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Treatment of squamous cell carcinoma of external auditory canal: A tertiary cancer centre experience

Ajeet Kumar Gandhi [a,*], Soumyajit Roy [a], Ahitagni Biswas [a], Mohd Waseem Raza [a], Tripti Saxena [a], Suman Bhasker [a], Atul Sharma [b], Alok Thakar [c], Bidhu Kalyan Mohanti [a]

[a] Department of Radiation Oncology, Dr. B. R. Ambedkar Institute Rotary Cancer Hospital, All India Institute of Medical Sciences, New Delhi 110029, India
[b] Department of Medical Oncology, Dr. B. R. Ambedkar Institute Rotary Cancer Hospital, All India Institute of Medical Sciences, New Delhi 110029, India
[c] Department of Oto-rhino-laryngology and Head and Neck Surgery, All India Institute of Medical Sciences, New Delhi 110029, India

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ABSTRACT

Objective: Carcinoma of external auditory canal (EAC) is a rare disease with variable management strategies and prognosis. We aimed to analyze treatment modalities, prognostic factors and survival outcomes in patients of squamous cell carcinoma of EAC treated at our institution.
Methods: Forty-three patients of squamous cell carcinoma of EAC were analyzed for clinical presentation, stage, surgical procedures and radiotherapy (RT) modalities employed. Stell and McCormick staging system was used for staging of the patients. Progression free survival (PFS) was estimated by the use of Kaplan–Meier product-limit method. Log rank test was used to assess the impact of prognostic variables on PFS. Multivariate analysis was performed using the Cox hazard regression model. p value of <0.05 was considered significant for all statistical analysis.
Results: Median age was 56 years (range: 12–84 years). Male to female ratio was 31:12. Stage was T1, T2 and T3 in 2, 17 and 18 patients respectively. Sixteen patients underwent surgery. Thirty-six patients received RT (14 received definitive RT, 11 had post-operative RT and 11 had RT with palliative intent). Eight patients (16%) received chemotherapy (5 received concurrent with RT, 2 had adjuvant and 1 had neo-adjuvant chemotherapy). Nine patients (of 11 patients) achieved a complete response (CR) and 2 achieved a partial response (PR) after surgery plus post-operative RT. Nine patients and 5 patients respectively achieved CR and PR after definitive RT (with or without concurrent chemotherapy). Of the 11 patients who received palliative RT, 2 had very good objective response (>50%) and 7 patients had PR to palliative RT. After a median follow-up of 16 months, median PFS for the entire cohort was 14 months. Two-year PFS rates were 85.7%, 46.9% and 0% for patients treated with surgery and post-operative RT, definitive RT and palliative RT respectively. On univariate analysis, higher stage ($p = 0.05$) and facial nerve palsy at presentation ($p = 0.0008$) were significant predictors of inferior PFS.
Conclusion: Patients with carcinoma of EAC present mostly in advanced stage at our centre. Combined higher stage (T3) and facial nerve palsy at presentation portend poorer outcome. Combined modality treatment with surgery and radiotherapy should be advocated and palliative RT remains a reasonable treatment option in patients with advanced incurable disease.

1. Introduction

Carcinoma of EAC (external auditory canal) is an extremely rare disease entity accounting as a cause of 1 in 5000–15,000 ear complaints [1]. It consists of less than 2% of head and neck cancers and has an annual incidence of around 1 per million populations [2,3]. These tumours usually present in the 5th–7th decade of life [4,5] with a slight male preponderance. Otorrhea [50–90%] has been reported as the most common presenting symptom in various series followed by pain, hearing loss and mass in ear canal [6]. Facial nerve palsy at presentation has been reported variably in different series in 16–50% of patients [7]. Squamous cell carcinoma (SCC) comprises more than 80% of cases while adenoid cystic carcinoma (ACC) is seen in 6–10% of cases [6]. Due to rarity, the available literature does not provide a complete understanding of this disease entity. There is also conflicting and limited information available on clinical staging of this malignancy leading to discrepancy in staging and management

* Corresponding author at: Department of Radiation Oncology, 1st Floor, Dr. B. R. Ambedkar Institute Rotary Cancer Hospital, All India Institute of Medical Sciences, New Delhi 110029, India. Tel.: +91 9013277915/9560703223; fax: +91 11 26589821.
E-mail address: ajeetgandhi23@gmail.com (A.K. Gandhi).

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of this tumour in different series [1,8]. The staging system described by Stell and McCormick [9] in 1985 was the most prevalent system in available literature but has now been largely superseded by the Pittsburgh staging system [10]. The latter combines the histopathological and radiological findings, leading to a more comprehensive staging of these tumours. The management of these tumours was initially described by Politzer in 1883 [11]. Since then, the management has evolved from piecemeal temporal bone resection to en bloc temporal bone resection and further to combined modality treatment of surgery and post-operative radiotherapy [12]. Surgery or radiotherapy alone is usually used for T1 lesion. Advanced T stage and positive microscopic margins are important factors in determining the necessity for post-operative radiation therapy for these malignancies [13]. A number of factors other than the tumours stage e.g. poorly differentiated tumours [14], lymph node involvement, and facial nerve palsy [15] have been noted to confer poor prognosis. The current study is aimed at analyzing the treatment modalities, prognostic factors and survival outcomes in patients of carcinoma of external auditory canal (EAC) treated at our institution.

2. Materials and methods

Medical records of patients with malignant tumours of external auditory canal treated at our institution from 2001 to 2012 were retrieved from the departmental archives. A total of 52 previously untreated patients with confirmed histopathology were identified. Forty-three patients with squamous cell carcinoma EAC were included in this retrospective review, excluding 4 patients of adenoid cystic carcinoma of EAC, 5 patients with other histologies (1 each with aggressive papillary tumour, rhabdomyosarcoma, sarcomatoid tumours and 2 with apocrine adenocarcinoma). This study was approved by the Institutional ethics board. Patients were evaluated at the multidisciplinary head and neck clinic jointly by radiation oncologists, oto-rhino-laryngologists and medical oncologists. Pre-treatment workup included detailed oto-rhino-laryngological examination, complete blood counts and blood chemistry profile, chest X-ray/computed tomography (CT) scan of chest and a contrast enhanced CT scan or magnetic resonance imaging (MRI) of the head and neck. We staged the patients based on their clinical, radiological and pathological findings using staging system described by Stell and McCormick [9]. In general, the treatment approach followed was: (1) surgery for resectable tumour followed by post-operative radiotherapy (PORT) depending on presence of high-risk histopathological features (positive or close margin i.e. <5 mm, node positive disease, peri-nodal spread, peri-neural invasion, residual disease after surgery); (2) definitive radiotherapy with or without chemotherapy for patients deemed inoperable because of disease extent, medical co-morbidities or patient preferences; (3) palliative radiotherapy for patients with extensive local or nodal disease not suitable for curative treatment or those with poor performance status. Surgical treatment included: (1) lateral temporal bone resection (LTBR): en bloc removal of EAC, tympanic membrane, concha and complete mastoidectomy with or without parotidectomy/neck dissection using an extended facial recess approach; (2) subtotal temporal bone resection: LTBR with dissection of otic capsule, medial wall of middle ear and mastoid; (3) radical or modified radical mastoidectomy. Chemotherapy (concurrent, adjuvant or neo-adjuvant) was used in some patients and not routinely used. The details of chemotherapy regimen used are provided in Section 4.

3. Response assessment and statistical analysis

Clinical and radiological response assessment with contrast enhanced CT scan or MRI of head and neck was done using WHO response assessment criteria at 3 months and subsequently every 6 months after completion of treatment. For the present study, we have reported the overall response rate at 6th month of follow-up visit. Progression free survival (PFS) was defined as the time interval from the date of start of treatment to the date of clinical or radiological disease progression. Overall survival (OS) was defined as the time interval from the date of start of treatment to the date of death from any cause. PFS and OS were estimated by the use of Kaplan–Meier product-limit method. Log rank test was used to assess the impact of prognostic variables on PFS. Multivariate analysis was performed using the Cox hazard regression model. p value of <0.05 was considered significant for all statistical analysis. Statistical analysis was performed with the SPSS software package (version 16.0; SPSS, Chicago, IL)

4. Results

Median age at presentation was noted to be 56 years (range: 12–84 years). Male to female ratio was 31:12. Table 1 summarizes the characteristics of patients at the time of presentation. Median Karnofsky performance status (KPS) of the patients was noted to be 70 (range: 50–90). Computed tomography scan of head and neck was performed in 39 patients and magnetic resonance imaging was done in only 4 patients. High-resolution CT scan (HRCT) with bone algorithm was done in 20 patients.

Six patients (14%) had intracranial disease extension, 2 patients had involvement of temporo-mandibular joint and 3 patients had parotid involvement at presentation. Four patients had vertigo and 2 presented with tinnitus. Fourteen patients (32.5%) presented with radiologically visible or clinically palpable cervical lymphadenopathy. Level II and pre-auricular group were involved in 7 and 3 patients respectively; 1 patient each had enlarged nodes in level IB and IV and 2 patients had ipsilateral cervical lymphadenopathy involving multiple levels.

Sixteen patients underwent surgery. Surgical techniques employed were subtotal temporal bone resection ($n = 04$), lateral temporal bone resection ($n = 02$), radical mastoidectomy ($n = 9$) and modified radical mastoidectomy ($n = 01$). Lymph node dissection

Table 1
Characteristics of patients at the time of presentation.

Characteristics	Patient number [total $n = 50$]
Clinical presentation[a]	
Ear discharge	37
Median duration of discharge (months) [range]	12 (1–240)
Ear discharge since childhood	12
Facial nerve palsy	14
Ear pain	19
Median duration of pain (months) [range]	6 (1–60)
Hearing loss	22
Median duration of hearing loss (months) [range]	9 (2–240)
Growth in the EAC	18
Histology	
Squamous cell carcinoma	43
WDSCC	11
MDSCC	12
PDSCC	01
Grade not specified	19
Stage (Stell and McCormick) [10]	
T1	02
T2	17
T3	18
Unknown	06

EAC: external auditory canal; WDSCC: well differentiated squamous cell carcinoma; MDSCC: moderately differentiated squamous cell carcinoma; PDSCC: poorly differentiated squamous cell carcinoma.
[a] Total number of symptoms may add to more than 43 because of multiple symptoms in a patient.

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