Letter to the Editor

The Role of Non-Invasive Imaging in Differentiating LCH and Cholesteatoma in Clinical Practice

Ammara Jamil

Department of ENT, Shifa International Hospital, Islamabad, Pakistan

ORCID iDs of the author: A.J. 0009-0004-8624-2031.

Dear Editor,

I am responding to Gendre et al's article; Cholesteatoma Masquerading as Recurrent Langerhans Cell Histiocytosis. *J Int Adv Otol.* 2023;19(1):70-73. doi:10.5152/iao.2023.22716. Building on their findings, I aim to discuss the potential of non-invasive imaging in differentiating between (LCH) Langerhans cell histiocytosis recurrence and secondary acquired cholesteatoma, and its implications for clinical practice.[1]

THE BENEFIT OF NON-INVASIVE IMAGING TECHNIQUES
While the article highlights the utility of computed tomography (CT) scans in identifying bone erosion and soft tissue mass, emerging evidence suggests that diffusion-weighted MRI (DWI) outperforms CT scans in distinguishing cholesteatoma from LCH, with a diagnostic accuracy of 86.66% vs. 53.33%, making it a critical tool for differentiating postoperative changes from residual disease.[2,3] Diffusion-weighted MRI detects cholesteatoma through restricted water diffusion, appearing hyperintense, whereas LCH lesions lack this feature.[4,5] This makes DWI a highly effective, non-invasive diagnostic tool for early differentiation between the 2 conditions.

That said, imaging modality choice is influenced by several factors, particularly in resource-limited settings. While CT scans are quicker, affordable, and accessible, their soft tissue differentiation limitations make DWI a preferable option for complex cases, despite its higher cost and longer scan times.

IMPLICATIONS FOR CLINICAL PRACTICE
Given the low incidence of secondary acquired cholesteatoma in LCH patients, it is important to weigh the cost and accessibility of routine imaging against the benefit of early detection. While CT scans are more affordable and widely accessible, their limitations in soft tissue differentiation suggest that DWI should be prioritized in specific cases where diagnostic accuracy is paramount, particularly for distinguishing cholesteatoma from LCH. In resource-limited settings, a symptom-driven approach could be employed, where CT scans are used as an initial diagnostic tool, with DWI reserved for complex or ambiguous cases.

CONCLUSION
The case presented by Gendre et al offers valuable insights into the role of imaging in differentiating cholesteatoma from LCH. However, balancing cost, ease of use, and diagnostic accuracy is crucial when considering the routine use of imaging techniques in follow-up care. While CT scans offer a practical and affordable first-line option, DWI should be considered in cases requiring greater diagnostic precision, particularly when differentiating soft tissue masses in patients with a history of LCH. By employing a selective, symptom-driven imaging strategy, healthcare providers can optimize resources while ensuring accurate diagnoses.

Thank you for the opportunity to engage in this important discussion.

Sincerely,

Corresponding author: Ammara Jamil, e-mail: ammarajamil25@gmail.com

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REFERENCES

1. Connor SEJ, Leung R, Natas S. Imaging of the petrous apex: a pictorial review. *Br J Radiol*. 2008;81(965):427-435. [CrossRef]
2. Hamroush YMAE, El-Deek AMF, Abdelazim MH, Ali MAAEM. Optimizing cholesteatoma assessment: utilizing diffusion-weighted magnetic resonance imaging and computed tomography for diagnostic precision and surgical excellence. *Int J Med Arts*. 2024;6(5):4410-4414. [CrossRef]
3. Medany MM, Sabra RM, Hakim EK, Elshafei AMM, Sadawy AMI. Reliability of diffusion-weighted MRI for the diagnosis of residual and recurrent cholesteatoma. *Egypt J Hosp Med*. 2018;72(10):5403-5408. [CrossRef]
4. Kara M, Schwartz JI, Lane BA, et al. Diffusion-weighted imaging for cholesteatoma evaluation. *Ear Nose Throat J*. 2010;89(4):193-198.
5. Gonçalves FG, Manteghinejad A, Rimba Z, Khrichenko D, Viaene AN, Vossough A. Diffusion analysis of intracranial epidermoid, head and neck epidermal inclusion cyst, and temporal bone cholesteatoma. *AJNR Am J Neuroradiol*. 2024. [CrossRef]