Aspergilloma of the ethmoid

By F. D. MARTINSON, A. F. ALLI and B. M. CLARK (Ibadan, Nigeria)

Since the early records of aspergillus infections of the upper respiratory tract in man (Zarniko 1891; Schubert 1885), there have been sporadic reports in the literature from various parts of the world. These give the impression that while the incidence of the infection naturally varies in different countries, it is on the whole uncommon (Andersen and Stenderup 1956; Montreuil 1955), but has been increasing with the growing use of antibiotics and steroid therapy in modern medicine (Symmers 1966; Torack 1957; Keye and Magee 1956; Osborn 1963). The rise in the recorded incidence has also been attributed partly to the greater awareness of deep mycotic infections and a corresponding increase in the requests by clinicians for mycological examinations (Symmers 1966). The following is the first case of an aspergilloma of the upper respiratory tract to be recorded in Nigeria.

Case History

A male student aged 22 years complained of intermittent nasal obstruction, occasional headaches and pyrexia of about eighteen months’ duration. He also had frequent bouts of sneezing accompanied by nasal discharge which varied from being profuse and watery to mucopurulent. The nasal obstruction had in the past few months become persistent but there had been no pain or epistaxis. He had been otherwise quite healthy and had never had prolonged treatment with antibiotics or any other drugs.

On examination, he was found to have, in the left ethmoidal region, an irregular fleshy mass which felt firmer than a simple polyp. It was not mobile and did not bleed when gently manipulated. There was no external deformity of the nose or cheek and no evidence of involvement of the orbit. Radiography of his paranasal sinuses showed clouding of the left ethmoids but no definite evidence of bony destruction. The other sinuses appeared healthy. Routine haematological examination and urinalysis gave normal results.

Surgical approach to the tumour was by the intranasal route and bleeding during the operation was no more than might have been expected from a simple polypectomy. The mass excised was about one inch long and half an inch thick; it was very firm and had a granular surface. The post-operative period was uneventful and after two days the patient went to his home 600 miles away.

Pathology

The tissues received were inflamed and oedematous. Sections stained with haematoxylin and eosin and periodic acid schiff showed several micro-abscesses (Fig. 1) and granulomata. The abscesses consisted of small and large collections of polymorphonuclear leukocytes and a few eosinophils. They were usually surrounded by the granulomata which consisted of multinucleated giant
FIG. 1.
A micro-abscess surrounded by a chronic granulomatous reaction. (H. & E. × 160.)

FIG. 2.
Granulomatous area. In the centre of the field there is a giant cell containing two hyphae in cross section which appear as unstained spaces. (P.A.S. × 400.)
Clinical records

**FIG. 3.**
Methenamine silver stain showing numerous hyphae in the granulomatous area but practically none in the micro-abscesses. (× 130.)

**FIG. 4.**
A higher magnification showing irregular branching hyphae. (Methenamine—silver × 530.)
cells, epithelioid cells and lymphocytes. Some of the micro-abscesses showed central necrosis. Plasma cells were found scattered throughout the sections. There was moderate fibroblastic proliferation in some areas and frank fibrosis in others. Some sections showed bone necrosis.

In and around the giant cells were seen occasional very poorly defined bodies in cross and longitudinal sections, some of them containing indefinite irregular shrunken intra-luminal material (Fig. 2). They were suggestive of foreign bodies or fungal elements.

In sections stained with silver methenamine, numerous hyphae were easily seen (Fig. 3). They were predominant in the granulomata and were scanty or absent in the central necrotic areas of the micro-abscesses. The hyphae were septate, irregular in size and were branched (Fig. 4). Some showed intracalary and terminal enlargements.

In view of these findings, a second operation was performed when the patient returned three months later. This was done partly to obtain a specimen for mycological examination and also to ensure as complete a removal of the lesion as possible. At this second operation very little abnormal tissue was found but this was sufficient for demonstration and culture of the fungus.

**Mycology**

Two pieces of tissue were received for mycological examination, one from the upper part of the left anterior ethmoidal area and the other from the ethmoidal wall adjoining the left antrum. Microscopic examination of a small portion of tissue from both biopsies after digestion with potassium hydroxide showed moderate numbers of hyphal fragments. Cultures on Sabouraud's dextrose agar at room temperature and at 37°C yielded profuse growths within three days. The colonies which were at first white and fluffy soon developed a lime green colour in the centre and this rapidly spread throughout the colony, becoming darker with age.

The gross and microscopic appearances of the colonies were consistent with those of the *Aspergillus flavus-oryzae* group. A culture of the fungus was sent to Dr. I. G. Murray of the Mycological Reference Laboratory in London who identified it as *Aspergillus flavus*.

**Comment**

The mode of onset of this lesion is unknown and no precipitating or predisposing factors have been discovered. Fungi of the Aspergillus species have been isolated from the nasal secretions of some people who have shown no evidence of infection by the fungus (Tetu *et al.*, 1964; Sandison *et al.*, 1967; Seabury and Samuels, 1963; Savetsky and Waltner, 1961), and have also been found growing in unhealthy and necrotic tissues (Seabury and Samuels, 1963; Symmers, 1966; Sandison, 1967). In addition to this passive role, they have on occasion assumed pathogenicity when the defence mechanisms of the host are prejudiced by debilitating disease or prolonged antibiotic or steroid therapy (Torack, 1957; Zimmerman, 1955). On the other hand, as in the case just described, they have sometimes been responsible for primary infection even in the absence of any recognizable predisposing factors in the host. In such cases, the reason for the altered pathogenicity is not understood.
Clinical records

The infection in the upper respiratory tract may mimic features of vaso-motor or suppurative rhinitis, sinusitis, nasal polyposis or an invasive and destructive neoplasm (Hora, 1965; Weller et al., 1960; Keye and Magee, 1956; Osborn, 1963). These features might easily lead to misdiagnosis and ineffectual treatment if the mycological etiology of the lesion were not suspected or examined for.

The drugs tried topically or systemically in the treatment of this condition have, in the opinion of some observers (Andersen and Stenderup, 1956; Weller et al., 1960), so far proved to be of doubtful value. Greater reliance has therefore to be placed on adequate excision and drainage. No medical treatment has been given in the case presented as it is felt that the lesion has been completely removed. The patient has been followed up for 9 months and has so far shown no evidence of recurrence. A much longer period of observation will however be necessary before it may be assumed that he is cured, particularly as the predisposing factors of this infection are unknown and the pathogenicity of the fungus is unpredictable.

Summary

The first recorded case of an aspergilloma of the upper respiratory tract in Nigeria is presented with the histopathologic and mycological findings which led to its diagnosis. This lesion does not appear to be opportunistic and no precipitating factors can be found. Misdiagnosis of aspergillus infections is often likely due to their mimicry of other upper respiratory tract lesions and their comparative rarity. Treatment in the case presented has been by surgical excision only since the efficacy of antifungal drugs used for this condition in this site has so far been doubtful.

REFERENCES

Schubert, P. (1885) Deutsches Archiv für Klinische Medizin, 36, 162.
Torack, R. M. (1957) American Journal of Medicine, 22, 872.
Zarniko, C. (1911) Deutsche Medizinische Wochenschrift, 17, 1222.

University of Ibadan,
Ibadan,
Nigeria.