

# FUSARIUM SOLANI KERATITIS FIRST REPORT FROM MALAYSIA

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## SUMMARY

*The first culture-proven case in Malaysia of fungal keratitis, due to Fusarium solani, is presented, followed by a brief discussion of mycotic keratitis.*

## INTRODUCTION

Fungal keratitis was thought of as an infection of low incidence, but of late it has been reported with

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increasing frequency from several parts of the world (Francois and Rysselaere, 1972, Jones *et al*, 1969, Jones *et al*, 1969, Chin *et al*, 1973, Forster and Rebell, 1975, Gugnani *et al*, 1976). We present a case of *Fusarium solani* keratitis in a young girl: to our knowledge, this is the first case of a culture-proven fungal infection of the cornea in Malaysia.

## Case Report

An eight year old Indian girl was referred to the Eye Clinic of Universiti Kebangsaan Malaysia for the management of a painful, red and discharging right eye. The patient and two of her brothers had almost simultaneously developed red eyes, for which they were prescribed combination steroid-antibiotic drops by a general practitioner. Her brothers got well, but the patient's right eye worsened: the eye became more red, photophobic and began to have a purulent discharge. Family members noticed a "white spot" on the cornea.

At time of presentation, the right visual acuity was Hand Movements only. The left eye was white and normal, with an acuity of 6/5. The right eye showed the following: swollen lids, hyperemic conjunctiva, a large central corneal ulcer (Fig. I) with slough and an underlying opaque stroma. There were no "hyphate" margins or raised edges. An intense iritis was noted. The preliminary diagnosis was that of a bacterial ulcer.



Fig. 1 Corneal ulcer caused by *Fusarium solani*.

A diagnostic curettage was immediately undertaken and the material sent for microbiological studies. A subconjunctival injection consisting of Gentamicin 40mg and mydracaine 0.2ml was given stat, and the patient commenced on Gentamicin drops hourly, Polyfax ointment 4 hourly, atropine drops b.d., and systemic Ampicillin.

The following day, the condition worsened, and the microbiology reports were negative. Forty-eight hours after admission, a fungus was noted to be growing in the culture medium. A microscopic examination of the fungus, using Lactophenol Cotton Blue Stain showed crescent-shaped macroconidia resembling *Fusarium* species. A repeat curettage was done. This time the direct smear showed fungal hyphae. The repeat culture on Sabouraud's dextrose agar and blood agar at 30°C and 37°C, grew the same fungus after 24 hours incubation. The strain isolated from the specimen was sent to the Mycological Reference Laboratory, London School of Tropical Medicine and Hygiene, and was identified as *Fusarium solani*.

Since Pimaricin was not available, Amphotericin B drops hourly were commenced, but the cornea perforated the next day. The parents refused enucleation. Emergency keratoplasty could not be done owing the non-availability of fresh donor cornea. Six months later the eye lost all light perception. The cornea showed an adherent

vascularised leucoma, and the eye was noted to be going phthisical.

## DISCUSSION

*Aspergillus*, *Candida*, *Penicillium* and *Nocardia* were generally considered to be the most important fungi to infect the cornea up to the early sixties (Francois and Rysselaere, 1972), but later reports leave no doubt that *Fusarium*, particularly *F. solani*, is the single most important fungus causing mycotic keratitis (Jones *et al* 1969, Forster and Rebell, 1975, Gugnani *et al*, 1976, Polack *et al*, 1971). It grows very rapidly on the cornea (Polack, 1973), and has been reported as being able to cause endophthalmitis without primary corneal involvement (Liebermen *et al*, 1979).

Predisposing factors (Francois and Rysselaere, 1972, Forster and Rebell, 1975, Gugnani *et al*, 1976, Polack *et al*, 1971, Polack, 1973) are (i) trauma, especially with vegetable matter (the most important), (ii) outdoor work (iii) an agricultural community (iv) subtropical or tropical climate. The advent of antibiotics and steroids has been blamed for the increasing incidence of fungal keratitis (Francois and Rysselaere, 1972, Jones *et al*, 1969, Polack, 1973), but some authors are doubtful about this (Forster and Rebell, 1975). Fungus was also thought to infect eyes with previous disease: this has been borne out only with yeast infections others have been primary infections (Forster and Rebell, 1975).

Clinical features of the fungal corneal lesion have been described (Kaufman and Wood, 1965), and consist of (i) white or dirty-grey ulcer with thickened or elevated borders (ii) "hyphate" margin (iii) satellite lesions (iv) "immune ring" around the ulcer (v) and endothelial plaque, with or without a hypopyon. There do not seem to be any particular distinguishing features of *Fusarium* infections.

Laboratory diagnosis is crucial in the management of mycotic keratitis. Direct demonstration of the fungus in the smear leads to an immediate diagnosis. When little fungus is present in the smear, the *Gram* and *Giemsa* stains, and the *Potassium Hydroxide* wet mount, may not be satisfactory. A shortened version of the *Grocott's methenamine-silver technique* has been reported as

being superior to the current staining methods (Forster *et al*, 1976). *Fusarium solani* grows rapidly at 37°C unlike most fungi which grow better at 30°C. It grows well on media for bacterial culture. The colonies appear fluffy and pinkish with extensive aerial mycelia within 48 hours of incubation. It can be distinguished from other by its crescent-shaped macroconidia.

Fungal keratitis generally had a poor prognosis because of the limited number of antifungal agents available: Nystatin is effective only against *Candida*; *Amphotericin B* has a wide spectrum, but it is ineffective against *F. solani*. The introduction of *Pimaricin*, a polyene antibiotic originally isolated in 1955 from *Streptomyces natalenses*, has resulted in a marked improvement in the prognosis of *Fusarium solani* keratitis (Jones *et al*, 1972, Forster and Rebell, 1975). If the infection fails to respond to the eye drops, then some form of surgical procedure becomes necessary. A conjunctival flap has been reported as being useful, but does not work well if there is deep and extensive ulceration (Polack, 1973). Better results are achieved if the fungus is rendered non-viable with Pimaricin prior to surgery (Forster and Rebell, 1975).

Fungal keratitis is probably an underdiagnosed disease in Malaysia, as one would expect the largely agricultural population to be very susceptible in the humid, hot climate. Our patient was only a school girl, and the fungal keratitis here was preceded by a conjunctivitis, probably viral, and perhaps by the prior use of steroid-antibiotic combination drops. The rapidity of the infection, the non-availability of pimaricin, and the difficulty of obtaining fresh donor material for emergency keratoplasty all contributed to the final, hopeless outcome.

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