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Malignant external otitis versus acute external otitis

by

DAVID COHEN, M.D., PETER FRIEDMAN, M.D. and AMOS EILON, M.D.
(Jerusalem, Israel)

Abstract

Malignant External Otitis (MEO) and Acute External Otitis (AEO) are clinically very similar in their beginnings. It is important to differentiate between them very early. Bone scanning is the best diagnostic tool. Eight cases of AEO and MEO are herewith presented.

Introduction

Malignant External Otitis (MEO) is a severe penetrating infection of the external ear canal (Chandler, 1968). It bears a 23 per cent–67 per cent mortality rate (Mader and Love, 1982; Meyerhoff *et al.*, 1977), as reported before the new and potent antibotic era, and still causes cranial nerve paralysis in a high percentage (Chandler, 1968, 1977). When treated properly in its early stages, good results can be obtained (Chandler, 1977). In its early stages it is very similar to a severe Acute External Otitis (AEO), but MEO develops into a severe osteomyelitis of the temporal bone, attacking the adjacent cranial nerves (VII–XII), blood vessels and soft tissues, and finally causing death due to widely expanding osteomyelitis of the skull and disseminated septic thrombo-emboli of the brain (Chandler, 1968, 1972). It is therefore very important to make the diagnosis of MEO as early as possible in order to achieve complete cure. We hereby present MEO and AEO cases in order to elucidate the difference.

Case reports

Patient 1

A 76-year-old male patient was hospitalized because of severe pain in the right ear with purulent discharge which had started one month previously. He had been treated with systemic ampicillin and local ear drops containing steroids and broad spectrum antibiotics, but with no improvement. The patient was not diabetic but suffered from ischaemic heart disease and benign hypertrophy of the prostate.

On examination, after clearance of much purulent discharge, a severe edema of the external canal was found, with granulation tissue covering the posterior wall and partially concealing the tympanic membrane. General physical examination was within normal limits with no neurological deficit.

Ear swab culture revealed pseudomonas aeruginosa on the right. Blood analysis showed glucose—3.4 mmol/l (61 mg. per cent), urea, protein and electrolytes within normal limits, blood count WBC–9200, Hct–47 per cent, Hb–15.3 gr. per cent. Urinalysis was normal. A Tc99 bone scan revealed increased uptake in the right temporal bone.

The patient was put on a therapeutic regime consisting of local cleansing of the external canal and instillation of garamycin ear drops, with intravenous administration of garamycin 240 mg/day. Serum garamycin levels were

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within the accepted therapeutic levels. Having shown no improvement after two weeks, surgical excision of the granulation tissue was done and an abscess 2 × 1 cm. was found in the posterior bony canal wall. The patient was put on azlocillin 15 gr/day intravenously. The inflammation slowly receded until, six weeks after excision, the patient was completely healed. The patient has been under ambulatory follow-up for three years during which time two attacks of AEO occurred, one in each side, at about 6-month intervals. Tc99 scans were negative and they responded readily to local treatment.

Patient 2

A 70-year-old male foreign resident was hospitalized because of severe pain in the left ear with edema and purulent secretion which had started two weeks previously. He had not been treated prior to his admission. The patient was known to be diabetic and was treated with glibenclamide tablets, 5 mg/day.

On examination profuse purulent discharge was found with much granulation tissue on the posterior wall of the external canal. Most of the tympanic membrane was hidden beneath the profuse granulations. In addition, there was redness and edema over the left retroauricular region. Complete physical examination was normal. There was no neurological deficit.

Ear swab revealed pseudomonas aeruginosa on culture. Blood glucose level was 13.7 mmol/l (240 mg. per cent), urea 6.4 mmol/l, GPT–4 u/l, GOT–22 u/l, LNH–84, serum protein and bilirubin—normal. Complete blood count showed WBC–8000, HB–12.6 gr. per cent, Hct–38 per cent. Urinalysis was normal. Tc99 bone scan revealed increased uptake in the left temporal region.

The patient was put on a course of treatment which included local cleaning and instillation of garamycin ear drops and intravenous administration of azlocillin 15 gr/day. Having shown no improvement by the end of two weeks, surgical excision of the granulation tissue was done. Azlocillin was continued for three weeks after excision when the patient returned to his country of origin. We have been informed that the patient has healed completely with no additional therapy.

Patient 3

A 54-year-old female patient was hospitalized because of severe pain in the right ear with purulent discharge which had appeared three weeks previously. Local treatment with ear drops had not improved the condition. The patient was known to be diabetic, with blindness due to diabetic retinopathy and peripheral diabetic neuropathy.

On examination there was edema of the right external ear canal with an abscess at the base of the canal and granulation tissue around the abscess. General physical examination was normal except for peripheral neuropathy, with no sense of touch and pain in the legs distal to the knees.

Ear swab culture from the right ear yielded pseudomonas aeruginosa. Complete blood count was normal. Blood glucose levels were 18.5 mmol/l (330 mg. per cent), blood urea 9.5 mmol/l, electrolytes within normal limits. Urinalysis showed moderate glycosuria. Tc99 bone scan showed increased uptake in the right temporal region.

The abscess in the ear canal was drained and local garamycin ear drops were instilled. Systemic intravenous treatment with garamycin 240 mg/day and azlocillin 12 gr/day was initiated. After one month there was no improvement in the ear. Surgical excision of the granulation tissue and posterior bony canal wall was done. The patient was started on piperacillin 8 gr/day. There was improvement on the right side but a little granulation tissue appeared in the left ear. A repeat Tc99 bone scan showed improvement on the right temporal side and no uptake on the left side.

Four weeks after surgery the patient was without pain but with moderate granulation tissue, and she was discharged. Several months after discharge the granulation tissue had disappeared completely.

Patient 4

An 82-year-old male patient was hospitalized because of severe earache in the

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right ear and complete peripheral facial palsy on the right side. He had received no previous treatment. The patient was known to be hypertensive and to suffer from ischemic heart disease. No evidence of diabetes mellitus was found.

On examination, severe edema of the right external ear canal with granulation tissue on the inferior aspect were found. The tympanic membrane was opaque. There was complete peripheral facial nerve palsy on the right. General neurological examination was normal.

Ear swab culture of the right ear yielded pseudomonas aeruginosa. Blood electrolytes, protein and bilirubin were normal with glucose 5 mmol/l (90 mg. per cent). Urea 9.6 mmol/l and blood count normal. Tc99 bone scan showed increased uptake in the right temporal bone region.

The patient was treated with local cleaning and garamycin ear drops together with intravenous garamycin 240 mg/day. After three days this was changed to intravenous azlocyllin 12 gr/day due to a rise in serum urea to 14 mmol/l. After six weeks of treatment the patient was without pain and the inflammatory process had receded. Facial paralysis remained unchanged. The patient has not been seen again but is known to be well despite the complete facial nerve palsy.

Patient 5

A 74-year-old female patient was hospitalized because of severe pain and purulent discharge in both ears which had started 4 weeks prior to her admission. A few days before hospitalization she developed a complete peripheral facial palsy on the right side. She had been treated with ear drops only. The patient was known to be diabetic and was treated with lente insulin, 47 units per day. No other diseases were noted.

On examination, both ears had copious purulent discharge and granulation tissue on the posterior canal walls. Bilateral serous otitis media was clearly seen. The right retroauricular region was red, congested and very sensitive. There was evidence of complete right peripheral facial nerve paralysis and left facial paresis. The rest of the physical examination was normal.

Ear swabs of both ears were positive for pseudomonas aeruginosa. Blood analysis revealed glucose—7.3 mml/l, Na–142 mmol/l, K–3.8 mmol, urea 22.6 mmol/l, total protein 7.3 g/l (albumin 4.2 g/l), creatinine 253 mmol/l, Hb–10.3 g. per cent, Hct–31 per cent, WBC–8800. Tc99 bone scan revealed increased uptake in both temporal bones.

The patient was put on a therapeutic schedule of local garamycin ear drops and systemic intravenous garamycin 240 mg/day. Local excision of the granulation tissue was performed. Two days later serum garamycin levels were found to be 20 μg/ml and treatment was changed to intravenous azlocillin 15 gr/day. Despite this treatment the patient's condition deteriorated and a complete left peripheral facial palsy appeared. An abscess of the left posterior external canal, which appeared at the same time, was drained. Culture of the pus from the abscess yielded hemophilus and klebsiella. According to this finding, treatment was changed to piperacillin 12 gr/day, but no improvement was seen. Despite a decision to operate on the ear, the patient refused any further treatment and discharged herself from hospital. Six months later, the patient died for no apparent reason in another hospital.

Patient 6

A 60-year-old male patient was hospitalized for treatment of severe pain and discharge in the left ear, of two weeks' duration. He had been treated with ampicillin 2 g/day and ear drops with no significant improvement. The patient was known to be diabetic and treated by diet only.

On examination a severe edema of the entire left external canal was found with copious purulent discharge. General physical examination was normal with no neurological deficit.

Ear Swab culture of the left ear yielded pseudomonas aeruginosa. Complete blood count was normal. Serum electrolytes, protein and bilirubin were normal with glucose 6.1 mmol/l (96 mg. per cent). Tc99 bone scan

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showed normal symmetrical uptake in both temporal bones.

The patient was treated with intravenous cephamezine 4 g/day, local suction and garamycin ear drops. After three weeks of treatment the inflammatory process receded completely and the patient was discharged.

Patient 7

A 58-year-old female patient was hospitalized because of severe pain and purulent discharge of the left ear of three weeks' duration. She had been treated with systemic trimethoprim 240 mg/day and sulfametoxazole 1200 mg/day and local ear drops with no improvement. The patient was known to be diabetic and treated with glibenclamide 5 mg., 3 tab/day. The patient was sensitive to penicillin and erythromycin.

On examination, severe edema and granulation tissue at the base of the external canal were found. The retroauricular region was red and tender. General physical examination was normal with no neurological deficit. Ear swab culture yielded pseudomonas aeruginosa and β-hemolytic streptococcus. Blood glucose was 25.6 mmol/l (540 mg. per cent). The rest of the blood analysis was normal. Tc99 bone scan showed normal uptake in both temporal bone regions.

The patient was treated with intravenous cephamezine 3 g/day, local suction clearance and ear drops. After 10 days of treatment the patient was discharged in excellent condition.

Patient 8

A 72-year-old female patient was admitted because of severe pain and redness of the right ear of two days' duration. She had not been treated previously. Patient was known to have osteoarthritis. There was no evidence of diabetes mellitus.

On examination there was redness and edema of the right external canal and auricle. There were vesicles on the right tonsillar pillars. General physical examination was normal with no neurological deficit. Ear swab culture was sterile. Tc99 bone scan showed normal symmetrical uptake in both temporal regions. Blood analysis was normal.

Due to the severe chondritis the patient was treated with garamycin 240 mg/day and azlocillin 15 g/day intravenously. On the third day a complete peripheral facial palsy appeared on the right, with ninth cranial nerve palsy on the right. Concomitantly, vesicles were found on the right auricle.

The patient was diagnosed as suffering from the Ramsay-Hunt syndrome. The antibiotic therapy was stopped and the patient was put on a course of prednisone 30 mg/day. Within five days the local ear sign disappeared but the facial palsy persisted. Facial nerve decompression was not done because of the patient's objection.

Discussion

In the case presented and summarized in Table I, the signs found in the last three cases could have been interpreted as MEO, especi-

TABLE I
SUMMARY OF THE 8 CASES PRESENTED

Case no.	Scan	Diagnosis	Cranial nerves involved	Diabetes	Pseudomonas	Granulation
1	+	MEO	−	−	+	+
2	+	MEO	−	+	+	+
3	+	MEO	−	+	+	+
4	+	MEO	+	−	+	+
5	+	MEO	+	+	+	+
6	−	AEO	−	+	+	−
7	−	AEO	−	+	+	+
8	−	RHS	+	−	−	±

(RHS = Ramsay-Hunt Syndrome).

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ally those which are not noted in the Table: Pain, edema, redness and old-age. It could not be decided easily which was AEO and which was MEO. Perhaps this is not of much importance since all of them were treated by antibiotics intravenously for some time; but the decisions about which antibiotic to use and the duration of treatment were based on a precise diagnosis. We were able to avoid aminoglycosides in those who were not MEO patients. The diagnosis of MEO can be based on the Tc99 scan results. We do not feel that the AEO cases were early MEO cases which improved due to the early treatment because all of them underwent the Tc99 in about the same clinical condition.

A review of the literature supports the accuracy of the bone scan in diagnosing MEO as an early and exact tool for the diagnosis (Parisier *et al.*, 1982).

Conclusion

AEO is sometimes very similar to MEO. The early differentiation between them can be done very successfully by bone scanning which does not fail in the differential diagnosis.

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Address for correspondence:
David Cohen, M.D.,
Department of Otolaryngology,
Bikur Cholim Hospital,
2–5 Strauss St., P.O. Box 492
Jerusalem, Israel 91002.

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