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External otitis: Otological problems

G. D. McDOWALL (Edinburgh)

Introduction

EXTERNAL otitis became an important otological problem during the years of the Second World War, not so much because of any remarkable changes in its character but because of its high incidence and often severe symptoms occurring in Services personnel in various theatres of war, particularly the Middle and Far Eastern ones. During those years many British otologists recounted their experiences of the disorder in differing climatic conditions and with personal appreciation of the difficulties in its management. The interest which their reports aroused stimulated investigations of its aetiology and many of the conclusions reached and observations made at the meeting of this Section in March 1950 remain as valid today as they were then. It is interesting to recall that the ensuing discussion on that occasion was opened by a member of the Section of Dermatology who was surprised to hear that antibiotics, notably penicillin and the sulphonamide group of drugs, could be used in otitis externa since there was a distinct risk of producing local sensitisation.

If any one should have doubts of the value of consultation with our dermatological colleagues, a study of the Annual Address entitled 'The Association between Dermatology and Otorhino-Laryngology' delivered to the Institute of Laryngology and Otology in 1955 by Mr. F. C. W. Capps, should dispel them. His address not only indicates that our specialties have much in common it also has a theme which we may too easily lose sight of in clinical practice, the necessity to examine and treat the whole patient. In an earlier period Ewart Martin (1938) observed that 'otitis

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externa is purely a skin complaint which, but for the curiosity of its position, would come under the care of the dermatologist'. This observation was made at a meeting of the Section of Otology to discuss Otitis Externa, at which speakers emphasized the importance of treating the scalp condition accompanying otitis externa, of clearing the meatus including the anterior meatal recess and the danger of over-treatment. Some of the conditions referred to, such as croupous otitis externa and gouty otitis externa must now be rarities. On the other hand, problems of diagnosis and management remain with us.

Incidence

Otitis externa continues to be one of the commonest disorders encountered in an Ear, Nose and Throat department and those concerned with the medical care of Service personnel in warmer climes can expect a high rate of morbidity. Ackroyd (1959) recorded a yearly rate of 60 cases of acute otitis externa per thousand in such individuals.

Classification

Older and simpler classifications of otitis externa into localised and generalised forms took insufficient account of its many causes and the interplay of the various factors such as secondary infection and sensitisation. The more comprehensive classification suggested by Mawson (1967) of an Infective group due to bacterial, fungal or viral agents and a Reactive group presenting commonly as eczema, seborrhoeic dermatitis or neurodermatitis, offers a broader picture of the disease and its treatment.

Aetiology

The introduction of infection can occur in numerous ways, but very often scratching and poking the ears with dirty fingers or contaminated objects such as a matchstick, Kirby grip or dirty instruments, is the mechanism by which pathogenic organisms invade the meatus. Syringing the ear for the removal of hard wax may damage the skin lining the external meatus, permitting organisms to penetrate the barrier of the stratum corneum, an invasion which is facilitated if a meatus is not adequately dried after syringing. Badly-fitting and infrequently cleaned hearing aid ear-moulds are a potential source of trouble and self-introduced pledgets of cotton-wool, forgotten and disintegrating, may cause a severe reaction. In any inflammatory reaction of the external meatus the possibility of primary middle ear disease should be remembered. In other cases the primary factor is allergic and all too often there is a combination of infection and allergy. Development of skin allergy may be due to a large number of antigens and there was a period in otological practice when sensitivity to locally applied antibiotics was a common cause of an

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acute reaction of the meatal skin and mastoid cavities resembling a diffuse otitis externa. Preparations containing penicillin, chloramphenicol and neomycin are the common offenders in the production of reactions and the latter has been alleged to have an ototoxic effect even when applied topically. The intense itching which accompanies sensitisation soon leads to secondary infection by scratching and rubbing. The elimination of bacteria by topical antibiotics may leave a free field for the development of mycotic infection in which itching is also a troublesome symptom.

Bacteriology

Studies of the bacteriology of the external meatus (Stewart, 1951), have shown that normally it is sterile in 30 per cent of individuals, but in 50 to 60 per cent staphylococcus albus alone or combined with other non-pathogenic organisms is obtained on culture. Less often staphylococcus aureus or non-haemolytic streptococci are found. In otitis externa the bacteriological flora is often mixed with staphylococcus aureus and gram-negative organisms such as pseudomonas pyocyaneus, proteus vulgaris and Escherichia coli present. Some variations of the proportions of these organisms occur with differing areas and pseudomonas pyocyaneus infections have been observed to be commonest in tropical and sub-tropical regions.

Symptomatology

There are no special problems in regard to the symptoms and signs occurring in external otitis except on few occasions the necessity to exclude the presence of underlying middle ear disease. Severe earache at the outset is characteristic of furunculosis and aural herpes, but in acute diffuse otitis externa it is preceded by a hot burning sensation and a thin serous discharge which becomes thicker and purulent.

The reactive types of otitis externa such as seborrhoeic dermatitis, drug sensitivity and neuro-dermatitis are associated with itching which is also present in otomycosis, with resulting secondary infection and tendency to recurrences. Deafness is directly proportional to the obstruction of the meatus caused by oedema or accumulated debris and discharge, provided there is no underlying disease of the middle or inner ear in which case deafness may be more pronounced. Less commonly in cases of chronic stenosing external otitis resulting from long-standing diffuse otitis externa deafness may result from extreme narrowing of the meatus, from fibrous thickening of the drumhead and from web formation. In these cases of chronic eczema the appearance of the meatus and auricle may vary from a scaly dermatitis to marked lichenification and to a condition best described as elephantiasis. Skin fissures at the introitus of the meatus and in the retro-auricular groove with surrounding erythema are often present in cases of seborrhoeic dermatitis and eczema.

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Management

It has been said that there is nothing new in otitis externa, but it is often valuable to restate the fundamental principles in the management of these cases particularly when so many of them are referred to hospital because of the failure of previous treatment and the frequency of recurrences. In all but a few continued treatment by a doctor or nursing staff with special experience is required if a satisfactory result is to be obtained. Too many patients are seen whose treatment has consisted of instructions to keep the ear clean, to prevent water from entering the ear canal and to instil the prescribed number of drops 'x' times daily. Toilet of the ear should not be left entirely to the patient or relatives to perform. Inadequate dry-mopping of the ear is more likely to inpact the accumulated epithelial debris or to cause further trauma to the meatal skin and the regular addition of drops or of ointments is merely adding fuel to the fire.

In the special situation of the external meatus cleansing of the skin condition is of paramount importance and it is essential that the lumen should first be cleansed of all discharge and epithelial debris in order that the drumhead may be clearly seen and to permit local applications to come into contact with the irritated skin of the meatus. Skill and gentleness are required particularly in removing residual debris from the anterior meatal recess (Fig. 1).

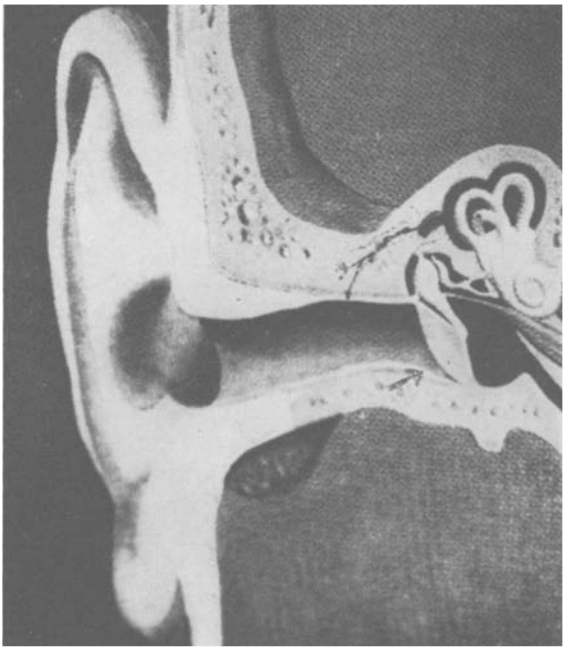


FIG. 1.
Section of ear showing meatal recess.

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Repeated examination is necessary during treatment to ensure that the meatus remains clear and does not become 'clogged' by a mixture of discharge, desquamated epithelium and therapeutic agent. Failure to do this results in lack of improvement and deafness.

Further principles and objectives in management are concerned with establishing the diagnosis, eliminating the possibility of middle ear disease, local treatment of the ear and examination of other areas particularly the scalp and upper respiratory tract.

Diagnosis

In general, diagnosis presents few problems to the experienced otologist but there are some conditions in which the possibility of primary acute or chronic otitis media cannot be immediately excluded. One of these, perhaps seen less frequently nowadays, concerns the differentiation between furunculosis of the external meatus with cellulitis and acute otitis media with mastoiditis. A similar clinical picture, personally encountered, arose from an acute exacerbation of chronic otitis media with cholesteatomatous destruction of the posterior bony meatal wall causing an acute diffuse otitis externa and post-auricular oedema.

The condition which has been called otitis externa granulosa occurs with varying degrees of granulation formation in the external meatus in the presence of an intact drumhead and normal middle ear. It is, perhaps, not uncommon to encounter patients with a few small granulations in the deeper part of the meatus and on the drumhead where the ear condition has been neglected, accumulated infected debris has lain in the external meatus for a lengthy period and there is often a foul-smelling purulent discharge. This form of otitis externa was reported by Moffett (1943) and Clark (1946), both of whom encountered it in India, and Punt (1949) described thirteen cases seen in a twelve months period whilst on service in Austria and North Italy. Most of his cases were seen during the hot weather and swimming seemed to be an aetiological factor. These cases are, however, not confined to tropical and sub-tropical climes. They are, from time to time, encountered north of the border where prolonged hot weather is not usual and swimming is a less likely aetiological factor, though it cannot be excluded with the increasing pollution of coastal and particularly estuarial waters.

When granulation tissue is seen in the meatus it is natural to suspect chronic otitis media and it would be wise to continue to suspect its presence until it can be excluded by every available means. In many cases destruction of granulations is essential before normal drumhead landmarks can be seen and its integrity verified. The use of a pneumatic speculum is essential and any mucoid content in the aural discharge is suggestive of underlying middle ear infection.

Removal of granulations can be achieved by scrupulous toilet of the

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meatus, the use of spirit drops, and minimal application of trichloracetic acid to the granulations.

Chronic otitis externa

This type of infective otitis externa may be the precursor of the chronic stenosing variety which may also result from injury or surgery, resulting firstly in thickening of the drumhead or in web formation and in some cases a later diffuse thickening of meatal skin by extensive infiltration of fibrous tissue.

Two such cases have been encountered within the past year. The first, was a complete web situated medial to the isthmus in the right ear of a man of 60 years who had a long history of recurring attacks of otitis externa and whose left ear contained a few granulations in the deep meatus with evidence of active infection which responded to packing of the meatus with ribbon gauze wicks impregnated with an antiseptic cortisone ointment. The patient had reported on account of increasing deafness which was more severe in the right ear. Audiometry showed a high-tone deafness in both ears and a conductive loss on the right side. After a period of observation to ensure the absence of active infection, surgical excision of the web was performed by means of a circumferential incision proximal to the web and within the bony meatus. Elevation of the sleeve of tissue was continued to the level of the tympanic ring at which a thickened drumhead was recognisable and from which the fibrous web was dissected. During the course of the elevation a small exostoses on the posterior meatal wall close to the tympanic ring was found and removed. Skin grafting was not performed. The meatus was packed with Sterispon and a petroleum jelly wick, the former being left in position for ten days. Healing took place without recurrent stenosis and audiometry showed a 15-decibel gain in the lower frequencies.

The second patient, a very overweight woman of 39 years, was referred on account of intermittent irritation and discharge affecting both ears for at least five years, also periods of deafness. Examination showed bilateral stenosing otitis externa with a pin-hole meatus and a firm cyst-like swelling situated in the cavum conchae of both auricles, that on the left side being larger and encroaching on the introitus of the meatus. This swelling involving skin only was excised without division of the perichondrium and the resulting raw area healed rapidly. Histological examination showed a mass of young cellular fibrous tissue focally infiltrated by lymphocytes, macrophages and plasma cells. The pathologist also observed an excess of basal cell activity at the apex of each of the rete ridges suggestive of incipient basal cell carcinoma. It was doubtful, however, whether any invasion of the dermis had occurred.

This problem was resolved by Dr. Peterkin who later examined the patient and reported the condition as the type of recurrent streptococcal

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lymphangitis known as erysipelatoid. On his advice long-term antibiotic therapy with Lincomycin was commenced together with appropriate topical measures to both auricles. Initially both ears improved and it was hoped that meatoplasty could eventually be performed on each ear. Unfortunately this stage has not yet been reached on account of relapses due at least in part to the patient's failure to persevere with the treatment.

These are but two examples of the fortunately less common types of chronic otitis externa which is more often seen as a dry desquamative state of the meatal skin with accumulations of epithelial debris causing intermittent deafness and periods of itching or irritation leading to scratching, re-infection and exacerbations of the acute stage. Not infrequently this form of recurring or persistent otitis externa is initially of the reactive group having its origin as a seborrhoeic dermatitis of the scalp (Figs. 2 and 3).

Acute otitis externa

It is, however, the acute form of diffuse otitis externa, whether infective, reactive or mixed, which presents, in a universal context, most of the problems of management. Whether it be the 'hot-weather ear' described by Morley in 1938, the many local appellations or the less acute variety encountered in non-tropical areas, which concern us, many manifestations common to all are present and treatment requires the application of the same basic principles. Symptoms and signs of this condition require no elaboration here but a restatement of measures both preventive and curative may be of value.

Stride (1959) reporting on his experience of the condition in Germany and Cyprus advocated certain prophylactic measures which he summed up as consisting of keeping the ears dry, avoiding local trauma, maintaining a high standard of personal hygiene and treating skin disorders. To this advice may be added more general measures consisting of the removal of septic foci such as may be present in teeth, tonsils or sinuses, of allergic conditions particularly of the contact variety and the correction of endocrine causes such as hypometabolic states and diabetes.

Concerning treatment, McLaurin *et al.* (1964) pointed out that the objective is the restoration of the external canal to its normal anatomical and physiological state and to that end apply certain basic principles: (i) relief of pain; (ii) thorough cleansing of the meatus; (iii) the discriminating use of specific medication; (iv) the termination of treatment as promptly as possible; and (iv) the removal or control of predisposing causes. These principles are well known but often inadequately applied, and there is a necessity to treat cases individually. For the otologist there are, however, methods of local treatment which are constantly of value. The 12 mm. gauze wick packed into the external meatus remains the most effective means of bringing medication into contact with inflamed

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meatal lining, if properly inserted. Of the solutions employed, 8 per cent aluminium acetate remains an effective method of bringing an acute diffuse otitis externa in the wet stage under control, and 10 per cent Ichthyol in glycerine is particularly useful in the inflamed oedematous meatus. Either of these solutions may be used as wet dressings to the entire auricle if necessary. The risk of sensitisation accompanying the premature use of antibiotic preparations is now appreciated within our specialty,



FIG. 2.
Case 3. Seborrhoeic eczema.

but perhaps not so well recognised in general medical practice, in which the pressure to prescribe an antibiotic panacea is very high. Of the antibiotic preparations, Terramycin, Framycetin and latterly Gentamycin, have proved to be the most effective depending on the infecting organism. Many of the less severe cases of infective/reactive type are rapidly and effectively treated by means of the broad spectrum antiseptic preparations such as Halquinol and anti-inflammatory steroids triamcinolone acetonide or fluocinolone acetonide.

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External otitis: Otological problems

In the reactive group of otitis externa many patients are seen with non-infective dermatitis the origin of which may only be discovered after much questioning. There can be few otologists who have not observed the acute reaction associated with or resulting from contact with certain antibiotics some of which carry such a high risk of producing sensitisation that they have no place in topical therapy and others which should be

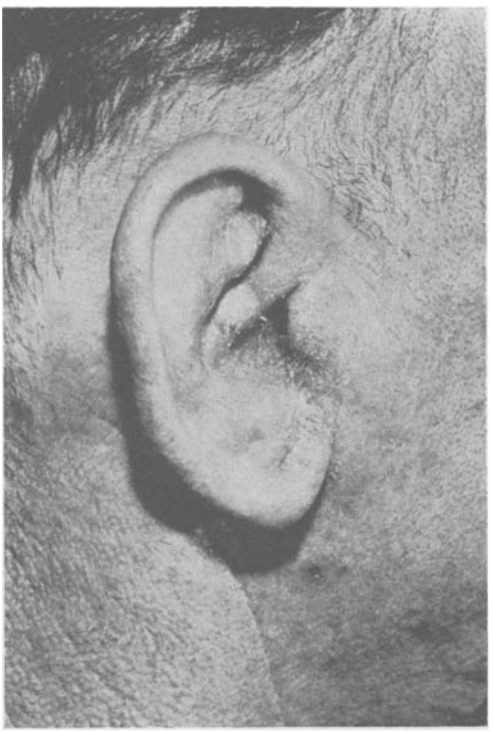


FIG. 3.
Case 3 after treatment with a quinoline-steroid cream and hydrargaphen shampoo.

applied with circumspection. These cases are now met with infrequently but there has been an increase in contact dermatitis involving the ear resulting from hair lotions and particularly from hair-lacquer aerosols of which the following case is illustrative. The patient, a woman of 49, presented with typical symptoms and signs, a feeling of heat, of intense irritation with vesiculation, erythema, oedema and profuse weeping affecting the right ear and adjacent skin following the accidental application of a hair spray to this area a few days previously (Fig. 4). There was a past history of attacks of otitis externa which had been attributed to her hearing aid earpiece which had earlier been transferred to her left ear for which a new individual earpiece had been obtained. Culture of

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a swab from the affected right ear produced only staphylococcus albus. Because of the severe discomfort and reaction she was admitted to hospital and treatment with aluminium acetate applied as meatal packs and as a dressing to the pinna and facial skin was commenced. Two days later the affected areas were virtually dry and treatment was continued with a Betamethasone cream to the pinna and meatal packs. After a further four days the ear had settled completely and the patient was discharged (Fig. 5).

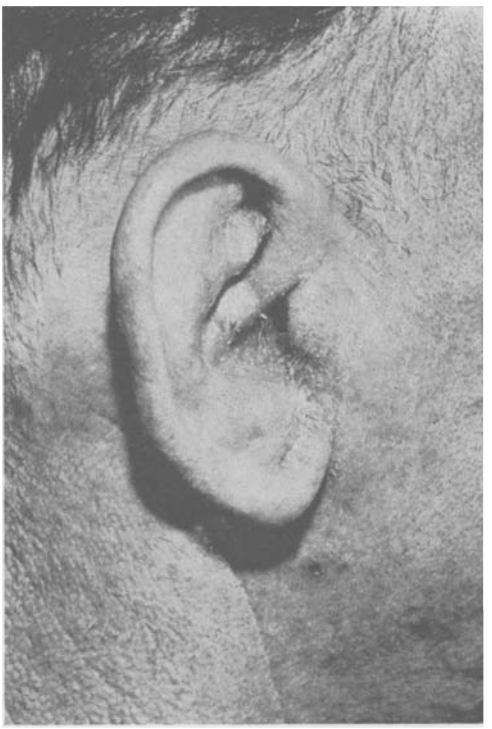


FIG. 4.
Case 4. Non-infective (contact) dermatitis.

Otomycosis

If fungus infection of the ear poses a problem it is usually because the infection has been unrecognised. As a primary infection, it is more common in warm climates but in this country it has chiefly been found as a secondary infection in ears which have been unsuccessfully treated with topical antibiotics. Lumsden (1951) observed that in the records of the Edinburgh Royal Infirmary during the previous ten years only two cases had been found in which a diagnosis of otomycosis was made. Since then the topical antibiotic era has produced a higher incidence of

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cases as reported by Gregson and La Touche (1961), but awareness of the condition and the extensive use of the quinoline preparations, such as halquinol, have reversed the trend.



FIG. 5.
Appearance after further four days treatment with betamethasone cream.

Malignant necrotising otitis externa

The term Malignant external otitis is attributed to Chandler (1968) who reported thirteen cases with a mortality of approximately 50 per cent. A further four cases have been reported by Wilson, Pulec and Linthicum (1971) and two cases were presented to this Section last year by Evans (1972) occurring in this country. Fortunately, the disease has, so far, been uncommon in Britain, since it presents a most serious and challenging problem, but with the increasing resistance of the causative organism, Pseudomonas Pyocaneus, to the older generation of antibiotics, a fact noted by Chandler and probably by many of us, it is possible that more cases will be seen here and it is perhaps justifiable that brief reference should be made to it in this paper, though personal experience is limited to one case.

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The majority of reported cases have occurred in diabetics, usually elderly and the Pseudomonas Pyocyaneus is uniformly responsible. The condition is characterised by increasingly severe pain in the ear and purulent discharge. The presence of granulation tissue in the floor of the canal at the junction of osseous and cartilaginous portions was repeatedly observed by Chandler who considers that infection gains access to the deeper tissues through the normal clefts in the cartilage of the floor of the outer part of the meatus in certain individuals, notably elderly diabetics.

Despite energetic management of the local infection and of the diabetes, the disease is often progressive and surgery is indicated when the infection has spread beyond skin to deeper tissues. Wide surgical excision of all infected tissues is essential but may be ineffective in controlling spread of infection to the temporal bone, base of skull and meninges with fatal result.

Conclusion

Some manifestations of otitis externa and problems encountered in their diagnosis and treatment have been presented. The diagnosis of uncomplicated otitis externa in both acute and chronic stages requires a careful examination to exclude otitis media. Attention must be paid to associated skin conditions requiring a detailed history-taking and inspection beyond the ears.

For the otologist the first principle is to cleanse the meatus and to continue to keep it clean. Except in cases of staphylococcus aureus infections such as furunculosis systemic antibiotics are seldom necessary. The limitations of topical antibiotics have been appreciated. Surgery may be indicated in chronic stenosing otitis externa and in the rarer malignant (necrotising) type. Many cases of otitis externa particularly of the reactive type are difficult to 'cure', persistency in treatment and patience being necessary.

Acknowledgements

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REFERENCES

AKROYD, R. (1959) *Journal of Laryngology and Otology*, **73**, 544.
CAPPS, F. C. W. (1956) *Journal of Laryngology and Otology*, **70**, 59.
CHANDLER, J. R. (1968) *Laryngoscope*, **78**, 1257.
CLARK, J. V. (1946) *Journal of Laryngology and Otology*, **61**, 586.
EVANS, I. T. G., and RICHARDS, S. H. (1973) *Journal of Laryngology and Otology*, **87**, 13.

https://doi.org/10.1017/S0022215100078282 Published online by Cambridge University Press

GREGSON, A. E. W., and LA TOUCHE, C. J. (1961) *Journal of Laryngology and Otology*, **75**, 45.
LUMSDEN, R. B. (1951) *Journal of Laryngology and Otology*, **65**, 33.
MCLAURIN, J. W., RAGGIO, T. P., and SIMMONS, M. (1965) *Laryngoscope*, **75**, 1699.
MARTIN, G. E. (1938) *Journal of Laryngology and Otology*, **53**, 334.
MAWSON, S. R. (1967) 'Diseases of the ear', 2nd ed., p. 224. Arnold, London.
MOFFATT, A. J. (1943) *Journal of Laryngology and Otology*, **58**, 453.
MORLEY, G. (1938) *British Medical Journal*, **1**, 373.
PUNT, N. A. (1949) *British Medical Journal*, **1**, 989.
STEWART, J. P. (1951) *Journal of Laryngology and Otology*, **65**, 24.
STRIDE, R. D. (1959) *Journal of Laryngology and Otology*, **73**, 48.
WILSON, D. F., PULEC, J. L., and LINTHICUM, F. H. (1971) *Archives of Otolaryngology*, **93**, 419.

14 Moray Place,
Edinburgh EH3 6DT.

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