CASE NOTES

ORBITAL ASPERGILLOSIS*

BY

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OUR experience of corneal ulcers has shown an increase in the incidence of fungal infections through the indiscriminate use of antibiotics and corticosteroids.

Orbital infection by *Aspergillus* producing proptosis is rare, only seven cases having been traced in the literature, all showing orbital involvement secondary to infection of the nasal sinuses. Dalmeijer (1913) reported one case (Duke-Elder, 1952); Wright (1927, 1930) two cases ineffectively treated by deep x-rays and radium; Adams (1933) a case of aspergillosis fumigatus, in which the radical removal of granulomatous tissue and subsequent potassium iodide therapy seems to have produced a cure; Veirs and Davis (1958) a case of proptosis supposedly due to aspergillosis in which the pathogens were not isolated or definitely identified; Tikhomirov (1958) a severe case in which the patient died through the spread of infection to the central nervous system (this case was not diagnosed clinically but autopsy established *Aspergillus* infection); Bailey and Fulmer (1961) a fatal case treated by modern anti-fungal drugs and potassium iodine, in which autopsy revealed an extension of the infection through the roof of the orbit and along the base of the brain.

Case Report

A male Hindu aged 34 years came to the hospital with the complaint of an increase in size of the right eye for 8 months and swelling of the right cheek for 2 months.

History.—He had had an operation elsewhere on the maxillary sinus by Caldwell-Luc's approach for the removal of a granulomatous mass. The histopathological reports at that time were suggestive of chronic inflammatory granuloma. A course of crystalline penicillin and colossal iodine had been given without much effect on the proptosis.

Examination.—The eye was pushed upwards and outwards (Fig. 1a, b, overleaf) and the proptosis was irreducible. Palpation through the lower lid revealed a diffuse firm mass invading the orbit, so that it was difficult to differentiate between the mass and the lower orbital margin. The visual acuity and fields were normal. Ophthalmoscopy revealed no abnormality. There was a firm diffuse swelling on the right cheek fixed to the right maxilla, and the skin over it was mobile. A nasal polyp was found on the inferior turbinate. Examination of the antrum revealed that the orbital plate was deficient through

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FIG. 1 (a, b).—Proptosis due to *Aspergillus terreus*.

being affected by the granulomatous tissue. A biopsy was taken and special staining for *Aspergillus fumigatus* gave a doubtful result.

A course of streptomycin was started but the proptosis and swelling over the right cheek increased. The swelling now became cystic, and cheese-like material removed with a bone-marrow puncture needle was shown on culture to contain *Aspergillus*. The polyp on the inferior turbinate was removed and periodic acid-Schiff staining showed fungal hyphae in relation to giant cells.

The orbit was explored through an anterior orbitotomy, and friable granulomatous material was found to extend to the apex of the orbit. Two big pieces surrounding the optic nerve were removed with the finger tip.

The patient was given "Mysteclin", one capsule three times a day, and was advised to continue for 2 months.

Result.—He made an uneventful recovery with marked reduction in the proptosis, though there was some residual limitation of the ocular movements on downward gaze.

Progress.—4 months later there was no increase in the proptosis but a cystic swelling appeared again over the right cheek. The cyst was opened, all the granulomatous tissue was removed, and the wound was dressed with "Hyamycin". The wound healed, and the patient continued with Mysteclin and colossal iodine, Hyamycin being instilled through Caldwell Luc's opening.

After 5 months there was some increase in the proptosis and the cystic swelling over the cheek reappeared.

Histopathology of Nasal Polyp and Orbital Granuloma

Sections showed giant cells containing septate mycelial filaments, which were better demonstrated with periodic acid-Schiff stain (Figs 2 and 3, opposite). The fructification which occurred on culturing the fungus was not found in the tissue.

A smear prepared and stained with periodic acid-Schiff revealed the presence of hyphae (Fig. 4, opposite).

The suspect material was cultured in Sabouraud's glucose agar slants and incubated at room temperature (25°C.).

The colonies were fast growing and appeared first as white filaments on the surface of the media, but quickly became greenish in colour as spores were produced. On further incubation the colonies became cinnamon-coloured.

FIG. 2.—Septate micelial filament in nasal polyp.

FIG. 3.—Histology of orbital granuloma, showing septate micelial filament.

Microscopic examination revealed columnar heads with smooth colourless condophores. The vesicles were dome-shaped (hemispherical) with sterigmata into series, usually crowded. The conidia were small, smooth, and globular or slightly elliptical and were arranged in long parallel and adherent chains. No perithecium or sclerotium was noted. The morphology was characteristic of the *Aspergillus terreus* group (Fig. 5).

FIG. 4.—Smear showing presence of hyphae.

FIG. 5.—Morphology of *Aspergillus*.

Experimental Inoculation of the Fungus into Rabbit Corneae

The pathogenicity of the cultured fungus was proved by injecting hyphae into the layers of the cornea which produced severe sloughing corneal ulceration with marked iritis in the eyes of three albino rabbits (Fig. 6).

FIG. 6.—Experimental corneal ulcer showing *Aspergillus terreus*.

Discussion

This case shows the difficulty of diagnosing a case of proptosis due to fungus infection. The lesion resembled other chronic granulomata, such as those due to tuberculosis. Suspicious acid-fast bacilli were reported in one of the tissue sections and the patient was given antitubercular treatment without any benefit. Culture and animal inoculation excluded tuberculosis. A carcinomatous growth might have been suggested by the erosion of the bones but this was excluded by biopsy. Adams (1933) claimed an apparent cure a year after the excision of the granulomatous tissue, but in our case the response to antifungal drugs and excision has not been encouraging. In fact our patient's condition is worsening and the prognosis seems to be poor. Considering that most patients with orbital aspergillosis have ultimately died of it, such an infection should be regarded as a serious catastrophe. We suggested enucleation, removal of all granulomatous tissue from the orbit, and pan-sinusectomy, but the patient did not agree to this because he still has a useful functioning eye.

Encouraged by Wright's report we gave x-ray therapy, but there was no improvement. The first two exposures were followed by a violent erythematous reaction, with nausea, vomiting and general malaise. The treatment has now been discontinued.

REFERENCES

- ADAMS, N. F. (1933). *Arch. Surg.*, **26**, 999.
BAILEY, J. C., and FULMER, J. M. (1961). *Amer. J. Ophthalm.*, **51**, 670.
DALMEIJER, J. J. (1913). *Ned. T. Geneesk.*, **2**, 2117.
DUKE-ELDER, S. (1952). "Text-book of Ophthalmology", vol. 5, p. 5469. Kimpton, London.
TIKHOMIROV, P. E. (1958). *Vestn. Oftal.*, **71**, No. 1, p. 44.
VEIRS, E. R., and DAVIS, C. T. (1958). *A.M.A. Arch. Ophthalm.*, **59**, 172.
WRIGHT, R. E. (1927). *Brit. J. Ophthalm.*, **11**, 545.
——— (1930). *Ibid.*, **14**, 601.