Case Report

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A Case of Pyogenic Granuloma in the Middle Ear: An Uncommon Clinical Entity

Ear, Nose and Throat Section

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ABSTRACT

Pyogenic Granuloma (PG) is a benign vascular lesion that typically appears following trauma or irritation. It may also develop in individuals with immunosuppression or as a result of other unclear mechanisms that encourage angiogenesis and vasculogenesis. It is also known as lobular capillary hemangioma, as the endothelial cells are arranged in a characteristic pattern of circumscribed capillaries positioned in lobules. About one-third of PGs are found in the head and neck region, although they are rarely seen in the middle ear. Hereby, the authors present a case of a 60-year-old female patient who presented with ear pain and ear discharge in the right ear. She had a history of a right-sided modified radical mastoidectomy performed six months prior, which was aborted intraoperatively due to profuse bleeding. The histopathological report from that surgery was suggestive of a symplastic glomus tumour. Authors excised the middle ear mass in toto with subtotal petrosectomy, considering the diagnosis of a symplastic glomus tumour, and to authors surprise, the subsequent histopathological report suggested a PG of the middle ear cavity. Hence, the present case highlights the importance of considering PG in the differential diagnosis for previously operated patients with a history of blood-tinged ear discharge and otalgia.

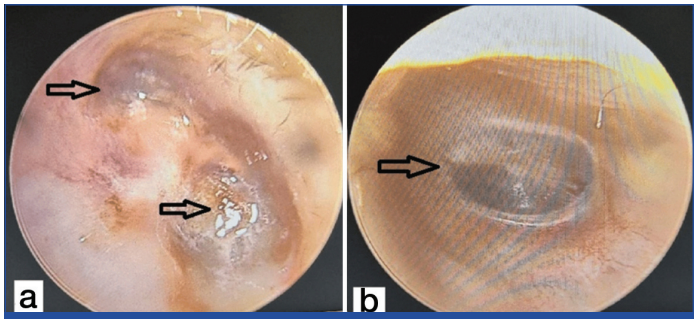
Keywords: Blood-tinged ear discharge, Glomus tumour, Otalgia, Subtotal petrosectomy

CASE REPORT

A 60-year-old female patient presented with complaints of right otalgia for five years, which was insidious in onset, gradually progressive, intermittent, and of a throbbing type, along with right ear discharge for one year. The discharge was insidious in onset, gradually progressive, intermittent, mucopurulent, foul-smelling, and occasionally blood-tinged. The patient also had a history of hot oil instillation in the ear on multiple occasions. Additionally, she reported experiencing high-pitched right ear tinnitus for five years, which was intermittent but did not interfere with her daily life activities. The patient had a history of right aural fullness and reduced hearing in the right ear for five years, which was insidious and gradually progressive. Initially, she could hear normal conversational speech; however, over the past year, she has developed difficulty in doing so. There was no history of any other trauma to the ear or head, and no facial nerve palsy.

The patient underwent a right modified radical mastoidectomy under general anaesthesia in January 2024 in another hospital, which was abandoned due to profuse intraoperative bleeding. The histopathological report from the sample collected during that surgery indicated a well-circumscribed tumour lined by stratified keratinised squamous epithelium. The area underlying the tumour revealed a proliferation of small to medium-sized, blood-engorged vessels, with surrounding smooth muscle and glomus cells organised in nests and broad sheets. The glomus cells showed mild atypia, characterised by round nuclei with fine to coarse hyperchromatic chromatin and inconspicuous nucleoli. The features were suggestive of a symplastic glomus tumour. Following the abandoned surgery, the patient developed right-sided grade II facial nerve palsy.

Thereafter, the patient presented to the hospital with the aforementioned history. On endoscopic examination of the ear, the left ear appeared normal, while the right ear showed a bluish mass behind the tympanic membrane with granulation tissue over the membrane [Table/Fig-1]. The external auditory canal had mild mucopurulent discharge, which was cleaned. Posterosuperiorly, the mastoid cavity and attic were widened. The patient exhibited House-Brackmann grade II facial nerve palsy on the right side [1]. The remainder of the otorhinolaryngological examination was normal.



[Table/Fig-1]: Endoscopic images of the right and left ear:

a) Endoscopic image of the right ear, with the upper arrow denoting the mastoid cavity and the lower arrow indicating the bluish mass behind the tympanic membrane;

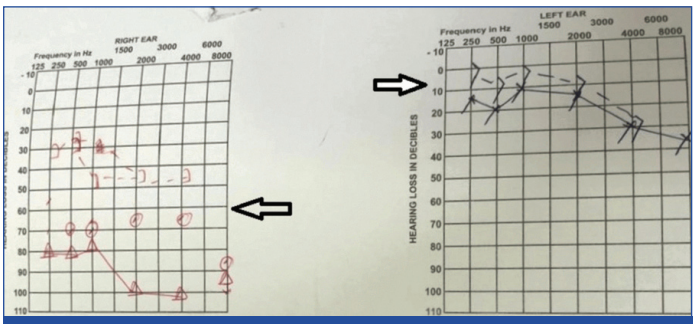
b) Endoscopic image of the left ear, with the arrow indicating the intact tympanic membrane.

All routine blood investigations of the patient were within normal limits, except for haemoglobin, which was 8.1 gm/dL. One pint of packed cell volume was transfused, following which the haemoglobin rose to 9.3 gm/dL preoperatively.

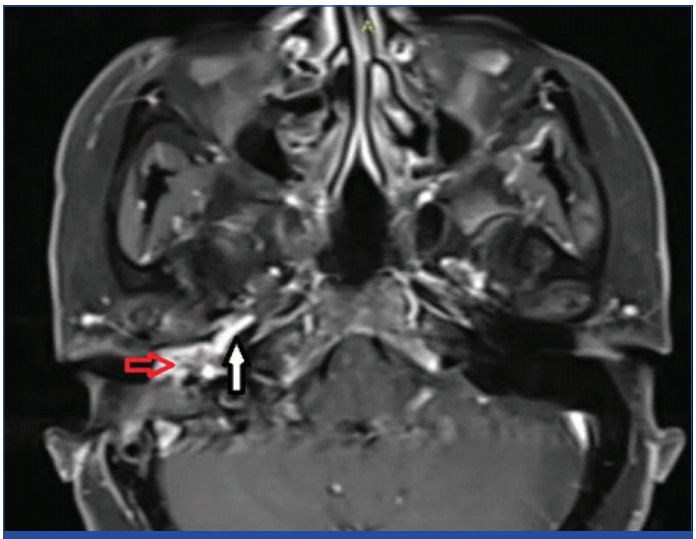
Pure tone audiometry for the patient revealed severe-profound mixed hearing loss in the right ear and normal hearing in the left ear, with minimal hearing loss in the high frequencies [Table/Fig-2].

The patient underwent a plain Magnetic Resonance Imaging (MRI) of the temporal bone, which showed post-right modified radical mastoidectomy changes. It revealed abnormal soft tissue involving the external auditory canal, the mastoid bowl, and the middle ear cavity, opacifying the oval window and round window niches, with complete non visualisation of the middle ear ossicles. Erosion of the anterior and posterior walls of the auditory canal, as well as the cochlear promontory and the tegmen tympani, was noted, along with erosion of the inferior wall of the canal at the tympanic segment of the facial nerve.

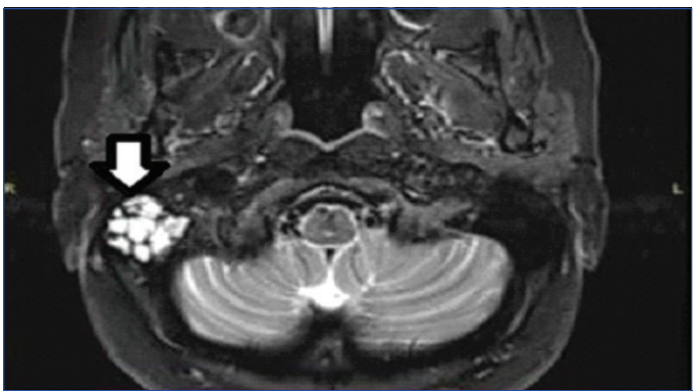
On contrast-enhanced MRI, the patient showed the following findings [Table/Fig-3,4]. Based on the clinical history and imaging, a probable diagnosis of a vascular middle ear tumour was made, with glomus tumour being the most probable type. The patient was then scheduled for right subtotal petrosectomy with tumour excision and facial nerve decompression under general anaesthesia via a post-aural approach using William Wilde's incision.



[Table/Fig-2]: Pure tone audiogram. Arrow without fill: Right ear showing severe-profound mixed hearing loss. White fill arrow: Left ear showing normal hearing with minimal hearing loss at high frequencies.



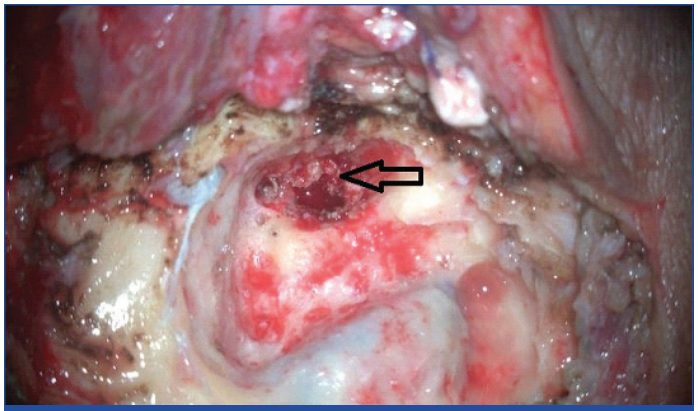
[Table/Fig-3]: MRI showing contrast-enhanced mass in the middle ear (red arrow), extending into eustachian tube (white filled arrow).



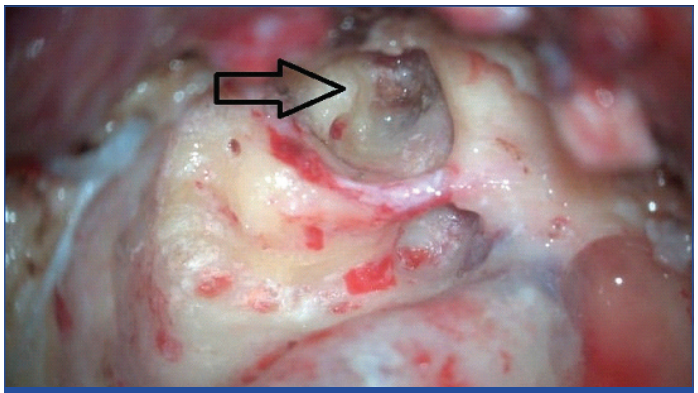
[Table/Fig-4]: T2-W MRI showing fluid in the mastoid air cells.

Intraoperatively, a vascularised mass was observed in the middle ear [Table/Fig-5]. The mass was excised completely, along with complete exenteration of the mastoid air cells [Table/Fig-6]. The postaural wound was closed using mattress sutures [Table/Fig-7]. The tissue obtained intraoperatively was stained with Haematoxylin and Eosin (H&E) stain and sent for histopathological examination. The postoperative period was uneventful, with the patient experiencing no complications related to wound healing, and complete recovery was observed within one month of the surgery.

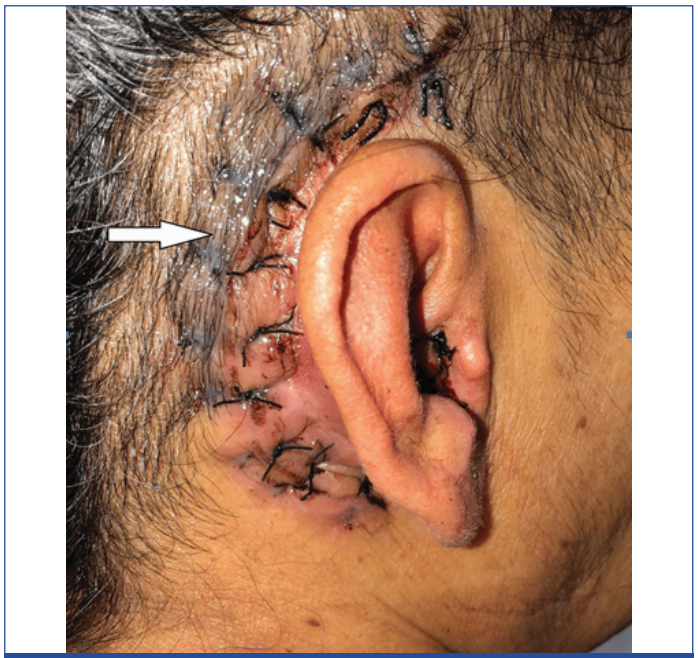
The final histopathological report showed fibro-collagenous tissue with proliferation of capillary vessels, along with mild mixed inflammation.



[Table/Fig-5]: Vascularised mass in the middle ear (Black arrow).



[Table/Fig-6]: Intraoperative image showing complete excision of the mass with completes exenteration of mastoid air cells (black arrow).



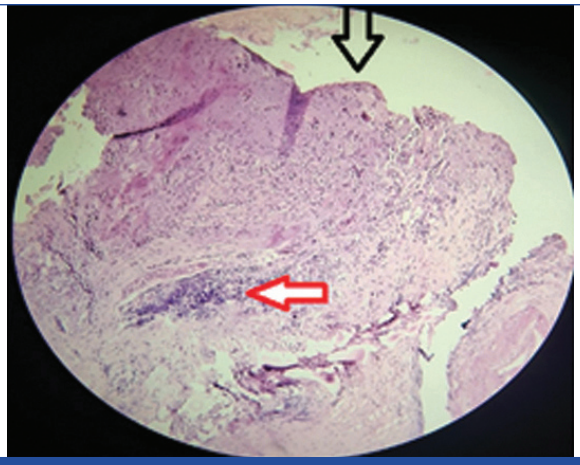
[Table/Fig-7]: Postoperative image of the patient. White solid fill arrow: Post-aural William Wilde's incision closed with mattress sutures.

Foci of foreign body material were also noted, and areas of keratin flakes were present. There was no evidence of granuloma, dysplasia, or malignancy in the sections examined. The features were suggestive of a PG with reparative tissue [Table/Fig-8-10].

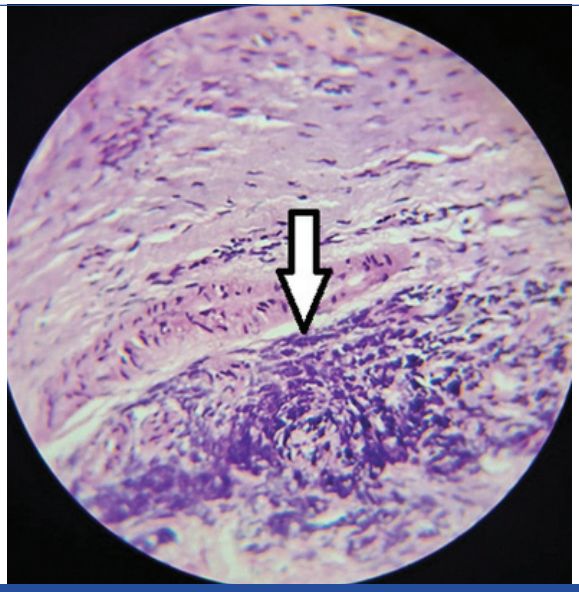
The patient was advised to have regular follow-up visits every three months for a year, and there have been no signs of recurrence at the six-month follow-up.

DISCUSSION

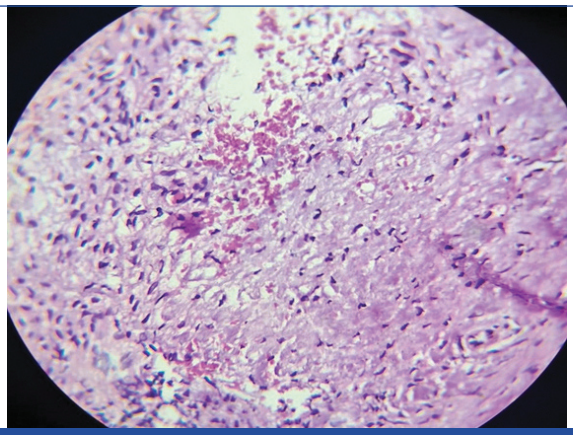
The PG, also known as lobular capillary hemangioma, is a benign vascular lesion that typically develops in response to trauma, chronic irritation, or hormonal influences. It most frequently affects mucosal surfaces such as the oral cavity and skin, whereas its presence in



[Table/Fig-8]: HPE image showing pendunculated mass (black arrow) and a acute inflammation (red white arrow) (H&E, 10X).



[Table/Fig-9]: HPE image showing acute inflammation (white fill black arrow) (H&E, 40X).



[Table/Fig-10]: HPE image showing fibrocollagenous tissue (H&E, 40x).

the middle ear is exceedingly rare and often leads to diagnostic dilemmas with vascular tumours like glomus tumours [2,3].

In the present case, the diagnosis was complicated by an earlier aborted mastoidectomy due to severe intraoperative bleeding. An initial histopathological diagnosis of symplastic glomus tumour, which is a benign but locally aggressive lesion, prompted a more extensive surgical approach involving subtotal petrosectomy. This radical intervention was deemed necessary given the imaging features, risk of bleeding, and the need to decompress the facial nerve.

Clinically, the patient presented with symptoms typical of both PG and glomus tumours, including aural fullness, otorrhoea, otalgia, and tinnitus [4,5]. Radiological findings revealed soft tissue opacification, ossicular erosion, and contrast enhancement features suggestive, but not definitive, for glomus tumours [6]. This underscores the limitations of imaging alone for accurate diagnosis in such cases. Histopathology ultimately confirmed PG, characterised by lobular proliferation of capillaries accompanied by inflammatory infiltrate and reparative changes [7]. Notably, the patient's history of chronic otorrhoea and repetitive instillation of hot oil likely contributed to persistent irritation and trauma-induced angiogenesis, facilitating the development of PG in the middle ear [7,8].

This case highlights several key clinical considerations:

- The essential role of histopathological confirmation prior to the definitive treatment of vascular middle ear lesions.
- The importance of including PG in the differential diagnosis of bleeding middle ear masses, particularly in patients with chronic irritation or previous ear surgery.
- The need for careful surgical planning to avoid overtreatment in the absence of a definitive diagnosis.

Similar diagnostic challenges have been documented in case reports by Park HW et al. and Lee HJ et al., who described PGs in uncommon otologic locations such as the tympanic membrane and external auditory canal, reinforcing the necessity of tissue diagnosis [8,9]. Furthermore, Pistorio V et al. reported a rare middle ear capillary haemangioma clinically indistinguishable from a glomus tumour; definitive diagnosis was obtained intraoperatively via biopsy, emphasising the vital role of histopathology in vascular middle ear masses [10]. Nouri H et al. also described a patient with pulsatile tinnitus and otorrhagia caused by a middle ear capillary hemangioma, which was initially misdiagnosed radiologically as a paraganglioma [11]. Both cases illustrate the significant overlap of clinical and imaging features between PGs, capillary hemangiomas, and paragangliomas/glomus tumours, highlighting the risk of misdiagnosis and overtreatment without histological confirmation.

Surgical excision remains the treatment of choice for PG, with attention to minimising intraoperative bleeding and preserving surrounding structures. Preoperative embolisation may be considered for highly vascular lesions. Follow-up in present case at one year showed no recurrence and symptom resolution, consistent with the benign nature of PG when completely excised [12,13].

CONCLUSION(S)

The present case highlights a rare presentation of PG in the middle ear, mimicking a glomus tumour both clinically and radiologically. It underscores the critical role of histopathological examination in the diagnosis of middle ear vascular lesions. Surgeons should be aware of PG as a differential diagnosis for bleeding middle ear masses, especially in patients with a history of chronic irritation. Accurate diagnosis is essential for guiding appropriate surgical intervention and avoiding overtreatment.

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