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**BILATERAL SYMMETRICAL TUBERCULOUS ULCERS
OF THE BULBAR CONJUNCTIVAE TREATED
WITH STREPTOMYCIN**

BY

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TUBERCLE of the conjunctiva is a rare condition. It occurs chiefly in young people between the ages of 20 and 30, and assumes various forms, possibly by reason of difference in the virulence of the infection, and difference in individual resistance. Clinically five types are recognised, but sometimes various forms are found combined.

CLINICAL TYPES.

(1) Ulcerative type—characterised clinically by the presence of one or more miliary ulcers, which may or may not coalesce. They are usually found on the palpebral conjunctiva, rarely on the bulbar conjunctiva.

(2) Nodular type—characterised by small greyish subconjunctival nodules, which are very difficult to differentiate from trachomatous granules.

(3) Hypertrophic papillary type—characterised by outgrowths of granulation tissue, which usually arise from the fornices, sometimes from the tarsal conjunctiva. Sometimes they become pedunculated and project on to the surface forming cock's-comb excrescences, which frequently show superficial ulceration.

(4) Polypoid type—pedunculated tumours arising from the tarsal conjunctiva.

(5) Tuberculoma—hard solid subconjunctival nodules in the bulbar conjunctiva, which do not undergo ulceration. The conjunctival epithelium remains intact, while the rest of the conjunctiva remains normal.

MODE OF INFECTION

Most of the cases are probably endogenous and therefore secondary, others are exogenous and primary. When primary, the infection is carried from outside, e.g., by particles of sputum or dust bearing tubercle bacilli. There may be a breach of the mucous membrane from trauma, and the abraded surface is infected with tubercle bacilli. Occasionally the conjunctiva is

affected by direct extension of lupus from skin or nose, or from adjacent tuberculous disease of the sclera, ciliary body or choroid.

CASE REPORT.

Patient A. K. D., 21, Hindu, male, a resident of Midnapore (Bengal), cultivator by occupation, came to the out-patient department of the Eye Infirmary, Medical College Hospitals, Calcutta, on June 9, 1948, and was admitted under the Professor of Ophthalmology on June 12, 1948, for symmetrical conjunctival ulcers of both eyes, involving the bulbar conjunctiva.

Present history. One year previously, he had noticed oedema of both lids with considerable epiphora and photophobia. Two months later, epiphora was much less in the left eye but there was considerable discharge from it throughout the day. Three months after, he noticed a shallow ulcer in the left eye just below the cornea. In the right eye he started getting muco-purulent discharge eight months later. He never noticed any ulceration in the right eye.

Family history. Parents are alive and healthy. He has two brothers and two sisters, all of them healthy. He is unmarried and there is no history of contact with any tuberculous individual.

History of past illness. The patient had an attack of malaria 3 years previously and was cured in three months. He had an attack of dysentery 2 months previously. While in hospital he had a relapse. He gives a history of haemoptysis once, and that occurred about a month and a half before the eyes became affected. For 8 days he had streaks of blood with the sputum, and also had epistaxis at that time. He does not give any history of evening rise of temperature, night sweats or loss of appetite and weakness.

Diet. He lives on an average Bengali diet consisting of rice, dal, vegetables, fish and milk. Occasionally he takes meat and fruits.

Examination of the case at the time of admission.

The patient was rather thin. Both palpebral fissures were narrowed.

In the right eye the bulbar conjunctiva was extremely congested. Below the cornea there was an oval ulcerated patch $\frac{1}{2}$ in. x $\frac{1}{2}$ in. with well-defined margins. The floor of the ulcer had involved the sclera. On the surface of the ulcer there was a whitish discharge. Cornea was clear. There were no k.p. Pupil active to light. Tension normal. Vision 6/12. Fundus healthy.

In the left eye the condition was the same, except that the ulcer was bigger and deeper than in the right eye. The erosion of the sclera was greater, and uveal tissue could be seen through the floor of the ulcer. The lower part of the cornea was involved in the ulcerative process. Vision 6/18. No pathological changes seen in the fundus.

No glandular enlargement was detected. Examination of heart and lungs did not reveal any pathological lesions.

Temperature was recorded for 7 days and no rise was detected at any time of the day or night.

Investigations and treatment.

On June 23, 1948, he had an attack of dysentery.

Stool examination report:—

Reaction	...	...	...	...	...	Acid
Pus cells	...	...	...	...	...	+
R.B.C.	...	...	...	...	...	++
Mucus	...	...	...	...	...	+
Blood	...	...	...	...	...	+
Epithelial cells	...	...	...	...	...	+
Entamoeba histolytica	...	...	...	...	...	++
Ova of ankylostoma duodenalis	...	...	...	...	...	+
Larvae of strongyloides stercoralis	...	...	...	...	...	+
Vegetable cells	...	...	...	...	...	++
Occult blood reaction	...	...	...	...	...	+

FIG. 1. Showing the ulcers at the time of admission. Picture drawn on June 12, 1948.

FIG. 2. Six days after streptomycin treatment. Picture drawn on July 30, 1948.

FIG. 3. Twenty-four days after streptomycin treatment. Picture drawn on August 18, 1948.

FIG. 4. The condition of the conjunctiva on September 2, 1948.

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He was treated with emetine hydrochloride injections followed by enterovioform tablets, and the dysenteric infection was cured.

On June 26, 1948 discharge from the floor of the conjunctival ulcers was sent for culture, and scrapings for any acid-fast bacillus. The culture was found to be sterile. Scrapings revealed presence of acid-fast bacilli.

On June 28, 1948 patient was sent to the chest department for Mantoux test and skiagram of the chest. The Mantoux test was ++ with 10,000 dilution, which suggests that his reaction was of high intensity. Screen examination showed no lung infiltration; this was corroborated later by skiagram of the chest.

On June 29, 1948 a section of the conjunctiva from the edge of the ulcer was taken and submitted for histological examination. Section showed heavy infiltration of the subepithelial layers with round cells, and a few typical tubercular giant-cell systems with epithelioid cells.

On June 29, 1948 a smear was taken again for A.F.B. and found to be positive.

On July 2, 1948 his total and differential blood count was done, and sedimentation rate was estimated.

Blood picture:—

Total W.B.C.	...	7500 per c.mm.
Poly. ...	...	59 per cent.
Lympho. ...	...	20 per cent.
Large mono. ...	...	2 per cent.
Eosinophil ...	...	19 per cent.
No M.P. seen.		
W.R. and Kahn	...	Negative.
Sedimentation rate	...	40 mm. per hour (Westergren method).

The centrifugalised deposit of urine was examined for acid-fast bacilli on June 30, 1948, but none was found.

Treatment.

When the patient first came under treatment, his eyes were washed with normal saline, and penicillin drops (1500 units per c.c.) were instilled every hour without benefit. The ulcers were cauterised with pure lactic acid 3 times, but results were disappointing.

On July 24, 1948 streptomycin treatment was started locally and perenterally. 1 gm. of streptomycin was dissolved in 2 c.c. of distilled water, and drops were put in each eye every hour from 8 a.m. to 8 p.m. each day. For injection, 1 gm. of streptomycin was dissolved in 2 c.c. of pyrogen-free distilled water, and was injected intramuscularly deep into the gluteal region.

July 24, 1948, 6.30 p.m.	...	...	1 gm. streptomycin
July 25, 1948, 9.00 a.m.	...	...	1 gm. streptomycin
6.00 p.m.	...	...	1 gm. streptomycin
July 26, 1948, 8.15 a.m.	...	...	1 gm. streptomycin
7.00 p.m.	...	...	1 gm. streptomycin
July 27, 1948, 8.00 a.m.	...	...	1 gm. streptomycin
6.30 p.m.	...	...	1 gm. streptomycin
July 28, 1948, 8.00 a.m.	...	...	1 gm. streptomycin
7.00 p.m.	...	...	1 gm. streptomycin
July 29, 1948, 8.00 a.m.	...	...	1 gm. streptomycin
July 30, 1948, 8.00 a.m.	...	...	1 gm. streptomycin
July 30, 1948, ulcer in the right eye	...	...	healed considerably.
July 31, 1948, 8.00 a.m.	...	...	1 gm. streptomycin I.M.

July 31, 1948, smear examination from the ulcers did not reveal the presence of any acid-fast bacillus.

From August 1, 1948 to August 17, 1948, each morning at 8 a.m. the patient had 1 gm. of streptomycin intramuscularly.

From August 1, 1948, streptomycin drops were stopped in the right eye, but were continued in the left eye every hour.

From August 5, 1948, streptomycin drops were given at a strength of 0.01 per cent. solution until August 13, 1948. The ulcers seemed to remain static, so previous strength was resorted to, i.e., 1 gm. of streptomycin in 2 c.c. of distilled water.

REMARKS

Altogether 29 gm. of streptomycin were injected, and 7 gm. were used as drops. It was found that at first, with streptomycin, the ulcers cleared up rather rapidly, but after some time they became static, and when streptomycin was stopped, the healing process proceeded rapidly. We always remembered the complications which might follow large doses of streptomycin, and were very cautious in administering it. When the ulcers were completely healed there was slight symblepharon in each eye.

The illustrations were drawn on days noted against each of them. Microphotographs of the section are seen in Figs. 5 and 6.

FIG. 5.

Microphotograph of the section taken from the edge of the conjunctival ulcer—low power.

FIG. 6.

Microphotograph of the section taken from the edge of the conjunctival ulcer—high power magnification showing typical tuberculous giant-cell system with epithelioid cells and round cell infiltration.

SUMMARY

1. A case of bilateral tuberculous ulcer of the bulbar conjunctiva treated with streptomycin is described.
2. There was no response to penicillin therapy or lactic acid cauterisation.
3. The ulcers responded marvellously with streptomycin applied locally and parenterally.
4. There was no untoward complication after streptomycin therapy.
5. High concentrations of drops seem to have a better effect than low concentrations.
6. The ulcers seem to progress more favourably if the injections and drops are discontinued for some time after a few days of treatment.
7. After 7 days of treatment with streptomycin, scrapings from the floor of the ulcers failed to reveal the presence of any acid-fast bacilli.
8. Sedimentation rate dropped from 40 to 10 mm. per hour after streptomycin treatment.

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THE PHOTOPIC LUMINOSITY CURVE AND VISUAL PURPLE

BY

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RECENTLY Dartnall has suggested that the photopic as well as the scotopic luminosity may be mediated by the single pigment visual purple. He has deduced the shape and spectral position of the photopic luminosity curve of the eye by calculating the effect of an accumulation of indicator yellow upon the spectral distribution of the light absorbed by visual purple. He finds that the effect of increasing indicator yellow concentration is not, as might be