

Moderately differentiated squamous cell carcinoma of the temporal bone: A case report of an external auditory canal mass in an elderly patient

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Abstract

Squamous cell carcinoma (SCC) of the temporal bone is a rare malignancy, often misdiagnosed due to its mimicry of inflammatory ear conditions. The occurrence is rare, reported at 1 to 6 per million population per year.

A 91-year-old female with diabetes, presented with one-year history of persistent right-sided otorrhoea, mixed hearing loss, and otalgia unresponsive to medical therapy. Physical examination revealed a polypoidal mass obstructing the External Auditory Canal (EAC). Contrast-enhanced CT scan identified soft tissue mass without bony erosion. Punch biopsy confirmed moderately differentiated SCC. The patient underwent modified radical mastoidectomy, followed by radiotherapy. At seven-month follow-up, imaging showed no residual tumour mass.

Surgical resection with negative margins followed by concurrent chemo-radiotherapy (CCRT) is the treatment of choice, but for tumour involving the intracerebral structures, radiotherapy is the treatment modality. This case is exceptionally rare as no previous report has described a 91-year-old patient with localised disease without bone, nodal, or cranial nerve involvement.

Keywords: Squamous Cell Carcinoma, Temporal bone, Ear neoplasm, Skull base neoplasm.

Introduction

Malignant tumours affecting the temporal bone are exceptionally rare, representing fewer than 0.2% of all the malignancies in the head and neck region.¹ It primarily occurs in individuals aged 60 or older, with a very low annual prevalence of one to six cases per million.²

There are many variants of carcinoma of temporal bone

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(Neuroendocrine carcinomas, basal cell carcinomas, and adenocarcinoma) but SCC is the most common among them, making roughly 80% of all cases.³ Cholesteatoma, otitis media, and human papillomavirus are the probable risk factors.⁴ Patients usually present with non-specific symptoms like ear pain and ear discharge which can easily be confused with other conditions like cholesteatoma, otitis externa, and mastoiditis, and the cancer mistaken for an inflammatory condition, which results in delayed diagnosis and treatment. An inflammatory condition with unexplained weight loss not responding to appropriate antibiotics arouses suspicions of malignancy, but symptoms of inflammation persisting for a long time makes the clinical picture vague.

These tumours can involve the facial nerve, parotid gland, and the brain, making treatment more difficult.⁵ Otoloscopic examination supported by radiological imaging (CT/MRI) usually provides the provisional diagnosis by identifying anatomical abnormalities. However, tissue biopsy confirms the diagnosis. For squamous cell carcinoma of the external auditory canal, the modified University of Pittsburgh staging system is widely used. Its T classification is based primarily on the local anatomical extent of the tumour, including external auditory canal bone erosion and involvement of adjacent soft tissues and critical anatomical structures, while regional nodal and distant metastatic disease are recorded separately as N and M categories.^{6,7} As the malignancy of the temporal bone is very rare, a standard treatment protocol is not well defined.⁸ However, the best approach is surgical excision with negative margins following concomitant chemotherapy and radiation.⁹ Involvement of the facial nerve serves as a poor prognostic factor.² The five-year survival rate depends on the stage of the tumour and typically ranges from 40% to 70% but decrease to 20% when the tumour is diagnosed at an advanced stage.²

The present case highlight the diagnostic importance of early biopsy in a very elderly patient with persistent inflammatory otological symptoms and an external auditory canal mass, even when CT shows no bony erosion.

Case Report

A 91-year-old female with Diabetes Mellitus presented at Khyber Teaching Hospital, Peshawar, on December 14, 2024, with a one-year history of persistent foul-smelling discharge from the right ear, conductive hearing loss (30-40db), and refractory otalgia.

The patient complained of localised pain of the affected ear (otalgia), which was not relieved with medications. The discharge was clear to greenish, purulent exudate, with a gradual reduction in the volume of discharge over the course of the illness. Significant right-sided hearing impairment ensued six months after the discharge. Systemic symptoms (fever, weight loss, or vertigo) were denied by the patient, and a history of Otorrhagia was not reported.

On examination, there was a friable, polypoidal mass obstructing the right external auditory canal (EAC) (Figure-1), which was tender on palpation with mild post-auricular swelling and no cervical lymph node involvement. Otoscopic examination revealed partial obstruction of the tympanic membrane by the lesion. Neurological examination revealed intact facial nerve function with no evidence of cranial neuropathies.



Figure-1: Endoscopic image of a pinkish polypoidal mass (blood-tinged) in the right external auditory canal, taken during mastoid exploration.

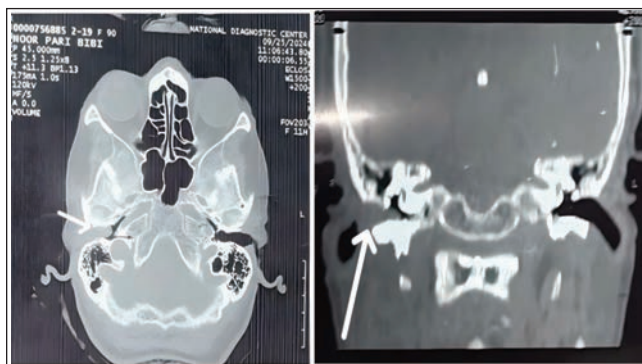


Figure-2: A. Axial view of CT scan; B. Coronal view of CT scan. Both films showing complete obstruction of the right external auditory canal by a soft tissue mass (arrow). No evidence of bony erosion is observed.

Pure tone audiometry demonstrated conductive hearing loss with a superimposed age-related sensorineural component, consistent with mixed hearing loss. Contrast-enhanced CT scan of the temporal bone demonstrated a soft tissue mass almost completely filling the right external auditory canal (Figure-2), causing inward medial displacement of the tympanic membrane in the middle ear cavity. There was no bone erosion and the structures of the middle and inner ear were unremarkable. Incidental findings were left maxillary sinusitis with left-sided Deviated Nasal Septum (DNS), high riding right jugular bulb, senile cerebral atrophy (mild dilation of extra and intra cerebral cerebrospinal fluid spaces).

Histopathological examination, following punch biopsy of the EAM lesion, revealed sheets of neoplastic squamoid cells with high nuclear-to-cytoplasmic ratios, vesicular nuclei, and prominent nucleoli, confirming moderately differentiated squamous cell carcinoma. Based on PSS, this case is staged as T1N0M0 (tumour being confined to EAC, with no lymphadenopathy and no distant metastasis).

The patient underwent a modified radical mastoidectomy to excise the tumour, with intra-operative findings confirming localised disease confined to the EAM, with involvement of the skin lining the EAM. Adjuvant radiotherapy was considered.

The patient was monitored post-operatively with follow-up visits for seven months to assess the response to treatment. During these visits, significant improvement was seen, including reduction in otalgia and no discharge from the ear. Otoscopic examination showed no evidence of residual disease. The patient tolerated the radiotherapy well without any major complications, and subsequent imaging studies showed no signs of disease progression. Also PTA showed no further deterioration in hearing, which was attributed to the successful localised tumour excision and adjuvant therapy.

This case highlights the diagnostic complexity of temporal bone malignancies, which often mimic benign inflammatory conditions such as chronic otitis externa or cholesteatoma. Despite no bony erosion visible on imaging, histopathological evaluation provides definitive diagnosis. The challenges of managing rare cancers in elderly patients with comorbidities, requires multidisciplinary approaches in such scenarios.

Written informed consent was obtained from the patient for publication of this case report and accompanying images.

Discussion

Due to the complex anatomy of the temporal bone,

malignancies may arise in unusual locations, such as the temporomandibular joint, carotid canal, or middle cranial fossae; however, such involvement typically occurs in advanced stages of the disease.⁸ Although SCC of the temporal bone is rare in itself, this case is particularly noteworthy because it occurred in a 91-year-old patient and presented as a localised external auditory canal mass without radiologic bone erosion or clinical evidence of nodal or cranial nerve spread, making it exceptionally rare, with no previously reported similar case in the literature. Cervical metastasis is commonly seen in such malignancies but no lymphadenopathy was observed in the present case. Studies reported CSOM as one of the most common risk factor for disease development.⁴ The current patient also presented with chronic ear discharge with central perforation. The initial presentation of temporal malignancies usually mimics inflammatory condition, making clinical diagnosis a bit difficult; however, the diagnosis of SCC of temporal bone was made on punch biopsy later on when the clinical suspicion was high.

Otoscopic examination aided by CT scan (mostly showing a hypo dense shadow, a mass with poorly defined margins and destructive changes in the temporal bone) and MRI (mainly showing homogenous enhancement and soft tissue changes) usually provides provisional diagnosis and helps to assess the extent of the tumour and soft tissue involvement. However, definitive diagnosis is established by histopathological examination of a biopsy specimen. PET scan is done to see distant metastasis in advanced stage. The scarcity of published data on disease management in very elderly patients underscores the need for further research, particularly given the malignancy's rarity and diagnostic complexity. PSS is widely used for staging the disease,⁸ which takes into account lymph node metastasis, CT scan findings of soft tissue, and EAC bony destruction. The current patient was staged as T1. The absence of facial nerve involvement or cervical lymphadenopathy further improved the prognosis, as involvement of facial nerve or cranial nerve infiltration is a marker of poor prognosis.

Surgery—more specifically, lateral or subtotal temporal bone resection—is the mainstay of the treatment plan but when extra temporal extension is seen, neck dissection and parotidectomy are added alongside radiotherapy.¹⁰ For localised lesions without deep invasion, a less extensive option such as Modified Radical Mastoidectomy followed by radiotherapy may suffice, as done in the current case. While treatment option for advanced stage is still a matter of debate, enough literature support the statement that combined chemo-radiotherapy is the best treatment option for T3 and T4 stage of SCC of the temporal bone.¹¹

The limitation of this case is that no MRI and PET scan was done, which could have helped the clinicians to understand the disease more comprehensively.

Conclusion

In this 91-year-old woman, persistent otorrhoea, otalgia, and hearing loss associated with an external auditory canal mass proved to be localised, moderately differentiated SCC despite the absence of bony erosion on CT. Punch biopsy established the diagnosis, and modified radical mastoidectomy followed by radiotherapy achieved clinical and radiological disease control at seven months. This case supports early tissue diagnosis when an apparently inflammatory external auditory canal lesion fails to respond to appropriate treatment.

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Author Contribution:

HDK: Drafting, review, final approval and agreement to be accountable for all aspects of the work.

IU: Data acquisition, critical review, final approval and agreement to be accountable for all aspects of the work.

NU: Design, critical review, concept, final approval and agreement to be accountable for all aspects of the work.

MIM: Supervision, final approval and agreement to be accountable for all aspects of the work.