



ISSN Print: 2394-7500
 ISSN Online: 2394-5869
 Impact Factor: 8.4
 IJAR 2021; 7(8): 261-264
www.allresearchjournal.com
 Received: 24-06-2021
 Accepted: 29-07-2021

Kaushik Guha
 Associate Professor,
 Consultant Physiotherapist,
 Healing Touch Physiotherapy
 Clinic, Dum Dum Cantonment,
 Kolkata, India

Malignant otitis externa: A case report

Kaushik Guha

Abstract

The purpose of this case report is to present a case of malignant otitis externa with left side Bell's palsy, who came to my clinic for physiotherapy. He was having tenderness on the left side retroauricular area & mastoid process. The patient was also suffering from diabetes mellitus & was under medication. He was treated with galvanic stimulation for 30 sittings & demonstrated facial exercises, which he practiced in home in front of mirror. The patient also received antibiotics suggested by an E.N.T specialist.

Malignant otitis externa (MOE) is a rare fatal inflammatory disease of the external auditory canal, temporal bone, and skull base. The disease is associated with serious complications with cranial nerve involvement and high mortality and morbidity rate [1]. MOE was first reported by Toulmouche in 1838, and it was termed as "malignant" by Chandler in 1968 [2, 3]. MOE is generally caused by *Pseudomonas aeruginosa*, and it is common in elderly patients with diabetes or immunocompromised patients [4]. *Staphylococcus aureus*; *Proteus mirabilis*; and some species of fungi, such as aspergillus and *Candida species*, have also been described to cause MOE [5]. Clinical manifestations of the disease are otalgia persisting for longer than one month, chronic otorrhea, headache, and cranial nerve involvement [6]. The disease begins in the external auditory canal and then spreads to the skull base through Santorini's fissures. Additionally, the disease spreads to the stylomastoid and jugular foramina [7]. Cranial nerve involvement may occur as a result of infection progression. Facial nerve is the most common involved cranial nerve, but glossopharyngeal, vagus, accessory, or hypoglossal nerve involvements can also occur [8]. MOE is also complicated by parotitis, mastoiditis, jugular vein thrombosis, meningitis, and death [9].

Keywords: otitis externa, physiotherapy, Kaushik Guha

1. Introduction

Malignant otitis externa is an aggressive, highly morbid and rarely life threatening infection of the soft tissues of the external ear and surrounding structures, which spreads to involve the periosteum and bone of the skull base. The infection usually originates from the external auditory canal and progresses through the stages of cellulitis, chondritis, periostitis, osteitis and finally osteomyelitis. It is referred to as "skull base osteomyelitis" once the bone infection is confirmed and also known as necrotizing otitis externa due to extensive soft tissue involvement.

2. Grading

Pathological classification system has divided the disease process into 4 stages,

Stage 1: Clinical evidence of malignant otitis externa with infection of soft tissues beyond the external auditory canal, but negative Tc-99 bone scan.

Stage 2: Soft tissue infection extending beyond the external auditory canal with a positive Tc-99 bone scan.

Stage 3: As above, but with cranial nerve paralysis

Stage 3a: Single cranial nerve palsy.

Stage 3b: Multiple cranial nerve palsy.

Stage 4: Meningitis, empyema, sinus thrombosis or brain abscess [10].

3. Signs & symptoms

Patients with external otitis complain of otalgia and sensitivity to auricular movement. Otorrhea may be present, and obliteration of the external auditory canal by edema and secretions may cause hearing loss or a sensation of fullness in the ear.

Corresponding Author:
Kaushik Guha
 Associate Professor,
 Consultant Physiotherapist,
 Healing Touch Physiotherapy
 Clinic, Dum Dum Cantonment,
 Kolkata, India

Oedema with erythema of ear canal is common. However tympanic membrane is usually intact. The infection may extend to the cartilaginous skeleton of the ear canal and through Santorini's fissures to reach the temporal bone, causing osteitis. One of the hallmarks of this extension is granulation tissue in the bone-cartilage junction of the external auditory canal. This otoscopic finding is of extreme importance^[11].

Although necrotizing external otitis can occur in immune competent persons, it typically develops in persons with diabetes mellitus or another condition that compromises the immune system, such as acquired immunodeficiency syndrome, malignancy, or chemotherapy. In diabetes mellitus, poor vascular supply resulting from micro vascular disease is aggravated by *Pseudomonas* vasculitis, which further restricts tissue perfusion^[12].

As the infection spreads in the temporal bone, it may extend into the cranium and result in cranial nerve palsies. These palsies generally are caused by the secretion of neurotoxins or the compressive effect of the destructive process through the relevant foramina. Because of its anatomic location in the temporal bone, the facial nerve is usually the first nerve to become involved. Cranial nerve involvement indicates a poor prognosis. Death is usually due to intracranial complications such as sigmoid sinus thrombosis, but it also may occur because of treatment complications, including bone marrow suppression induced by long-term antibiotic therapy^[13].

4. Complications

There are few complications of OE, though they are rare.

- Necrotizing OE.
- Mastoiditis.
- Chondritis of the auricle.
- Bony erosion of the base of skull or skull based osteomyelitis.
- C.N.S infection.
- Cellulitis.

5. Physical examinations

Physical findings of OE are,

- Pain/ tenderness on palpation of the tragus or application of traction to the pinna.
- Erythema.
- Oedema.
- Narrowing of the external auditory canal.
- Conductive hearing loss.
- Purulent or serous discharge may be present.
- Cellulitis of face or neck.
- Lymphadenopathy of ipsilateral neck may be present.
- The tympanic membrane may be difficult to visualize.
- Eczema of the pinna may be present.
- Cranial nerve (CN) involvement.
- Fungal OE results in severe itching but typically causes less pain than bacterial OE does.

6. Differential Diagnoses

1. Ear canal trauma.
2. Ear canal carcinoma.
3. Otitis media with a perforation or ventilation tube present.
4. Chondritis.
5. Cranial nerve palsy.
6. Hearing loss.
7. Wisdom tooth eruption.
8. Intracranial abscess.
9. Cavernous sinus thrombosis.
10. Ramsay Hunt syndrome.
11. Furuncle^[14]

7. Investigations

Very minimal investigations are required in most of the cases. The patients with one or two episodes in a year no further action is required than treatment & cleaning the ear canal with swab. In cases where the patients complain about frequent episodes, screening for diabetes is required^[15].

8. Management

1. Anti-microbial therapy.
2. Membrane perforation.
3. Physiotherapy.

9. Prognosis

Most patients improve rapidly if the correct treatment is commenced; acute otitis externa may progress, despite proper treatment, requiring immediate ENT referral.

10. Case study

A seventy year old man was complaining of weakness of left side of his face along with pain in the left ear for last one month, while he was travelling in a neighboring country. Later he consulted medical practitioner in hospital in the city & was referred to an E.N.T specialist for consultation & to decide further course of treatment. C.T. scan of brain revealed mild age related cerebral atrophy with prominence of cortical sulci & supratentorial ventricular system & M.R.I was suggested for further evaluation. M.R.I study of brain showed left maxillary sinusitis & left mastoiditis. The E.N.T specialist also suggested for nerve conduction velocity test, which showed right sided axonal type of facial neuropathy. Clinically it was diagnosed that he was suffering from malignant otitis externa with left side Bell's palsy. Medical treatment started & he was referred for physiotherapy for the treatment of Bell's palsy. In the beginning the patient was assessed by House-Brackmann Classification of Facial Function A.K.A Facial Nerve Grading System^[16, 17]. He was in grade-VI (complete paralysis). The patient received galvanic stimulation to the left side of face. The patient was also doing mirror feedback exercises twice daily twenty times per sitting for face as home programme.



Fig 1: Before treatment - Anterior view



Fig 2: Before treatment- Lateral view

11. Result

After thirty sittings of treatment, the patient was able reach grade-II (Mild dysfunction) from grade-VI (Complete

paralysis) of House-Brackmann Classification of Facial Function/ Facial Nerve Grading System [16, 17].

Table 1: Classification of Facial Function/ Facial Nerve Grading System

Grade	Characteristics
I. Normal	Normal facial function in all areas
II. Mild dysfunction	Gross Slight weakness noticeable on close inspection May have slight synkinesis At rest, normal symmetry and tone Motion Forehead - Moderate to good function Eye - Complete closure with minimal effort Mouth - Slight asymmetry
III. Moderate dysfunction	Gross Obvious but not disfiguring difference between sides Noticeable (but not severe) synkinesis, contracture, or hemifacial spasm At rest, normal symmetry and tone Motion Forehead - Slight to moderate movement Eye - Complete closure with effort Mouth - Slightly weak with maximum effort
IV. Moderately severe dysfunction	Gross Obvious weakness and/or disfiguring asymmetry At rest, normal symmetry and tone Motion Forehead - None Eye - Incomplete closure Mouth - Asymmetrical with maximum effort
V. Severe dysfunction	Gross Only barely perceptible motion At rest, asymmetry Motion Forehead - None Eye - Incomplete closure Mouth - Slight movement
VI. Total paralysis	No movement

12. Discussion

In the above case it can be seen that Otitis externa can be cured, if it is diagnosed early & treated properly. It has a wide range of signs & symptoms, so it need to be diagnosed precisely & treated accordingly. In this case timely medical intervention along with physiotherapy helped the patient to

recover. It is suggested that physiotherapy should be started ASAP so that there is less chances of developing atrophy of muscles & fibrosis of the nerve of affected area. Along with the electrotherapy, exercises should also be prescribed & demonstrated well in presence of at least one member of the patient's family. The do's & don'ts should also be explained

in layman's term, preferably in local language. Periodic assessment or re-assessment can help the therapist to find out the efficacy of the therapy.

13. Conclusion

Otitis externa is a common external ear infection world population. It is usually seen in all age groups but in children it is slightly less common. As this condition has wide range of signs & symptoms, there is a chance of developing malignant otitis externa without early diagnosis & timely intervention, which can cost the patient's life. It can also become recurrent if proper precautions are not taken. Combination of physiotherapy along with pharmacotherapy showed good results in this case. However further researches should be done in large number of patients of different age groups can lead to better understanding of the disease as well as guide the clinicians to deal with this infection more precisely.

14. References

1. Karaman E, Yilmaz M, Ibrahimov M, Hacıyev Y, Enver O. Malignant otitis externa. *J Craniofac Surg* 2012;23:1748-51. Doi: 10.1097/SCS.0b013e31825e4d9a.
2. Bhandary S, Karki P, Sinha BK. Malignant otitis externa: A review. *Pac Health Dialog* 2002;9:64-7.
3. Chandler JR. Malignant otitis externa. *Laryngoscope* 1968;78:1257-94. Doi: 10.1288/00005537-196808000-00002.
4. Rubin J, Yu VL. Malignant external otitis: insights into pathogenesis, clinical manifestations, diagnosis, and therapy. *Am J Med* 1988;85:391-8. Doi: 10.1016/0002-9343(88)90592-X.
5. Shavit SS, Soudry E, Hamzany Y, Nageris B. Malignant external otitis: Factors predicting patient outcomes. *Am J Otolaryngol* 2016;37:425-30. Doi: 10.1016/j.amjoto.2016.04.005.
6. Lee SK, Lee SA, Seon SW, Jung JH, Lee JD, Choi JY *et al.* Analysis of prognostic factors in malignant external otitis. *Clin Exp Otorhinolaryngology* 2017;10:228-35. <https://doi.org/10.21053/ceo.2016.00612>.
7. Nadol JB. Jr Histopathology of Pseudomonas osteomyelitis of the temporal bone starting as malignant external otitis. *Am J Otolaryngol* 1980;1:359-71. Doi: 10.1016/S0196-0709(80)80016-0.
8. Mani N, Sudhoff H, Rajagopal S, Moffat D, Axon PR. Cranial nerve involvement in malignant external otitis: Implications for clinical outcome. *Laryngoscope* 2007;117:907-10. Doi: 10.1097/MLG.0b013e318039b30f.
9. Giamarellou H. Malignant otitis externa: The therapeutic evolution of a lethal infection. *J Antimicrob Chemother* 1992;30:745-51. Doi: 10.1093/jac/30.6.745.
10. A Simon Carney, Gleeson M, Browning CG, Burton M J, Clarke R *et al.* Malignant otitis externa. *Scott Brown's Otorhinolaryngology Head and Neck Surgery*, 7th Ed: Volume 3. Great Britain: Hodder Arnold 2008, 3336-3340.
11. Cristina Otilia Laza Mostafa Sarv. Malignant External Otitis-Case Report: *Global Journal of Otolaryngology* 2018, 14(3).
12. Shpitser T, Stern Y, Cohen O. Malignant External Otitis in Non diabetic patients: *Annals of Otolaryngology, Rhinology, Laryngology* 1993;102:870-872.
13. Thakar A, Kacker SK, Bahadur S. Malignant external otitis: *Indian Journal of Otolaryngology and Head and Neck surgery* 1996;48(2):114-120.
14. Ariel A, Waitzman MD. FRCSC, Chief Editor: Ravindhra G Elluru, MD, PhD: *Otitis Externa Clinical Presentation: Drugs & diseases: Medscape* 2020.
15. Ms Jessica Bewick, Mr Edward Lindisfarne, Mr Prodip Das. *Clinical Review: Acute otitis externa: GP* 2012.
16. Buck Christensen: *House-Brackmann Classification of Facial Function: Medscape* 2018.
17. Arianna Di Stadio. Another Scale for the Assessment of Facial Paralysis? *ADS Scale: Our Proposition, How to Use It: Journal of Clinical and Diagnostic Research* 2015;9(12):8-11.