



Figure 1. Diagrammatic representation of parotid gland and surrounding structures. (a) Main gland (red star) with tail of the superficial lobe (red arrow). Anterior boundary is by masseter muscle in close relation to the mandibular nerve. The layout of parotid duct should also be understood before surgery (white hollow arrow). (b) Parotid gland is seen in green color with nerve traversing through it (white solid arrow). The tumor location for the ear ring lesion is marked by grey region in the tail region of the gland.



Figure 2. Photo of 41-year-old female enface and profile with left parotid swelling below the ear lobule (horizontal and vertical blue arrows).



Figure 3. Plain X-ray face and cervical region. (a) Lateral and (b) anteroposterior views. There was no evidence of underlying bony or soft tissue abnormality. No calcification seen in both the parotid regions.

Fine needle aspiration cytology (FNAC) was performed and this turns out to be as Warthin's tumor. Histopathology had shown multiple cystic spaces with epithelial papillary infoldings. These were surrounded by two uniform

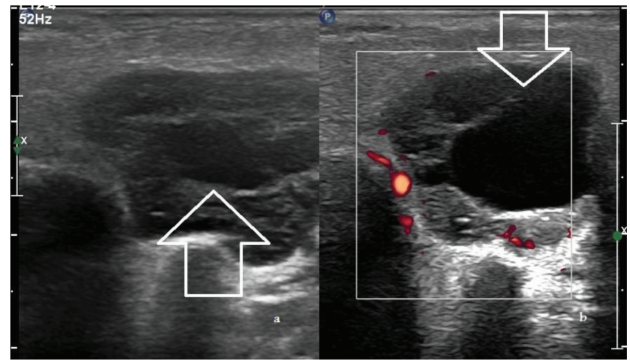


Figure 4. Ultrasonography (USG) of the left side of the face including parotid gland. (a) Long axis US image with high frequency linear probe (7 MHz) shows cystic lesion present in the tail region of superficial part of lobe (white halo arrow). (b) CFI shows no flow in the lesion (inverted halo arrow).

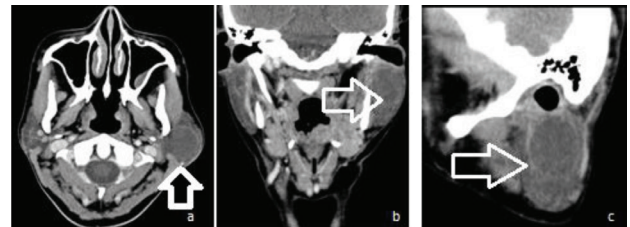


Figure 5. Contrast enhanced computerized tomography. (a) Axial section shows a well-defined "ring like" lesion behind the left mandible (vertical arrow). The lesion shows cystic component surrounded by the enhancing thin capsular wall. (b) Coronal section shows earring type of lesion below the external auditory meatus (horizontal arrow). (c) Left parasagittal section of the head and neck region shows the supero-inferior extent of the earring lesion (horizontal white arrow).

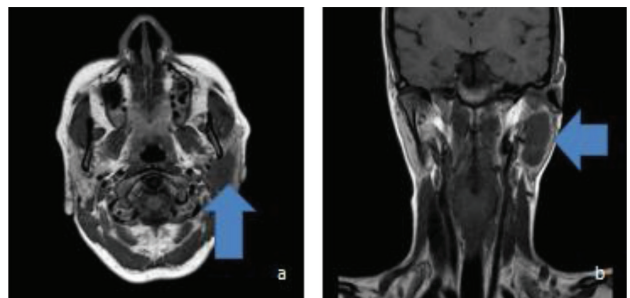


Figure 6. Magnetic resonance images. (a) T1WI axial section shows a well-defined hypointense lesion near the angle of the left mandible (vertical arrow). (b) T1WI coronal section shows the superoinferior extent of hypointense lesion (horizontal arrow).

rows of epithelial cells. The epithelium had lymphoid stroma with germinal center formation. The patient had been advised surgical excision and now on follow up for the same.

Discussion

Hamilton et al. [1] describes the tail as inferior 2 cm of the superficial lobe of the parotid gland. Earring lesions in the tail of the parotids have to be differentiated from those masses which are either arising from sub mandibular

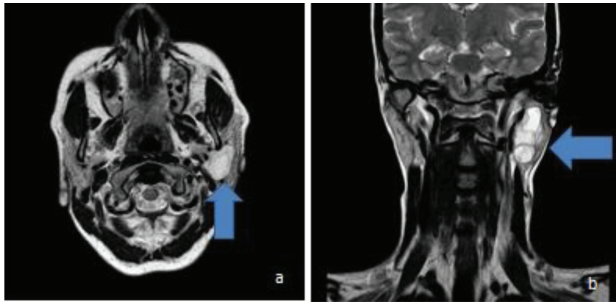


Figure 7. Magnetic resonance images. (a) T2WI axial section shows hyperintense lesion near external auditory meatus (vertical arrow). (b) T2WI coronal section shows the superoinferior extent of hyperintense lesion with well-defined outline (horizontal arrow).

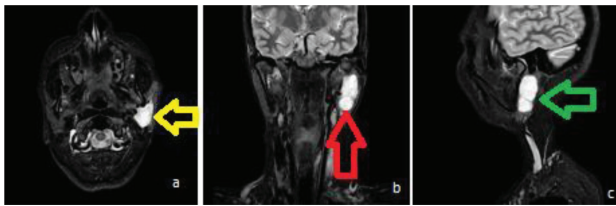


Figure 8. MR STIR images. (a) Axial section shows well-defined hyperintense cystic lesion (yellow arrow). (b) Coronal section shows "earring" type of hyperintense well defined lesion (red arrow). (c) Left parasagittal section shows the lesion at the angle of left mandible (green arrow).

gland or reflected by regional lymph nodes. These lesions are well encapsulated. Superficial layer of deep cervical fascia covers the parotid gland and this is suspended with zygomatic arch. The carotid space is separated from the gland by posterior digastric muscle. The differential diagnosis includes a long list of benign pathologies such as pleomorphic adenoma, Warthin's tumor, infectious process, venous malformations, Sjogren disease, lymphatic malformation, lipoma, HIV lymphoepithelial lesion, first brachial cleft cyst and less likely lesions such as oncocytoma, sarcoid and lymph nodes [2]. Pleomorphic adenomas have 2%–25% chances of malignant degeneration. Malignant lesions at this site could be Non-Hodgkin lymphoma, metastasis, mucoepidermoid carcinoma and undifferentiated carcinomas. The pediatric age group had common atrio-venous malformations at this site [3–5]. Warthin's tumor is also called as papillary cystadenoma lymphomatosum. This is benign tumor of cystic consistency. This does not come with any alarming symptomatology [6,7]. The incidence is more common among the smokers. This requires to be differentiated from oncocytoma and sebaceous lymphadenoma [8,9]. The working diagnosis can be achieved by cross-sectional imaging. Ultrasonography with CFI will highlight the consistency and the vasculature of the tumor. Contrast enhanced computerized tomography (CECT) and contrast enhanced Magnetic resonance imaging (MRI) further shows the tissue characterization and the relationship to the adjoining

structures. Diffusion Weighted Imaging with apparent diffusion coefficient further helped in segregating pleomorphic adenomas from other parotid tumors. FNAC is the initial step for confirming the diagnosis but sometimes histopathological specimen can only be the final answer [10]. The management requires complete surgical excision [11]. There is no incidence of recurrence.

Conclusion

The evaluation of the parotid masses is a very challenging task because of their wide range of nature. This requires thorough evaluation for the management purpose. Cross-sectional imaging plays a pivot role in knowing the anatomical details and some features pointing their nature as per benign or malignant pathologies.

Acknowledgment

The authors would like to thank their Post Graduate student Manav Sethi and Mr Nitish Lacturer of Faculty of Allied Health Sciences for providing them good input about the case and carrying out investigations.

List of Abbreviations

CECT	Contrast enhanced computerized tomography
MRI	Magnetic resonance imaging
CFI	Color flow imaging
FNAC	Fine needle aspiration cytology
STIR	Short tau inversion recovery

Conflict of Interest

There is no conflict of interest.

Funding

None.

Consent for publication

Written consent of the patient was taken.

Ethical approval

Ethical approval is not required at our institution to publish an anonymous case report.

Author details

- Shweta Sharma¹, Bharat Bhushan Sharma², Neeru Kapur³, Shantanu Singh Chauhan³, Mir Rizwan Aziz⁴, Dileep Kumar Jha⁴
1. ENT Speciality registrar Flat No 9, Lakin House, Wawick, UK
 2. Professor and HOD, Department of Radio Diagnosis, SGT Medical College, Gurgaon, India
 3. Assistant Professor, Department of Radio Diagnosis, SGT Medical College, Gurgaon, India
 4. Senior Resident, Department of Radio Diagnosis, SGT Medical College, Gurgaon, India

References

1. Hamilton BE, Salzman KL, Wiggins RH, Harnsberger HR. Earring lesions of the parotid tail. *Am J Neuroradiol.* 2003;24(9):1757–64.
2. Sungur N, Akan IM, Ulsuoy MG, Ozdemir R, Kilinc H, Ortak HT. Clinicopathological evaluation of parotid gland tumors:

- a retrospective study. *J Craniofacial Surg.* 2002;13:26–30. <https://doi.org/10.1097/00001665-200201000-00004>
3. Orvidas LJ, Kasperbauer JL, Lewis JE, Olsen KD, Lesnick TG. Pediatric parotid masses. *Arch Otolaryngol Head Neck Surg.* 2000;126:177–84. <https://doi.org/10.1001/archotol.126.2.177>
 4. Robertson RL, Robson MB, Barnes PB, Burrows PE. Head and neck vascular anomalies of childhood. *Neuroimaging Clin N Am.* 1999;9:115–32.
 5. Jacques DA, Krolls SO, Chambers RG. Parotid tumors in children. *Am J Surg.* 1976;132:469–71. [https://doi.org/10.1016/0002-9610\(76\)90321-4](https://doi.org/10.1016/0002-9610(76)90321-4)
 6. Maiorano E, Muzio L, Lo F, Piattelli GA. Warthin's tumor: a study of 78 Cases with emphasis on bilaterality, multifocality, and association with other malignancies. *Oral Oncol.* 2002;38:35–40. [https://doi.org/10.1016/S1368-8375\(01\)00019-7](https://doi.org/10.1016/S1368-8375(01)00019-7)
 7. Loannidis JP, Vassiliou VA, Moutsopoulos HM. Long-term risk of mortality and lymphoproliferative disease and predictive classification of primary Sjogren's syndrome. *Arthritis Rheum.* 2002;46:741–7. <https://doi.org/10.1002/art.10221>
 8. Urquart A, Hutchins LG, Berg RL. Pre-operative computed tomography scans of parotid tumor evaluation. *Laryngoscope.* 2001;111(Pt1):1984–8. <https://doi.org/10.1097/00005537-200111000-00022>
 9. Huisman TA, Holzmann D, Nadal D. MRI of chronic recurrent parotitis in childhood. *J Comput Assist Tomogr.* 2001;25:269–73. <https://doi.org/10.1097/00004728-200103000-00021>
 10. Zbaren P, Schar C, Hotz MA, Loosli H. Value of fine needle aspiration cytology of parotid gland masses. *Laryngoscope.* 2001;(Pt1):1989–92. <https://doi.org/10.1097/00005537-200111000-00023>
 11. Eisele DW, Johns ME. Complications of surgery of the salivary glands. In: David E (ed.). *Complications in head and neck surgery.* St Louis, MO: Mosby-Year Book Inc.; 1993. pp. 183–200.

Summary of the case

Patient	1	41-years old female
Final Diagnosis	2	Warthin's tumor
Symptoms	3	Swelling and mild pain in the left side of the face
Medications (Generic)	4	Symptomatic
Clinical Procedure	5	-----
Specialty	6	Radiology