PARAPLEGIA DUE TO ASPERGILLOSIS
SUCCESSFUL CONSERVATIVE TREATMENT OF TWO CASES
BARRY FERRIS, CLEDWYN JONES

From Westminster Children’s Hospital, London

Aspergillus infection of the spine is rare; for it to lead to paraplegia is still more rare. When this does occur it is usually treated by decompression and antifungal agents, but the results have usually been poor. We report two cases of successful conservative treatment of Aspergillus paraplegia in patients with chronic granulomatous disease.

Infection by fungi of the genus Aspergillus is uncommon in man. The usual site of infection is the lungs but spread to other organs can occur and there have been reports of intervertebral disc infection, vertebral osteomyelitis and extradural abscess. There have been very few reports of paraplegia secondary to Aspergillus infection and, in a search of the literature, we have found no report of successful conservative treatment of this condition. We report two cases of Aspergillus paraplegia which responded to antifungal treatment.

CASE REPORTS

Case 1. A six-year-old boy was referred to the Westminster Children’s Hospital for a bone marrow transplant. He was an adopted child who, at the age of six months, had developed osteomyelitis of the occipital bone after a trivial graze. Thereafter he suffered from multiple infections, requiring antibiotics and surgical drainage, until, at the age of 15 months, chronic granulomatous disease was diagnosed. A further series of infections followed and at the age of five years he developed a right-sided empyema with a subphrenic extension. This was aspirated and Aspergillus fumigatus was cultured. He was treated with clotrimazole and emetine, but this failed to eradicate the infection and at the age of seven years osteomyelitis of the upper thoracic vertebrae was diagnosed (Figs 1 and 2). He received a bone marrow transplant with amphotericin antibiotic cover, but the transplant was unsuccessful.

At the age of eight he presented with incontinence; he was found to have paraplegia with sparing of sensation and a bilateral extensor plantar response. He had multiple discharging sinuses on his back and he was almost moribund. He was treated with intravenous amphotericin (0.25 mg/kg bodyweight daily rising to 1 mg/kg daily) and the paraplegia slowly improved until, three months later, the only residual abnormality was a foot drop.

At the latest review when he was aged 14 he had had a number of further infections, but there was no abnormal neurology; his vertebral infection and his sinuses were quiescent (Fig. 3).

Case 2. An adopted Italian boy suffered from recurrent infections since infancy. At the age of five years he presented with pneumonia of the upper lobe of his right lung and an abscess of the right side of his chest wall. The abscess was drained and culture of the pus grew Aspergillus fumigatus and Aspergillus niger. He was treated with amphotericin B and 5-fluorocytosine. Further investigations revealed that he had chronic granulomatous disease and, after granulocyte transfusion, he was referred for a bone marrow transplant. On admission he had paraplegia, with sparing of sensation and sphincter control, and a bilateral extensor plantar response. Radiographs showed collapse of several upper thoracic vertebrae (Figs 4 and 5) and a myelogram revealed an extradural block (Figs 5 and 6). He was treated with intravenous amphotericin B at maximum doses (1 mg/kg daily) for three months and then with oral miconazole (1 g daily). The weakness improved after eight days and by the fourth month he was able to walk. He was fitted with a brace and by the seventh month had regained full function; the only remaining abnormality was a bilateral extensor plantar response.

Four years later he was well with no abnormal neurology (Fig. 7).

DISCUSSION

Infection by Aspergillus is rare. The fungus usually only becomes invasive in the presence of debilitating disease, although there are reports of patients in whom there was
Case 1. Figure 1—This patient had destruction of several upper thoracic vertebrae. The second and third right ribs show lytic areas and are expanded. Figure 2—Lateral tomogram of upper thoracic vertebrae showing sclerosis and lytic areas; note the absence of sequestrum formation. Figure 3—Radiograph eight years after presentation.
Case 2. Figure 4—Radiograph showing destruction of upper thoracic vertebrae. Figures 5 and 6—Myelogram showing an extradural block from the fifth thoracic vertebra (Fig. 5) to the sixth cervical vertebra (Fig. 6). Figure 7—Radiograph four years after presentation.
no underlying cause (Grossman 1975; Seligsohn, Rippon and Lerner 1977). Many species of *Aspergillus* have been described as pathogenic, such as *A. fumigatus*, *A. niger*, *A. flavus*, *A. nidulans* (Bujak, Kwon-Chung and Chusid 1974; Grossman 1975) and *A. terreus* (Seligsohn et al. 1977); of these *A. fumigatus* is the commonest.

Predisposing factors include neoplasia, cardiac surgery and radiotherapy. Several reports imply a link between infection and the use of oral contraceptives, addictive drugs and intravenous catheterisation (Seligsohn et al. 1977; Convent, Van de Meirop and Blijweert 1979). Patients on immunosuppressive therapy also are at risk (Byrd, Weiner and McGee 1982), as are diabetics (Mawk et al. 1983). In addition, there have been reports of infection during pregnancy (Dietz et al. 1982) and in patients with chronic granulomatous disease (Bujak et al. 1974; Tack et al. 1982).

The organism usually gains entry via the lung, causing pneumonia, although it may lie dormant only to become active later, as reported in a patient who developed paraplegia during pregnancy (Dietz et al. 1982). In the presence of pneumonia, dissemination to the heart, kidney and gut is said to occur in 25% of cases, but infection rarely spreads to bone (Seligsohn et al. 1977). Haematogenous spread occurs in adults, but in children spread to bone is usually by direct invasion from the lung (Grossman 1975; Tack et al. 1982) as happened in our two cases.

Clinically *Aspergillus* infection of bone results in sinus formation from which the fungus may be cultured, though sometimes with difficulty. Radiologically there is dense new bone with small lytic lesions and a notable absence of sequestration (Convent et al. 1979), features which were present in our two cases.

Reviewing the literature we could find no report of *Aspergillus* paraplegia which was successfully treated conservatively. Ten cases of *Aspergillus* infection of the spine in adults have been reported, all treated by posterior decompression and antifungal agents. Six were primarily disc infections; four recovered (one of whom had a paraplegia which resolved) and two died (Grossman 1975; Seligsohn et al. 1977; Convent et al. 1979; Mawk et al. 1983). Four patients with epidural abscesses all had paraplegia which did not improve despite treatment, and one died (Seres, Ono and Benner 1972; Byrd et al. 1982; Dietz et al. 1982; Chee and Poh 1983). Clearly, in adults paraplegia from an epidural abscess carries a poor prognosis.

In children, of five reported cases of *Aspergillus* infection of the spine without paraplegia four died (Bujak et al. 1974; Tack et al. 1982). These children had chronic granulomatous disease. This is a recessive X-linked deficiency of the enzyme myeloperoxidase, an enzyme needed for destroying peroxide-producing organisms such as *Staphylococcus aureus* and *Aspergillus* spp. This results in granuloma and abscess formation.

Several antifungal agents are now available, including amphotericin B, 5-fluorocytosine, clotrimazole, ketoconazole and miconazole (Convent et al. 1979). Some of these, such as amphotericin B, are toxic, so that renal and hepatic function need to be monitored whilst treatment continues.

In conclusion, we believe that *Aspergillus* is a rare cause of paraplegia, but with a significant mortality. The outlook in adults appears to be poor, but in children conservative treatment with antifungal agents can be successful.

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REFERENCES


