an established remote focus.
- (3) By Direct Extension, from a tuberculous lesion of a neighbouring tissue, such as the skin and nose in lupus, or the sclera, lacrimal sac, or orbit.

Tubercle bacilli reaching the conjunctiva by any of these three routes may cause a tuberculous conjunctivitis in one of the recognized five clinical forms, the ulcerative type, the nodular type, the hypertrophic papillary type, the polypoid type, and the conjunctival tuberculoma. The main difference between a primary lesion and a superimposed infection is the marked regional lymphadenitis which nearly always accompanies the former. Though this view is not generally accepted, especially by those workers who study the subject from an experimental standpoint, yet in nearly all recorded cases, with an established diagnosis of primary tuberculosis of the conjunctiva, a marked regional lymphadenitis was also present.

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Case Incidence.—Tuberculosis of the conjunctiva, as a primary lesion or a superimposed infection, is a rare condition. Only isolated cases have been reported in America (Coover, 1920; Cohen, 1919; Thompson, 1906; McKenzie, 1939; Sitchevska and Sedan, 1943). Ivanov (1939) stated that only two cases were seen in the Moscow eye clinic in 1935 among 94,000 patients. Samuelson (1936) observed, during the years between 1915 and 1934, seven patients with tuberculosis of the conjunctiva, three of which were primary infections, among 181,000 patients seen at the ophthalmic clinic of the Seraphimer hospital in Stockholm. Blegvad (1936) encountered forty cases of primary tuberculosis of the conjunctiva during the years 1909 to 1934 in the Finsen Institute in Copenhagen. He believes that this frequent occurrence of tuberculosis of the conjunctiva was due to the prevalence of tuberculosis in cattle in Denmark. In Egypt, 33 cases of tuberculosis of the conjunctiva were observed during the years between 1925 and 1948 amongst the patients attending ophthalmic hospitals all over the country.

Location.—According to Willard, tuberculous lesions of the conjunctiva affect the palpebral conjunctiva in 70 per cent. of cases, the bulbar conjunctiva in 22 per cent. of cases, and the fornix in 8 per cent. of cases. In Egypt, out of the 33 cases noticed between 1925 and 1948, 40 per cent. were in the bulbar conjunctiva, 48 per cent. in the palpebral conjunctiva, and 12 per cent. in the fornix.

Age and Sex.—The disease is most frequent in the first 20 years of life. Twice as many women as men are affected. Out of the 33 cases noticed in Egypt between 1925 and 1948, only four were above 20 years of age, one being only 4 months old. 70 per cent. of the cases were in males and 30 per cent. in females, which is contrary to the general incidence in other countries.

Differential Diagnosis.—The diagnosis is only made certain by biopsy, guinea-pig inoculation, and the discovery of the bacillus in smears or in tissue sections. The histological appearance on biopsy is the most important as the actual tubercle bacillus was only found in 25 per cent. of the cases reported in the literature on examination of the secretion or the excised tissue. The Mantoux test, though unreliable, was positive in 99 per cent. of cases.

Case Report

K. M. S., a boy aged 10 years, was first examined at the Memorial Ophthalmic Laboratory on May 2nd, 1949.

History of Present Illness.—On December 4th, 1949, he attended Ashmoun Ophthalmic Hospital suffering from a small painful swelling of the bulbar tissues below the limbus of the left eye. The nodule was yellow in colour and the neighbouring conjunctiva was injected and chemosed. The movements of the

FIG. 1.—Condition before treatment.

globe were normal. The cornea and deeper media were clear and the fundus appeared normal. The pupil was normal in size and reaction. L.V.=6/9. The right eye was normal. R.V.=6/9.

The nodule was incised at Ashmoun o.h. under the impression that it was a "pustule." The condition subsequently deteriorated and the patient was referred to the Laboratory for investigation.

Previous Medical History.—The patient has suffered from dry cough and night sweating for some months. He was twice treated for bilharzia.

Family History.—The father and mother are both living. His six brothers are all in good health. (All were subsequently examined and pronounced free from active tuberculosis).

Condition on First Examination at the Laboratory.—The child was thin and anaemic. Weight 24.5 K.G. Height 130 cms.

Right eye: No apparent abnormality. R.V.=6/9.

Left eye: Below the limbus and extending towards the lower fornix was a raised roughly circular mass of conjunctival tissue. Almost the entire surface of the affected area was ulcerated and the edges were rolled and indurated. The mass was softish and firmly attached to the sclera. The cornea, anterior chamber, iris, lens, and vitreous were normal. The fundus showed a detachment of the retina down. The tension of the eye was normal. The preauricular and sub-maxillary lymph nodes on the left side were enlarged and tender. The upper third of the left visual field was lost.

The differential diagnosis lay between tuberculosis, schistosomiasis, syphilis, and new growth. A primary tuberculous infection seemed to be the most probable and this was confirmed later by histological examination of a biopsy specimen.

Laboratory Examinations:

- (1) X-ray examination of the chest showed "infiltration around the hilum of the right lung which is not definitely tuberculous". A second radiologist

gave the following report: "A triangular, fairly dense, homogenous shadow is seen in the base of the right upper lobe with its apex peripherally and its base in close contact with the hilum of the lung. This shadow is suggestive of epituberculosis".

- (2) The sputum examined on three successive days was negative for tubercle bacilli.
- (3) Zeihl Neilsen preparation from the ulcer was negative.
- (4) A piece of the ulcer for biopsy was excised and examined. The sections showed numerous tubercle nodules but no caseation. In some sections, giant cells of the Langhans type are seen. The picture was that of a low grade tuberculous inflammation.
- (5) The guinea pig inoculation showed:
 - (a) no caseous local lesion at site of injection;
 - (b) no pathological lesion and no enlargement of spleen;
 - (c) no pathological lesion in liver and lung;
 - (d) enlarged sublumbar lymph glands were excised for histo-pathological examination. This showed a tuberculous infection.
- (6) The urine contained bilharzia ova.
- (7) The stools were negative.
- (8) Wassermann reaction and Kahn test were negative.
- (9) A smear from the ulcer was negative for spirochaetae.
- (10) A gram-stained smear showed xerosis bacilli. The culture showed the same organisms.
- (11) The blood picture was:

Haemoglobin	66 per cent.
R.B.Cs.	4,560,000.
W.B.Cs.	6,800.
D.B.C. Polymorphs	46 per cent.
Eosinophiles	7 per cent.
S. lymphocytes	22 per cent.
L. "	20 per cent.
Hyaline	5 per cent.

Thus the case was diagnosed as a tuberculous ulcer of the conjunctiva, probably primary in nature. The initial surgical interference had presumably injured the sclera and spread the infection inwards causing a secondary detachment of the retina.

Therapy.—Treatment with Dihydro-streptomycin was started on May 14th, 1949, and continued for 25 days. The equivalent of 1 g. streptomycin was given daily in divided doses, 0.4 g. in the morning, and 0.6 g. in the evening, by deep intramuscular injection. The drug was well tolerated. No other treatment was given during this time.

After the end of the treatment with streptomycin, the local condition of the eye was much improved. About 90 per cent. of the ulcerated area had healed, and about 70 per cent. of the retinal detachment had disappeared. The mass, though diminished to nearly half the original size, was still raised.

Ultra-violet therapy was then begun with local application to the affected conjunctiva of one to two minutes every third day, and general radiation of the body also every third day.

Result.—In October, 1949, the condition was as follows. The upper two-thirds of the mass has completely disappeared. Scar tissue is apparent in the sclera underneath the conjunctiva. The lower third near the fornix was still slightly raised with a small polypoid mass present. The submaxillary lymph nodes were non-palpable. The left pre-auricular lymph glands were still palpable, but small and not tender. The detachment of the retina has completely disappeared, leaving a pigmented scar in the extreme lower periphery near the ora serrata.

The left vision was 6/12 without correction, and the visual field was complete.

FIG. 2.—Condition one month later, after treatment with streptomycin.

FIG. 3.—Final condition four months later.

FIG. 4.—Fields of vision taken before treatment (23-5-49), after streptomycin treatment (28-6-49) and (31-10-49).

Conclusion

The case is considered cured, as the ulcer has completely healed, the subretinal extension has resolved with re-attachment of the retina, and most of the bulk of the subconjunctival mass has disappeared, with healing of the scleral wound. There is no doubt that this result is mostly due to the effect of streptomycin although the amount given was comparatively small. Ultra-violet therapy probably aided in the completion of the healing process. Considering the severity of the lesion and its extension intra-ocularly, I do not think that without the aid of streptomycin we could have saved this eye as a useful seeing organ, and in so short a time.

Summary

1. A case of tuberculous ulceration of the conjunctiva with accidental intra-ocular extension is described.
2. The case was treated with streptomycin and ultra-violet therapy with a successful end result.

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