

**Case Report****Squamous cell carcinoma of the external auditory canal  
with intracranial invasion****Trining Dyah, Sutji Pratiwi**Department of Otorhinolaryngology Head and Neck Surgery, Faculty of Medicine,  
Universitas Hasanuddin, Makassar, Indonesia**ABSTRACT**

**Background:** Squamous cell carcinoma (SCC) of the external auditory canal (EAC) is a rare and aggressive malignancy that may resemble chronic ear disease, causing delayed diagnosis and poor prognosis in advanced stages. **Purpose:** To report a case of SCC of the EAC with temporal bone and intracranial invasion. **Case report:** A 64-year-old male with chronic otorrhoea and previous mastoidectomy, presented with retroauricular ulcerative mass. Clinical examination found multiple ulcerative masses in the left retroauricular region. MRI showed temporal bone destruction with intracranial extension, and histopathology confirmed well-differentiated SCC, classified as stage IVA (T4N0M0). The patient underwent radical surgical excision, followed by adjuvant chemotherapy and radiotherapy; however, local recurrence occurred within six months. **Clinical question:** In advanced SCC of the EAC, how does multimodal therapy affect local control and outcomes? **Method:** A narrative evidence search was conducted through PubMed, Scopus, and Google Scholar for studies from 2016 to 2026 on SCC of the EAC, temporal bone invasion, intracranial extension, surgery, radiotherapy, chemoradiation, and multimodal therapy. **Result:** Evidences supported MRI for assessing tumor extension and guiding treatment. T4 disease with intracranial invasion remains associated with poor local control despite multimodal therapy. **Conclusion:** SCC of the EAC should be suspected in chronic otorrhea, non-healing ear lesions, or persistent symptoms after ear surgery. Early recognition, MRI-based staging, and multidisciplinary treatment are essential, although recurrence risk remains high in advanced T4 disease.

**Keywords:** squamous cell carcinoma, external auditory canal, intracranial invasion, temporal bone, multimodal therapy

**ABSTRAK**

**Latar belakang:** Karsinoma sel skuamosa atau squamous cell carcinoma (SCC) pada liang telinga luar (external auditory canal, atau EAC) merupakan keganasan langka yang bersifat agresif. Penyakit ini sering menyerupai radang telinga kronik, sehingga berisiko menyebabkan keterlambatan diagnosis, dan prognosis buruk pada stadium lanjut. **Tujuan:** Melaporkan kasus SCC pada EAC, dengan invasi ke tulang temporal dan intrakranial. **Laporan kasus:** Seorang laki-laki berusia 64 tahun dengan riwayat otore kronis dan mastoidektomi sebelumnya, datang dengan massa ulseratif multipel retroaurikuler kiri. MRI memperlihatkan destruksi tulang temporal disertai ekstensi intrakranial, serta pemeriksaan histopatologi mengonfirmasi SCC berdiferensiasi baik yang diklasifikasikan sebagai stadium IVA (T4N0M0). Pasien telah menjalani eksisi bedah radikal yang dilanjutkan dengan kemoterapi dan radioterapi adjuvan; namun, rekurensi lokal terjadi dalam enam bulan. **Pertanyaan klinis:** Pada kasus SCC di EAC stadium lanjut, bagaimana terapi multimodal mempengaruhi kontrol lokal dan luaran klinis? **Metode:** Penelusuran bukti dilakukan melalui PubMed, Scopus, dan Google Scholar terhadap literatur relevan yang dipublikasikan dari tahun 2000 hingga 2026, menggunakan kata kunci: squamous cell carcinoma, external auditory canal, tulang temporal, invasi intrakranial, pembedahan, radioterapi, kemoradiasi, dan terapi multimodal. **Hasil:** Bukti mendukung penggunaan MRI untuk menilai perluasan tumor dan memandu perencanaan terapi. Penyakit stadium T4 dengan invasi intrakranial tetap mungkin terjadi, meskipun telah diberikan terapi multimodal. **Kesimpulan:**

*SCC pada EAC perlu dicurigai pada pasien dengan otore kronik, lesi telinga yang tidak sembuh, atau gejala menetap setelah operasi telinga. Deteksi dini, penetapan stadium berbasis MRI, dan tatalaksana multidisiplin sangat penting, meskipun risiko rekurensi tetap tinggi pada penyakit stadium T4 lanjut.*

**Kata kunci:** karsinoma sel skuamosa; meatus akustikus eksternus; invasi intrakranial; tulang temporal; terapi multimodal

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## INTRODUCTION

Squamous cell carcinoma (SCC) of the external auditory canal (EAC) is an extremely rare head and neck malignancy, accounting for only 0.2% of all cases, with an incidence of 1–6 per million annually, predominantly affecting males aged 60–70.<sup>1,2</sup> Anatomically, the temporal bone facilitates tumour spread through osseous canals, vasculature, and foramina.<sup>3,4</sup> Approximately 80% of lesions are SCC, with the remainder being basal cell carcinoma, adenocarcinoma, or adenoid cystic carcinoma.<sup>3,5</sup> Risk factors include chronic suppurative otitis media (CSOM), UV exposure, prior radiotherapy, and oncogenic HPV infection.<sup>6</sup>

Delayed diagnosis is common due to nonspecific symptoms resembling chronic ear infections.<sup>7</sup> Histopathological analysis typically reveals polygonal epithelial cells with eosinophilic cytoplasm and intercellular bridges; immunohistochemistry for CK5/6 and 34βE12 supports squamous differentiation.<sup>8</sup> High-resolution CT and MRI are essential in assessing bone erosion, soft tissue involvement, and facial nerve extension, which are crucial for treatment planning.<sup>9</sup>

Treatment involves surgery, radiotherapy, and multimodal chemotherapy depending on the tumour's stage and site.<sup>5,10</sup> Lateral temporal bone resection (LTBR) is recommended for T1–T2 tumours, while subtotal or total resections are needed for advanced stages.<sup>11,12</sup> En bloc resection offers pathological

advantages, but piecemeal resection remains an option in selected cases.<sup>13</sup> Involvement of the parotid gland and cervical nodes may require parotidectomy and selective neck dissection.<sup>14,15</sup> Postoperative radiation therapy is recommended to improve local control, particularly in cases with positive margins and perineural invasion.<sup>16–17</sup> Postoperative radiotherapy is recommended to improve local control, especially in cases with positive margins and perineural invasion.<sup>18</sup> Cisplatin and 5-FU-based chemotherapy are applied in advanced or metastatic cases. However, recurrence rates remain high, particularly in T3–T4 tumours.<sup>19</sup>

## CASE REPORT

A 64-year-old male was referred to the otology clinic of a tertiary referral hospital with complaints of a progressive lump that appeared behind the left ear, two weeks after undergoing a canal wall down mastoidectomy procedure. The patient has a history of chronic suppurative otitis media (CSOM) for over two decades, which has not been optimally treated, accompanied by symptoms of hearing loss, recurrent ear discharge, tinnitus, and longstanding facial symptoms on the left side. The mastoidectomy surgery was previously performed as an attempt to manage CSOM with complications of cholesteatoma, which had caused local destruction of the mastoid bone.

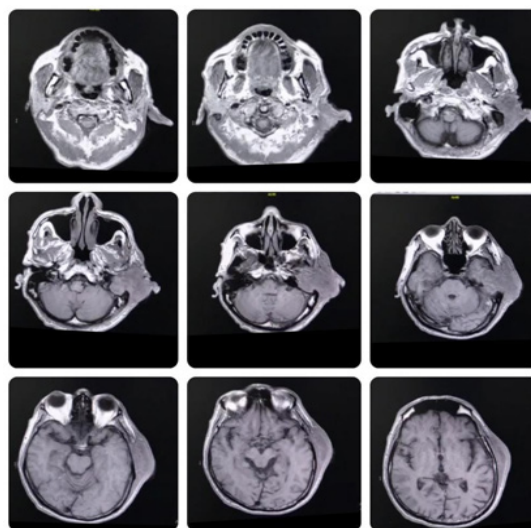
Upon clinical evaluation, multiple ulcerative masses were observed in the

left retroauricular region, approximately 8×7×5 cm in size, with an uneven surface, mucopurulent exudate, and easy bleeding. The mass appeared to penetrate the skin and subcutaneous tissue structures, and showed signs of active proliferation. The post-operative wound appeared open with inadequate healing signs of the left external auditory canal due to neoplastic tissue growth. No enlarged lymph nodes were found upon palpation. Neurological examination revealed a House-Brackmann grade II facial nerve palsy, indicating mild but functional impairment of the left facial expression.

Supporting examinations were carried out to assess the extent of the lesion, and potential involvement of intracranial structures. Figure 1 displayed clinical documentation of the multiple ulcerative retroauricular masses extensively involving soft tissue. MRI of the head with contrast showed an isointense lesion on T1WI and hyperintense on T2WI, which destructively extended into the mastoid cells, tympanic cavity, and external auditory canal. Additionally, there was involvement of the temporal bone with invasion toward the duramater in the posterior fossa, indicating involvement of intracranial structures (Figure 2). No cerebral edema or secondary masses were found in the cerebrum or brainstem.



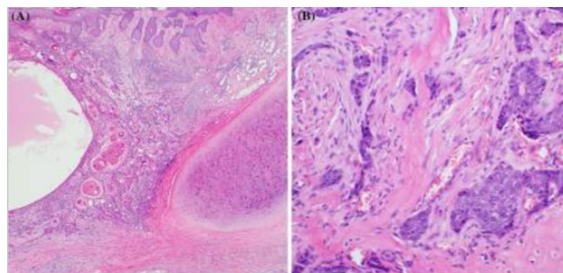
**Figure 1. Clinical documentation showing multiple lobulated ulcerative masses in the left retroauricular region. The lesion appeared exudative, bleeds easily, and demonstrated infiltrative growth into surrounding tissue.**



**Figure 2. Axial MRI slice of the head showing a destructive lesion in the left temporal bone with extension into the posterior fossa and dural infiltration.**

The incisional biopsy taken from the retroauricular lesion revealed atypical squamous epithelial proliferation with good differentiation, nuclear pleomorphism, and stromal tissue invasion, consistent with a diagnosis of well-differentiated squamous cell carcinoma (Figure 3). Metastatic staging examinations were conducted using chest radiography, abdominal ultrasound, and bone

survey, all of which showed no evidence of distant organ spread. Considering the local involvement and the absence of regional or distant metastasis, this case was classified as stage IVA (T4N0M0) according to the latest edition of the AJCC TNM staging system. A summary of the patient's clinical data prior to therapy is presented in Table 1.



**Figure 3. Haematoxylin and eosin-stained histopathology of malignancy involving the EAC: (a) moderately differentiated squamous cell carcinoma and (b) poorly differentiated squamous cell carcinoma.**

**Table 1. Summary of patient clinical data**

Clinical parameters	Findings
Age	64 years
Symptoms	Retroauricular mass, chronic otorrhoea, paresis
Physical Examination	Ulcerative mass, exudate, moist surgical wound
MRI	Invasion of temporal bone, tympanic cavity, dura mater
Histopathology	Well-differentiated squamous cell carcinoma
Stage	IVA (T4N0M0)
Therapy	Tumour excision, chemotherapy, radiotherapy
Follow-up	Local recurrence at 6 months

The patient subsequently underwent radical excision of the tumour tissue, including debridement of necrotic tissue around the mastoid and retroauricular area. Following the surgical procedure, the patient was referred for combination chemotherapy using paclitaxel, cisplatin, and 5-fluorouracil over eight cycles, followed by 35 sessions of external fractionated radiotherapy. During the course of therapy, the patient exhibited good tolerance to the drugs, with no severe nausea, neutropenia, or significant haematological complications.

However, at the six-month evaluation following the completion of therapy, the patient reported a new mass in the previous surgical area, showing rapid growth and ulceration. Clinical and radiological evaluation strongly suggested local recurrence. Given the patient's general condition and the outcomes of previous treatment, a decision was made to initiate second-line chemotherapy with a palliative regimen. No severe side effects were reported during the subsequent therapy, although the patient experienced mild weight loss and fatigue. Psychosocial interventions and regular clinical monitoring continued to be implemented to support the patient's overall quality of life.

## CLINICAL QUESTION

P (Problem): Squamous cell carcinoma of the EAC with intracranial invasion.

I (Intervention): Multimodal approach (radical excision, chemotherapy, and radiotherapy)

C (Comparison): Single modality therapy (e.g., surgery alone or radiotherapy alone)

O (Outcome): Local disease control and recurrence

## METHOD

This case report presented a case of a 64-year-old man with chronic otorrhoea,

previous mastoidectomy, and a progressive retroauricular ulcerative mass. The clinical question was formulated using the PICO framework. Evidence was searched through PubMed, Scopus, and Google Scholar for relevant literature published from 2016 to 2026 using keywords related to squamous cell carcinoma, external auditory canal, temporal bone, intracranial invasion, surgery, radiotherapy, chemoradiation, and multimodal treatment. Case reports, retrospective studies, systematic reviews, and clinical guidelines were narratively reviewed according to their relevance to diagnosis, disease extension, therapeutic approach, local control, and recurrence risk in SCC of the EAC with intracranial invasion.

## RESULT

Squamous cell carcinoma (SCC) of the EAC is a very rare but potentially aggressive malignancy, particularly when it has infiltrated the temporal bone and intracranial structures.<sup>4-6</sup> The diagnosis established in this patient demonstrated clinical strength based on a combination of characteristic symptoms of chronic otorrhoea, facial nerve paresis, and a retroauricular mass, supported by MRI imaging which revealed bony destruction and involvement of the tympanic cavity up to the dura mater.

Histopathological confirmation as well-differentiated SCC reinforces diagnostic accuracy, as described by the histological characteristics of SCC involving polygonal cells with eosinophilic cytoplasm and nuclear pleomorphism.

Success in this case was marked by a multidisciplinary approach combining tumour excision, cisplatin-paclitaxel-5FU-based chemotherapy, and fractionated radiotherapy. Nevertheless, the emergence of local recurrence at the sixth month underscores the limitations of the strategy when faced with extensive bony invasion.

McRackan<sup>20</sup> reported that despite the use of multimodal therapy, the rate of local recurrence in T4 temporal bone SCC cases, remained notably high. The surgical choice of piecemeal resection, as performed in this case, often fails to ensure completely negative margins if invasion has reached the dura or intracranial space.<sup>21</sup>

The literatures indicated that no standardized treatment guidelines exist for SCC of the external auditory canal (EAC) due to its rarity. The Pittsburgh staging system, which is more commonly used than the TNM system, does not always reflect the biological aggressiveness of the tumour.<sup>22</sup> Wierzbicka<sup>23</sup> emphasized that the en bloc lateral temporal bone resection approach was more effective in achieving negative margins, but had limitations in cases with invasion of vital structures. Postoperative radiotherapy remains a mainstay in advanced-stage cases, although its optimal effectiveness remains debatable. Further studies by Takenaka and Kitani<sup>24</sup> suggested that cisplatin and 5-FU-based chemoradiotherapy could be an effective alternative, particularly in tumours with unclear resection margins or postoperative residue. Moreover, recurrence remains high even after technically achieving tumour-free margins, as seen in Zanoletti's research.<sup>17</sup> Therefore, subsequent management planning must be individualised, taking into account the biological characteristics of the tumour and the risk of local recurrence.

## DISCUSSION

Squamous cell carcinoma (SCC) of the external auditory canal (EAC) is a rare malignancy with aggressive local behaviour.<sup>26</sup> In this case, the diagnosis was challenging because the patient had a long history of chronic suppurative otitis media, recurrent otorrhoea, hearing loss, and a non-healing postoperative wound. These symptoms may resemble chronic inflammatory ear disease,

leading to delayed recognition of malignancy. Therefore, persistent otorrhoea, bleeding granulation tissue, facial nerve weakness, or poor wound healing after ear surgery should raise suspicion of SCC of the EAC and prompt early biopsy and imaging evaluation.<sup>27</sup>

The rapid local recurrence within six months was most likely related to the advanced stage of the disease at diagnosis. MRI showed tumour extension to the mastoid cells, tympanic cavity, temporal bone, and dura mater, corresponding to T4 disease. In this stage, complete tumour clearance is difficult because the lesion may involve vital structures such as the dura, facial nerve canal, and posterior fossa. Although radical excision was performed, microscopic residual tumour could not be completely excluded. This explains why local recurrence may still occur despite multimodal treatment.<sup>28</sup>

Surgical margin control remains a major problem in advanced SCC of the EAC. En bloc temporal bone resection is preferred when feasible, but this approach becomes limited when the tumour has reached intracranial structures.<sup>29</sup> Previous studies had shown that advanced temporal bone SCC has a high recurrence rate, especially in T3–T4 disease and in cases with incomplete or uncertain surgical margins.<sup>30</sup> The recurrence in this patient was therefore consistent with the aggressive behaviour reported in advanced SCC of the EAC.

The combination of paclitaxel, cisplatin, and 5-fluorouracil was selected because the patient had locally advanced disease with a high risk of residual tumour after surgery. Cisplatin and 5-fluorouracil are commonly used in advanced head and neck SCC due to their cytotoxic and radiosensitising effects, while paclitaxel may provide additional antitumour activity. In this case, chemotherapy and radiotherapy were used as part of a multimodal approach to improve local control, although the prognosis of T4 SCC of the EAC remained poor.

Imaging has an important role in determining tumour extension and treatment planning. High-resolution CT is useful for evaluating bone erosion, while MRI is superior for assessing soft tissue involvement, dural invasion, and intracranial extension. Similar to previous reports, this case showed that delayed diagnosis and advanced local invasion are closely associated with recurrence and poor prognosis. Therefore, early clinical suspicion, adequate imaging, biopsy of suspicious lesions, and multidisciplinary management are essential in improving disease control in SCC of the EAC.

In conclusion, squamous cell carcinoma (SCC) of the external auditory canal (EAC) is a rare but aggressive malignancy that may be easily misdiagnosed as chronic suppurative otitis media because of similar clinical manifestations, such as chronic otorrhoea, hearing loss, and non-healing ear lesions. MRI plays an important role in evaluating tumour extension, particularly temporal bone destruction, dural involvement, and intracranial invasion. This case showed that advanced SCC of the EAC had a high risk of early local recurrence despite multimodal therapy, especially when the tumour has reached T4 stage. Early suspicion, timely biopsy, adequate imaging, and multidisciplinary management are therefore essential to improve local disease control.

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