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Clinical Records

Malignant otitis externa due to Staphylococcus infection

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A case of malignant otitis externa occurring in a fit 25-year-old non-diabetic male is reported. The clinical and histological findings support this diagnosis but neither identification nor culture of Pseudomonas aeruginosa was made and the condition was bilateral. The only pathogen identified was Staphylococcus aureus which has been reported in only two previous cases.

Case report

An otherwise healthy 25-year-old male presented with a four-month history of bilateral odourless otorrhoea. This was associated with a variable hearing loss and occasional sharp otalgia. Aural examination revealed moderately severe, bilateral otitis externa with reddened tympanic membranes. A slight conductive hearing loss was demonstrated on pure tone audiometry but normal middle-ear pressures were found on tympanometry. His family doctor had been treating him with oral ampicillin and topical Otosporin ear drops. He was treated as an In-patient with daily Tri-Adcortyl ear wicks. A swab produced Staphylococcus albus and diptheroids but both were considered to be commensals. Although his symptoms resolved over the next two weeks, exposed cartilage appeared on the floor of the right external auditory meatus. He was then started on aural gentamicin and systemic cotrimoxazole. A further swab yielded coagulase-positive Staphylococcus aureus.

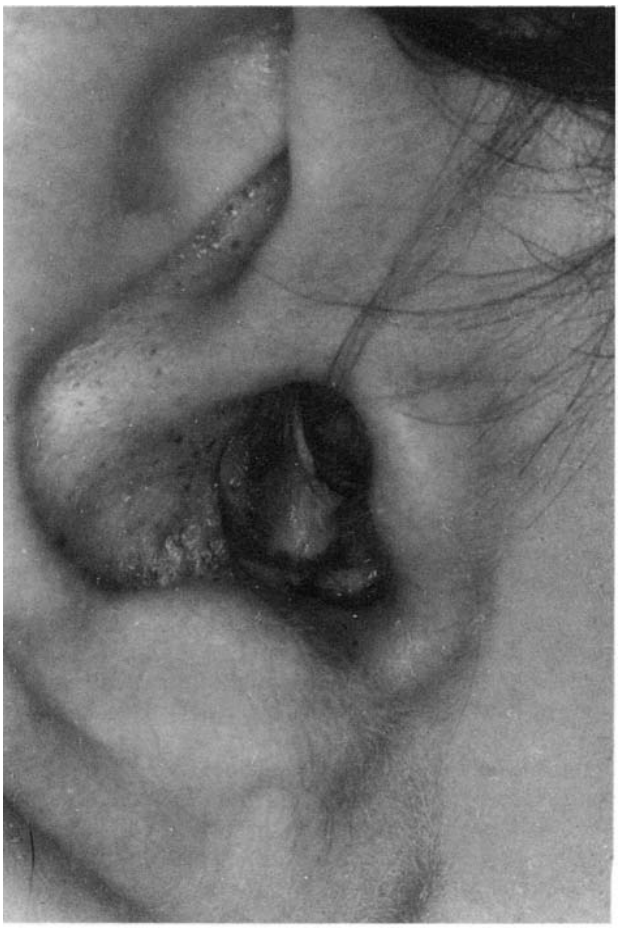


FIG. 1
Right external auditory meatus showing necrotic cartilage during the healing phase.

Acid fast bacilli were neither identified or cultured. Further investigations revealed an ESR of 1 mm. per hour and normal total and differential white cell counts. A full glucose tolerance test showed no abnormality. Examination under anaesthesia confirmed that 75% of the circumference of the external canal was exposed cartilage (Fig. 1). Biopsies were taken twice during the next two weeks. Pathologists from local and two national centres have since reported on these biopsies. The microscopic picture was that of widespread necrosis of bone, skin and cartilage in both ears. There was hyperplasia of the epidermis associated with acanthosis but this was considered to be a reaction to the underlying inflammatory change rather than of primary significance. Gram-positive cocci were identified. An inflammatory infiltrate was seen in only one of the five biopsies. The histological appearances were confirmed by an eminent pathologist to be those of malignant otitis externa. Immunological studies, including a complement profile, serological tests for rheumatoid factor, anti-nuclear factor and antibodies to extractable nuclear antigens, were all normal. Over the next few months various topical solutions including aqueous eosin, five per cent acetic acid and mercurochrome were applied with a gradual improvement in appearance. Before the final pathological opinions were available, the condition of relapsing polychondritis had been considered a possibility and, therefore, a trial of prednisolone was given. This resulted in a rapid deterioration and was discontinued. After three months of topical treatment the cartilage was covered with a thin layer of skin. It was not until 14 months after presentation that the appearance of the external canals returned to normal. This recovery has now been maintained for 18 months.

Discussion

The patient we describe had the clinical and pathological features of malignant or necrotising otitis externa. The surpris-

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ing finding was the failure to identify or culture Pseudomonas from the ear and the demonstration of coagulase-positive staphylococci. Classically, the disease is found in elderly diabetics, with progressive tissue necrosis in association with a severe pseudomonal otitis externa. Following the initial single case report by Meltzer and Kelemen in 1959, the first series was presented by Chandler in 1968. Although elderly diabetics still characterise 90 per cent of cases (Zaki *et al.*, 1976; Doroghazi *et al.*, 1981), there have been cases reported in non-diabetics (Shannon *et al.*, 1972; John and Hopkin, 1978; Soliman, 1978) immunocompromised patients (Rubinstein *et al.*, 1980) and children as young as five months (Coser *et al.*, 1980). The diagnosis of malignant otitis externa cannot be excluded on the basis of age or general health. The diagnostic criteria were reviewed in a study by Cohen and Friedman (1987). Having analysed all previously documented cases they proposed the following diagnostic criteria: a severe otitis externa with either a positive bone scan or which fails to respond to local treatment for at least one week, accompanied by pain, oedema, exudate, granulations and microabscesses. They were uncertain whether a positive culture or identification of Pseudomonas should be included. Babiatzki and Sade (1987) in a review of 50 cases are similarly inconclusive. There have been three cases that have not yielded Pseudomonas on culture from a total of 150 cases documented (Prasad 1976; Bayardelle *et al.*, 1982; Babiatzki and Sade, 1987). The latter two reports each included a case which cultured Staphlyococcus aureus as the sole pathogen. If the diagnosis of malignant otitis externa is rejected because of the failure to identify Pseudomonas, then what are the alternative possibilities? There was no pathological nor laboratory evidence for any of the specific granulomatous conditions. The main differential diagnosis is relapsing polychondritis. Different criteria for making this diagnosis are reported. Dolan *et al.* (1966) states that a firm diagnosis requires evidence of cartilage involvement in at least two sites, however, Michet *et al.* (1986), Arkin and Masi (1975), and McAdam *et al.* (1976) accept only one site of cartilaginous involvement if at least two of the following are also present: ocular inflammation; sensori-neural hearing loss; vestibular dysfunction; seronegative arthritis. Our case fails to satisfy these criteria. The histologic findings in relapsing polychondritis are loss of the basophilic staining, replacement fibrosis and inflammatory cell infiltrate (McAdam *et al.*, 1976). Loss of basophilic staining was the only such change identified and, therefore, both histological and clinical evidence for the diagnosis of relapsing polychondritis was lacking. The deterioration which followed the trial of steroids suggests an infective rather than inflammatory process. We, therefore, conclude that our patient suffered from a necrotising or malignant otitis externa in association with a Staphylococcus aureus infection and that the presence of Pseudomonas is not an essential finding in this condition.

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