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Malignant otitis externa a review of current literature Difficult to diagnose and troublesome to treat

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Malignant otitis externa a review of current literature

Difficult to diagnose and troublesome to treat

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Authors

Balasubramanian Thiagarajan

Abstract

Malignant otitis externa is a severe debilitating disorder that involves the external auditory canal. The term "Malignant Otitis Externa" is actually a misnomer. It has been coined to indicate the destructive capabilities of this disorder. This article discusses etiopathogenesis, diagnostic problems and various management modalities available to manage the same.

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Balasubramanian T

Introduction:

Malignant otitis externa is an inflammatory disorder involving the external auditory canal caused by pseudomonas organism. Majority of these patients are elderly diabetics. This condition is termed as malignant otitis externa because of its propensity to cause complications. Hence the term malignant must not be construed in a histological sense. This condition was first described by Meltzer and Kelemen in 1959

It was Chandler in 1963 who coined the term "Malignant otitis externa". This condition commonly affects elderly diabetics who have decreased immunity. Studies reveal that it is more common among insulin dependent diabetics. Current literature also reports a few cases of Malignant otitis externa involving infants / young insulin dependent diabetics. The aim of otolaryngologist is to differentiate this condition from that of real malignancy i.e. Squamous cell carcinoma. Currently fluoroquinolones hold lots of promise in managing these patients.

History:

1838 – Toulmousch reported the first case of otitis externa

1959 – Meltzer reported a case of pseudomonas osteomyelitis of temporal bone

1968 – Chandler discussed the various clinical features and described it as a distinct clinical entity
Epidemiology:

The typical patient with malignant otitis externa is an elderly diabetic, with males outnumbering females by twice the number. This could be due to the possibility of males being more prone to secrete wax which are more acidic in nature. Malignant otitis externa is very rare in children; if present it will be associated with malnutrition or HIV infection.

Pathophysiology:

Malignant otitis externa is known to affect the external auditory canal and temporal bone. The causative organism being pseudomonas aeruginosa. These patients are invariably elderly diabetics. This disorder usually begins as otitis externa and progresses to involve the temporal bone. Spread of this disease occurs through the fissures of Santorini and osteocartilagenous junction. This disorder could be caused by a combination of poor immune response and peculiar characteristics of the offending microbe.

Immunity is reduced in patients with:

1. Diabetes mellitus
2. Blood cancer
3. HIV infections
4. Patients on anticancer drugs

Diabetic microangiopathy plays a vital role in the reduction of tissue perfusion causing opportunistic infections involving the area. Rubin identified triggering factor for Malignant otitis externa in more than 60% of cases. He was able to elicit history of attempts at removing wax, use of ear buds etc.

It should also be remembered that diabetic patients have impaired phagocytosis, poor leukocytic response, and impaired intracellular digestion of bacteria. Diabetic patients secrete wax which has less lysozyme content than normal thereby reducing the effectiveness of wax as an antimicrobial agent.

Pseudomonas aeruginosa is a gram negative aerobe with polar flagella. It is found on the skin. It invariably behaves like an opportunistic pathogen. The pathogenicity of this organism is due to ability to secrete exotoxin and various enzymes like lecithinase, lipase, esterase, protease etc. Since this organism is clothed by a mucoid layer it is resistant to digestion by macrophages.

Clinical features:

The patient gives history of trivial trauma to the ear often by ear buds, followed by pain and swelling involving the external auditory canal. Pain is often the common initial presentation. It is often severe, throbbing and worse during nights. It needs increasing doses of analgesics. On examination granulation tissue may be seen occupying the external canal. It often begins at the bony cartilaginous junction of the external canal. Discharge emanating from the external canal is scanty and foul smelling in nature. When the discharge is foul smelling it indicates the onset of osteomyelitis. Ironically the patient does not have fever or other constitutional symptoms.

Otoscopy: Reveals granulation tissue at the bony cartilaginous junction. The ear drum is usually normal. The external auditory canal skin is soggy and edematous.
Cranial nerve palsies are common when the disease affects the skull base. The facial nerve is the most common nerve affected. As the disease progresses the lower three cranial nerves are affected close to the jugular foramen.

Intracranial complications like meningitis and brain abscess are also known to occur.

![Fig. 1: Facial palsy](https://creativecommons.org/licenses/by-nc-nd/4.0/legalcode)

**Malignant otitis externa with lower motor neuron type facial palsy**

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**Spread of infection:**

1. Inferiorly through the stylomastoid foramen to involve the facial nerve.
2. Anteriorly to the parotid
3. Posteriorly to the mastoid and sigmoid sinus
4. Superiorly to the meninges and brain
5. Medially to the sphenoid
6. Spread through vascular channels are also common

**Role of Imaging in diagnosis:**

1. Conventional radiology is of no use in the diagnosis
2. CT scan is useful in assessing bone involvement
3. MRI scan is useful in assessing soft tissue involvement
4. Radionucleotide scan using Technitium 99 helps in the diagnosis. This is really useful during the very early stages of this disorder. Fixation of Technitium correlates with high degree of osteolytic activity which is commonly seen in these patients. This test is highly accurate 100% but its specificity is rather low. Gallium-67 scintigraphy is very useful for prognostic evaluation because of its high specificity.

**Levenson’s criteria in diagnosing Malignant otitis externa:**

1. Refractory otitis externa
2. Severe nocturnal otalgia
3. Purulent otorrhoea
4. Granulation tissue in the external auditory canal
5. Growth of pseudomonas aeruginosa from external canal
6. Presence of diabetes/ Immunocompromised state

**Radiological staging:**

<table>
<thead>
<tr>
<th>Grade</th>
<th>Diagnostic criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>Disease limited to soft tissue not involving bone refractory to standard antibiotic therapy for more than 4 weeks</td>
</tr>
<tr>
<td>II</td>
<td>Earliest form of Malignant otitis externa with involvement of Mastoid bone</td>
</tr>
<tr>
<td>III</td>
<td>Malignant otitis externa extending medially to involve petrous portion of temporal bone</td>
</tr>
<tr>
<td>IV</td>
<td>MOE extending medially to involve the petrous apex or with cranial nerve involvement or spread anteriorly to involve the facial bones, posteriorly to involve the occipital bone, or spread to the contralateral base of skull</td>
</tr>
</tbody>
</table>

**Fig. 2: External canal granulation**

External canal granulation in a patient with Malignant otitis externa **Staging and classification:**

<table>
<thead>
<tr>
<th>Stage</th>
<th>Ga67</th>
<th>TC99</th>
<th>Extent of Disease</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>+</td>
<td>-</td>
<td>Soft tissue (Necrotising Otitis)</td>
</tr>
<tr>
<td>II</td>
<td>+</td>
<td>+</td>
<td>Ear &amp; Mastoid (Skull base osteomyelitis)</td>
</tr>
<tr>
<td>III</td>
<td>+</td>
<td>+</td>
<td>Extensive skull base osteomyelitis</td>
</tr>
</tbody>
</table>

Management: Extensive surgical procedures have failed miserably to cure this condition. The role of surgery is confined to only exclusion of malignancy by biopsy. Wound debridement is a possibility in advanced cases. Medical management: Carbenicillin, Pipercillin, Ticarcillin can be used. Third and forth generation cephalosporins can be used. Ciprofloxacin in doses of 1.5 g – 2.5 g/day in divided doses can be administered for a period of 2 weeks. Gentamycin can also be administered parenterally in doses of 80 mg iv two times a day in adults.

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**Acknowledgements**

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1 Comment

Ammar jaff  
October 4, 2012  
thank you very much drtbalu you are great