Section: Miscellaneous

Original Research Article

HISTOPATHOLOGICAL SPECTRUM OF BENIGN AND MALIGNANT TUMORS OF THE EXTERNAL AUDITORY CANAL: A FIVE-YEAR RETROSPECTIVE STUDY AT A TERTIARY CARE CENTER

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Received *: 09/03/2025*
Received in revised form *: 01/05/2025*
Accepted *: 16/05/2025*

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DOI: 10.70034/ijmedph.2025.2.297

Source of Support: Nil,
Conflict of Interest: None declared

Int J Med Pub Health
2025; 15 (2); 1656-1661

ABSTRACT

Background: Tumors of the external auditory canal (EAC) are rare and exhibit a broad histopathological range, from benign neoplasms to aggressive malignancies. Given their rarity and nonspecific clinical presentations, these tumors often pose significant diagnostic challenges. Histopathological evaluation is pivotal in confirming diagnoses and determining appropriate management strategies. This study aims to evaluate the incidence and histopathological spectrum of benign and malignant tumors of the external auditory canal at a tertiary care center over a five-year period.

Materials and Methods: A retrospective analysis was conducted at the Department of Pathology, Government ENT Hospital, Koti, covering the period from July 2014 to June 2019. Neoplastic lesions of the EAC were included, while inflammatory and infectious lesions were excluded. Clinical data were gathered, and histopathological slides were reviewed to classify lesions as either benign or malignant.

Results: Out of 119 EAC biopsies and excision specimens received, 45 cases (37.8%) were identified as neoplastic. Of these, 18 cases were benign, with common types including papillomas and osteomas. Malignant tumors comprised 27 cases, with squamous cell carcinoma (SCC) being the most prevalent, followed by adenoid cystic carcinoma (ACC) and basal cell carcinoma (BCC). The majority of malignant cases presented with symptoms such as otalgia and persistent otorrhea.

Conclusion: Although EAC tumors are uncommon, they exhibit a diverse histopathological spectrum. Early detection and histopathological diagnosis are critical for guiding treatment, especially for malignant lesions, where timely intervention plays a significant role in improving prognosis.

Keywords: EAC, benign tumors, malignant tumors, osteoma, squamous cell carcinoma.

INTRODUCTION

The external auditory canal (EAC) is a short, curved structure essential for sound transmission. Despite its small size, it can accommodate a range of lesions, from benign neoplasms to aggressive malignancies. These tumors are relatively uncommon and often present with nonspecific symptoms such as otalgia, otorrhea, hearing loss, or a palpable mass. These symptoms may resemble infections or chronic inflammatory conditions, often leading to delayed diagnosis.[1,2]

Benign EAC tumors include ceruminomas, papillomas, osteomas, and sebaceous adenomas, typically slow-growing and asymptomatic. In contrast, malignant tumors, especially squamous cell carcinoma (SCC), are more invasive and associated with poor prognosis, often due to late-stage diagnosis and limited clinical awareness.[3,4] Tumors of the EAC and temporal bone account for less than 0.2% of all head and neck malignancies,[5] with an

estimated annual incidence of primary malignant EAC tumors being only about 1 per 1 million people, making them exceptionally rare.[6]

Because of their rarity, comprehensive data on the histopathological spectrum of EAC tumors is limited. Most studies consist of small case series, with few offering a detailed classification of both benign and malignant lesions. Histopathological evaluation remains the gold standard for diagnosis, directing treatment decisions and influencing prognostic outcomes. Early and precise diagnosis is particularly crucial in malignant cases, where the stage at diagnosis and the adequacy of surgical margins are key factors influencing prognosis.[7]

This study aims to assess the incidence and histopathological spectrum of both benign and malignant tumors of the external auditory canal at a tertiary care ENT hospital over a five-year period. By investigating the clinicopathological characteristics of these rare tumors, the study aims to provide deeper insights into their distribution and the associated diagnostic challenges, ultimately contributing to more effective clinical management.

MATERIALS AND METHODS

Study Design: This was a retrospective descriptive study conducted at the Government ENT Hospital, Koti, spanning a five-year period from July 2014 to June 2019.

Study Setting: The study was performed at the Department of Pathology at the Government ENT Hospital, Koti, a tertiary care institution specializing in otolaryngology services.

Inclusion Criteria:

The study included all cases diagnosed with neoplastic lesions (both benign and malignant) of the external auditory canal.

Exclusion Criteria:

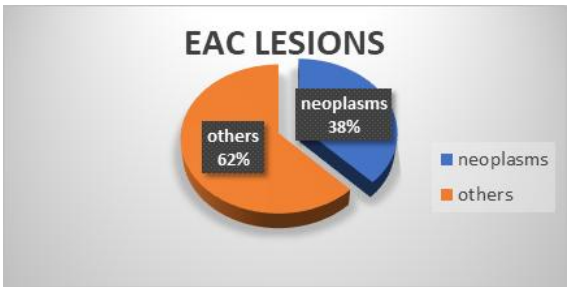
Inflammatory and infective lesions of the external auditory canal were excluded to focus exclusively on neoplastic lesions.

Data Collection: Patient records were systematically reviewed for clinical history, demographic details, and histopathological findings. Only cases with a confirmed histopathological diagnosis of external auditory canal lesions were included in the study.

Histopathological Examination: Tissue samples obtained through surgical procedures such as biopsies or excisions were processed and stained with standard hematoxylin and eosin (H&E). Histopathological slides were independently reviewed by two pathologists to ensure accurate diagnosis. Lesions were categorized as benign or malignant based on their distinct histological features.

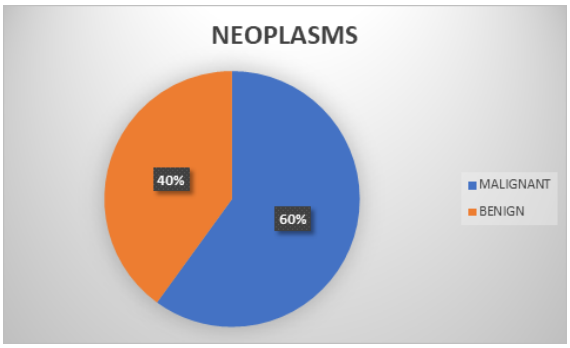
RESULTS

In the present study, a total of 119 biopsies and excised specimens from the external auditory canal were received, of which 45 cases were neoplastic.



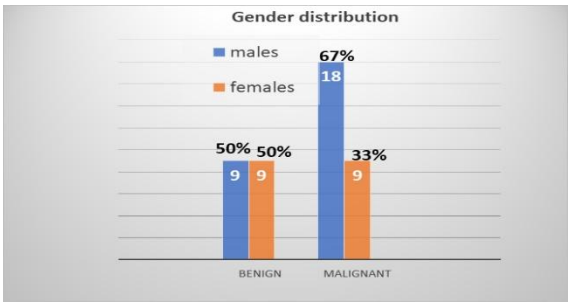
Graph 1: Distribution of EAC lesions

In our study of 45 cases, 27 (60%) were malignant, while 18 (40%) were benign.



Graph 2: Distribution of EAC Neoplasms

The male-to-female ratio in the present study is 1.5:1. Among males, there were 27 cases, with 18 being benign and 9 malignant. In females, there were a total of 18 cases, equally divided between 9 benign and 9 malignant cases.



Graph 3: Gender Distribution

Age distribution

In the present study, the age range spans from 4 to 75 years, with the majority of cases—17 in total—falling within the 51-60 year age group.

Table 1: Age distribution of cases

Age	No. of cases(%)
0-10	2(4.4)
11.-20	4(8.8)
21-30	7(13)
31-40	5(11.1)

41-50	4(8.8)
51-60	17(37.8)
61-70	4(8.8)
71-80	2(4.4)
>80	0(0)

Table 2: Benign tumors spectrum and distribution

Benign tumor	No. of cases
Capillary hemangioma	5
Osteoid osteoma	5
Squamous papilloma	3
Schwanoma	2
Spidraadenoma	1
Glomus tumour	1
Nevus	1

Among the 18 benign cases, there were 5 cases of capillary hemangioma, 5 cases of osteoid osteoma, 3 cases of squamous papilloma, 2 cases of schwannoma, and 1 case each of spiradenoma, glomus tumor, and nevus.

Table 3: Spectrum and distribution of malignant cases

MALIGANT	No. of cases
SQUAMOUS CELL CARCINOMA	22
BASAL CELL CARCINOMA	1
ADENOID CYSTIC CARCINOMA	2
ADENOCARCINOMA	1
SRCT	1

Out of 27 cases of malignant tumors, squamous cell carcinoma was the most common, accounting for 22 cases. Additionally, there were 2 cases of adenoid cystic carcinoma, and 1 case each of basal cell carcinoma, adenocarcinoma, and small round cell tumor.

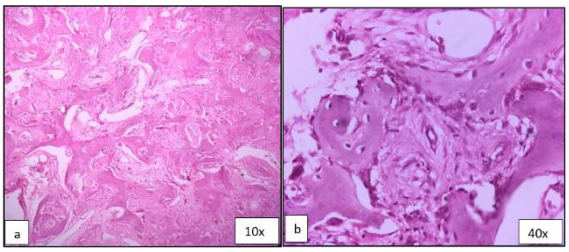


Figure a & b: Osteoid osteoma haphazard bony trabeculae with osteoblastic rimming

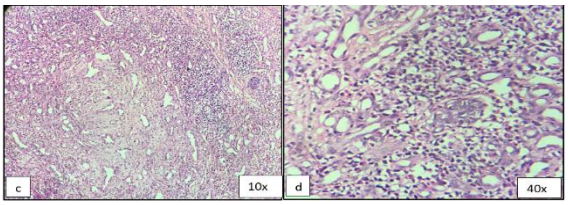


Figure c & d: Capillary hemangioma showing lobules of capillary sized vessels lined by endothelial cells

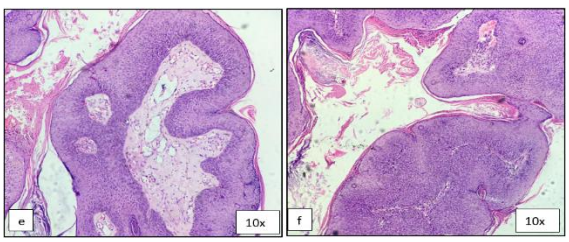


Figure e & f: Squamous papilloma showing fibrovascular cores lined by benign stratified squamous epithelium

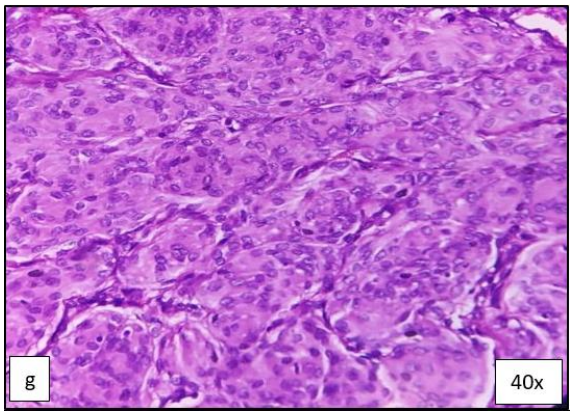


Figure g: Glomus tumor – tumor cells are small uniform with centrally located nucleus

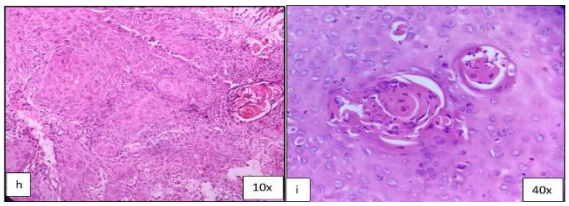


Figure h & I: Squamous cell carcinoma showing keratin pearls and pleomorphic squamous cells and atypical mitosis

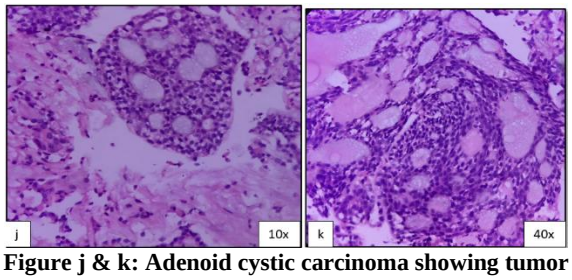


Figure j & k: Adenoid cystic carcinoma showing tumor cells arranged in cribriform pattern with pseudolumen filled with eosinophilic material

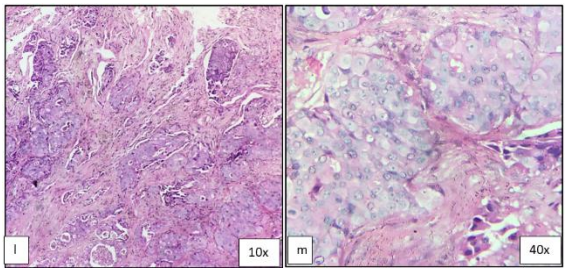


Figure l & m :Adeno carcinoma showing pleomorphic cells arranged in nests and lobules

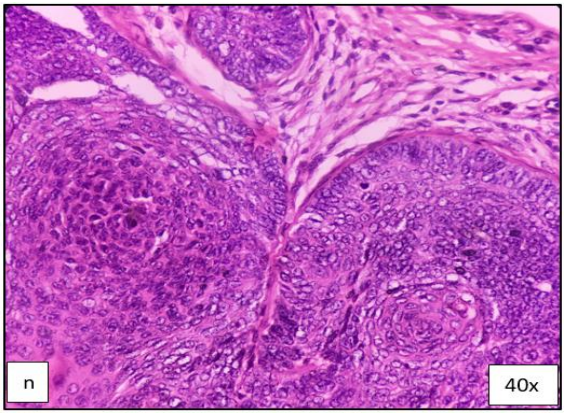


Figure n :Basal cell carcinoma showing basaloid cells arranged in nests and retraction artefacts

DISCUSSION

This five-year retrospective study provides a comprehensive histopathological analysis of neoplastic lesions of the external auditory canal (EAC). Out of 119 specimens, 45 cases (37.8%) were neoplastic, of which 60% were malignant and 40% benign. This finding indicates a predominance of malignancy, a trend observed in tertiary care centers where more advanced or suspicious cases are referred.[2,14]

Comparative analysis of benign EAC tumors shows notable variation in histopathological profiles and gender distribution. Spielmann et al. reported a female predominance (M:F = 1:2), with osteoid osteoma being the most frequent benign lesion (40%), followed by ceruminous adenomas (18%).[12] In contrast, Song et al. observed a symmetrical distribution (M:F = 1:1) with nevi as the predominant lesion (40%) and osteomas accounting for 13%.[11,17] The present study also demonstrated a symmetrical gender ratio (M:F = 1:1), aligning with Song et al.'s observations but differing from the female bias noted by Spielmann et al.[11,12] Osteoid osteoma and capillary hemangioma were the most common benign tumors in our cohort (28% each), followed by squamous papilloma (17%). Other rare lesions included schwannoma, glomus tumor, nevus, and spiradenoma.

These findings are consistent with other studies emphasizing the histological diversity of benign EAC tumors. Kim et al. and Friedmann both reported similar patterns, especially the occurrence of papillomas and hemangiomas, noting the difficulty in distinguishing benign from malignant lesions based on clinical features alone.[10,11]

Table 4: Benign Lesions-Comparitive studies

S.NO	Study	M:F	Most Common
1	Spielmann et..al..;2013	1:2	Osteoid osteoma(40%) Ceruminous adenoma(18%) Others(42%)
2	Song et..al..;2017	1:1	Nevus(40%) Osteoma(13%) Others(47%)
3	Present Study*	1:1	Osteoid osteoma(28%) Haemangioma(28%) Squamous papilloma(17%) Others(27%)

Table 5: Malignant Lesions-Comparitive studies

	Study	M:F	Most Common
1.	Gurgel et.al..,(2009)	1:1	SCC(62.8%) ADC(18.2%) OC(13%) NCT(6%)
2.	K.Ouaz et.al..,(2012)	1:1	SCC(60%) ACC(10%) OC(20%)
3.	S.Zhen et.al..;(2014)	1:1.5	ACC(50%) SCC(31.2%) OC(18%4)
4.	Present Study*	2:1	SCC(81%) ACC(7%) OC(12%)

Malignant tumors of the EAC across studies consistently identify squamous cell carcinoma (SCC) as the predominant pathology. Gurgel et al. reported SCC in 62.8% of cases, followed by adenocarcinoma (18.2%) and other carcinomas (13%).[15] Ouaza et al. documented SCC in 60%, ACC in 10%, and other carcinomas in 20%, with an equal gender distribution.[14] Zhen et al. observed a slight male

predominance (M:F = 1.5:1), with adenoid cystic carcinoma (ACC) as the most common malignancy (50%), followed by SCC (31.2%).[9]

In the present study, SCC was the most frequent malignancy (81%), with ACC and other carcinomas comprising 7% and 12%, respectively. A more marked male predominance (M:F = 2:1) was noted. This gender disparity may be linked to occupational or environmental exposures, as suggested by previous reports.[8,13] Interestingly, an equal distribution of malignant lesions among females in our cohort may reflect changing demographics or healthcare-seeking behavior.

Patients in this study ranged from 4 to 75 years, with peak incidence in the 51–60 age group (37.8%). This aligns with reports from Zhen et al., Lobo et al., and Cazzador et al., all of whom associated SCC and other malignant EAC tumors with older age.[8,9,13] Friedmann noted that malignancies are more prevalent in elderly individuals, while benign tumors often appear in younger patients.[10]

Our malignant-to-benign ratio of 1.5:1 contrasts with community-based findings where benign tumors were more prevalent, as reported by Friedmann.[10] However, it closely parallels other hospital-based studies, such as those by Ouaza et al. and Zhen et al., which also showed a higher rate of malignancies.[9,14]

Histologically, the benign lesions in our study showed significant diversity. Capillary hemangiomas and osteoid osteomas were most common (5 cases each), followed by squamous papilloma (3 cases), schwannoma (2), glomus tumor (1), nevus (1), and spiradenoma (1). These patterns are consistent with those described by Kim et al. and Spielmann et al., who emphasized the clinical and pathological heterogeneity of EAC tumors.[11,12]

Among malignant lesions, SCC was predominant (22 cases; 81%), with ACC (2), basal cell carcinoma (1), adenocarcinoma (1), and small round cell tumor (1) completing the spectrum. The aggressive nature and late presentation of SCC were similarly noted in studies by Lobo et al., Zhen et al., and Ouaza et al.[8,9,14]

CONCLUSION

This study reinforces and extends current understanding of the clinicopathological spectrum of external auditory canal (EAC) neoplasms. A significant predominance of squamous cell carcinoma (SCC) was observed among malignant lesions, consistent with findings in prior large-scale and institutional studies. SCC remains the most common and aggressive malignancy, particularly affecting individuals in the middle-aged to elderly population, with peak incidence in the sixth decade.

Although males were more frequently affected overall, our observation of equal malignant lesion distribution among females may suggest evolving patterns in gender susceptibility—potentially due to changing environmental exposures or healthcare access. Age continues to be a critical factor, as malignant lesions were predominantly seen in older patients, while benign neoplasms were more common in younger individuals, aligning with the findings of Friedmann and others.

The diversity of benign tumors, including rare entities such as osteoid osteoma, schwannoma, and glomus tumor, underscores the diagnostic complexity of EAC lesions. These histological variations have been similarly documented in other studies, emphasizing the need for thorough pathological evaluation.

Given the rarity and varied presentation of both benign and malignant EAC neoplasms, this study highlights the importance of early histopathological diagnosis. The high incidence of malignancies in this tertiary care cohort also suggests the role of referral bias and underlines the need for increased clinical suspicion in atypical or persistent ear canal lesions. Continued multicentric studies and pathological audits are essential to improve diagnostic accuracy, optimize therapeutic strategies, and enhance patient outcomes.

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