Birjand University of Medical Sciences

Journal of Surgery and Trauma

Case Report

Hyalinizing clear cell carcinoma of parotid, intricacies of management: a rare case report

Rohit Bhardwaj[1], Vikas Chauhan[2], Rajni Prasad[3], Ankit Parasher[4], Ashwin N Tripathi[4], Prasann Rasania[5]

[1] Assistant Professor, Department of Otorhinolaryngology, Army College of Medical Sciences, Near Base Hospital, DelhiCantt, India
[2] Chief Medical Officer, Department of Otorhinolaryngology, VMMC and Safdarjung Hospital, New Delhi, India
[3] Director Professor, Department of Pathology, VMMC and Safdarjung Hospital, New Delhi, India
[4] Senior Resident, Department of Otorhinolaryngology, VMMC and Safdarjung Hospital, New Delhi, India
[5] Junior Resident, Department of Otorhinolaryngology, VMMC and Safdarjung Hospital, New Delhi, India

Corresponding Author:
Tel: +919871759227
Email: drrohitbhardwaj90@gmail.com

Abstract

Hyalinizing clear cell carcinoma (HCCC) usually affects minor salivary glands. It rarely occurs in major salivary glands. HCCCis difficult to diagnose in Fine Needle Aspiration cytology (FNAC). The possibility of metastasis from other primary sites should be rejected during the management of these tumors. An elderly manpresented with insidious onset, and gradual progressive painless swelling arising from the deep lobe of the parotid gland. FNAC, which was performedtwice with UltrasoundGuidance(USG), could not provide much detail about the type of tumor. Total conservative parotidectomy was conducted. These rare tumors cause significant challenges to physicians. Thehigh index of suspicion and combined efforts ofthe multidisciplinary team are pivotal in management.

Keywords: Clear Cell Adenocarcinoma, Cytodiagnosis, Fine-Needle Biopsy, Parotid Neoplasms, Salivary Glands

Citation: Bhardwaj R, Chauhan V, Prasad R, Parasher A, Tripathi A N, Rasania P. Hyalinizing clear cell carcinoma of parotid, intricacies of management: a rare case report. J Surg Trauma. 2021; 9(4):171-175.

Received: August 16, 2021 ***Revised: August 26, 2021*** ***Accepted: November 10, 2021***

Introduction

HCCCwas first described as a rare neoplasm of minor salivary glandsin 1994 (1). After almost a decade later, this entity was introduced in the World Health Organization'sHistological Classification of Salivary Gland Tumors (2). The rarity of the tumor can be understood by the fact that minor salivary gland tumors contribute up to 23% of all salivary gland neoplasms and HCCC accounts for less than 0.5% (3). It rarely occurs in major salivary glands. While this tumor affects sites of usual predilection such as minor salivary glands, this type of tumor affects the elderly age group (after forty) with a slight female predominance.Age and gender preference cannot be reliably commented upondue to the extreme scarcity of research literature dealing with its occurrence in major salivary glands. The tumorhistopathologically shows clear cells forming nests and cords in a

[DOI: 10.32592/jsurgery.2021.9.4.106]

hyalinizedstroma. A similar histological structurecan also be seen in many other salivary gland tumors such asclear cell oncocytoma, epithelial-myoepithelial carcinoma, mucoepidermoid carcinoma, clear cell myoepithelial carcinoma, acinic cell carcinoma, andmyoepithelial carcinoma, which makes it a tedious diagnosis of exclusion (4). Metastatic renal cell carcinoma and balloon cell melanoma should also be excluded before confirming as a diagnosis in major salivary glands, as these also share somewhat similar histological findings (5).

In this report, we describe a case of parotid HCCC due to its rarity to sensitize the reader topotential challenges encountered in managing the case (such as diagnostic inaccuracies of "FNAC").HCCC requiresrejection ofhidden primary malignancy, post-operative need for radiotherapy, and long-term follow-up to diagnose recurrence.

Case Report

A 44-year-oldmanwas referredto our Outpatient Department (OPD) with insidious onset, and gradual progressive painless swelling below the right ear for the past one year (Figure 1: Preoperative [A] clinical photograph of the patient).

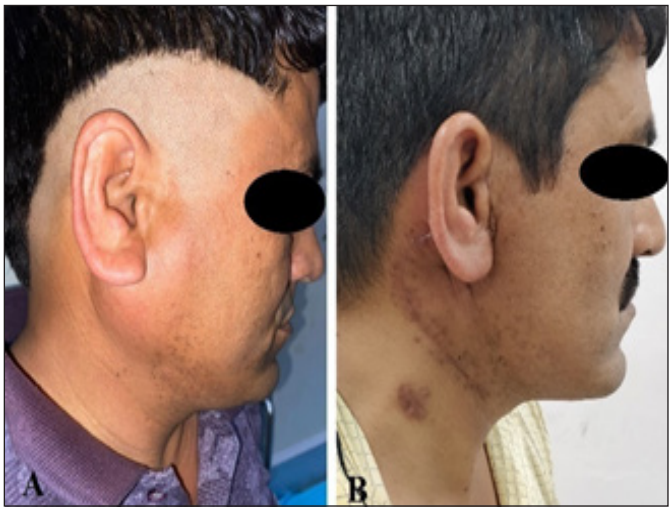

Figure 1: Preoperative (A) and Postoperative (B) clinical photograph of the patient.

The swelling was only aesthetically problematic anddid not cause other symptoms such as fever, pain or restrictions in jaw movements, dryness of mouth, increased swelling after meals, weakness of facial muscle,or ear problems. He had no history of trauma or surgery at the site. On examination, a firm, globular, non-tender swelling was palpated in the right parotid region. The swelling did not adhere to the underlying structures and the overlying skin. Intra-oral examination revealed theright ton silwithminimalmedialdisplacement. Facial nerve function tests suggested no abnormality. Magnetic Resonance Imaging (MRI) showed a well-defined space-occupying lesion with altered signal intensity (iso-intense on T1w and hyperintense on Short-TI Inversion Recovery[STIR]images) in the right parotid gland which mainly involves the deep lobe (Figure 2: Preoperative MRI imaging of the lesion in axial incisions showing ahyperintense lesion). The lesion was extendedtothe right retro-mandibular region with effacement of retro-mandibular veins. However,no significant lymphadenopathy was observedin the neck and the contralateral parotid appeared normal.

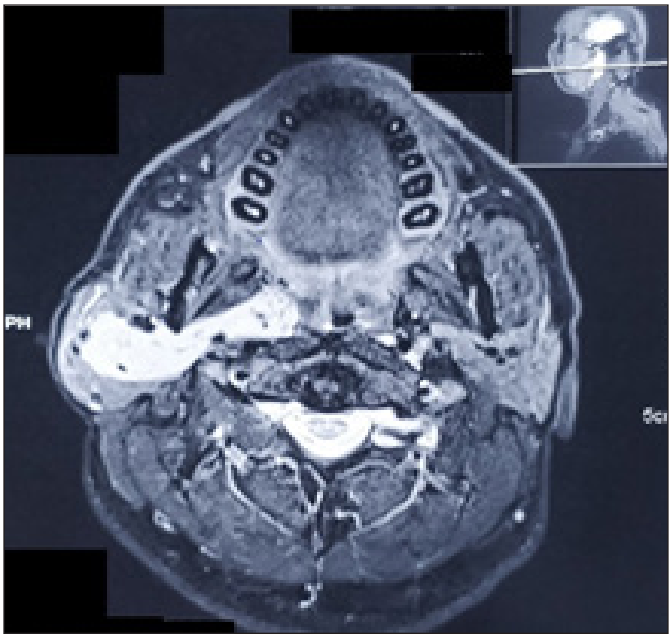

Figure 2: Preoperative MRI imaging of the lesion in axial incisions showing a hyperintense lesion.

Ultrasonography guided FNCA was then performed from the lesion, smears of which showed clusters of polygonal to spindled cells that present mild to moderate pleomorphism at sitesarranged in nests, acinar and papillaroid pattern (Figure 3: FNAC image shows clusters of polygonal to spindle cells that present mild to moderate pleomorphism at sitesarranged in nests, acinar and papillaroid pattern).

[DOI: 10.32592/jsurgery.2021.9.4.106]

Similar results were obtained and the possibility of malignant salivary neoplasm was suggested by repeating the test. The patient was informedofthe diagnosis and was recommended surgical treatment. Informed consent was obtained from the patient for conservative surgery to preserve the facial nervesince there wasno clinical and radiological involvement of the facial nerve along with uncertainty about the histological subtype of tumor.

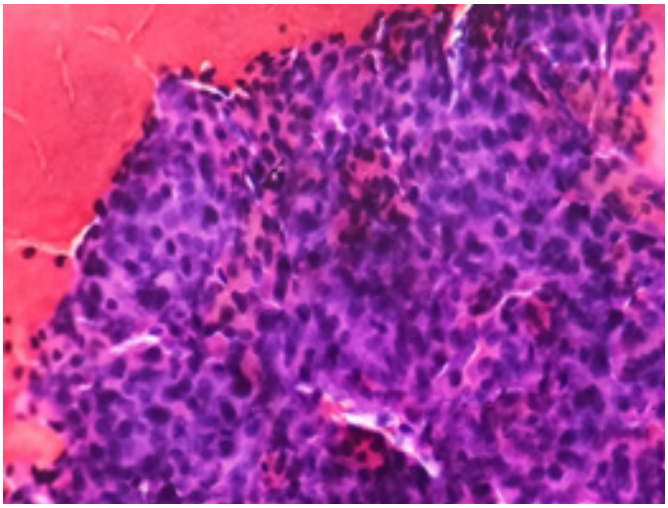

Figure 3: FNAC imageshowsclusters of polygonal to spindle cells that presentmild to moderate pleomorphism at sites arranged in nests, acinar and papillaroid patterns.

Total conservative parotidectomy was performed to incise the lesion. Histopathological examination (HPE) of the postoperative sampleshowed cords, trabeculae, sheets, nets of monomorphic clear epithelial cells, as well as cells with eosinophilic granular cytoplasm, foci of lymphocytic, infiltrate and fibrous to hyalinizedstroma at sites)Figure 4: HPE image showing cords, trabeculae, sheets, nests of monomorphic clear epithelial cells as well as the cell with eosinophilic granular cytoplasm with foci of lymphocytic infiltrate and fibrous to hyalinizedstroma at places [A], Periodic Acid Shiff[PAS]staining [B]Immunohistochemical[IHC] images which presentpositivityof Cytokeratin[C] and Vimentin [D]). Cellular atypia was mild and mitotic figures were rare. No evidenceofperineural or vascular invasion or necrosis was observed.

Immunohistochemical studies of the sampleshowed CK, Epithelial Membrane Antigen (EMA), Vimentin, and PAS positivity. Focal positivity was also reportedfor P63. Sampleswere negativefor Carcinoembryonic Antigen (CEA), S-100, Glial fibrillary acidic protein (GFAP), Smooth Muscle Actin (SMA), CD10, and P16. The possibility of hyalinizing clear cell carcinoma of the deep lobe of parotid was suggestedbased on HPE and IHC findings. The patient was imaged usinga contrast-enhanced computed tomography scan of the abdomen and pelvis to rule out the possibility of renal

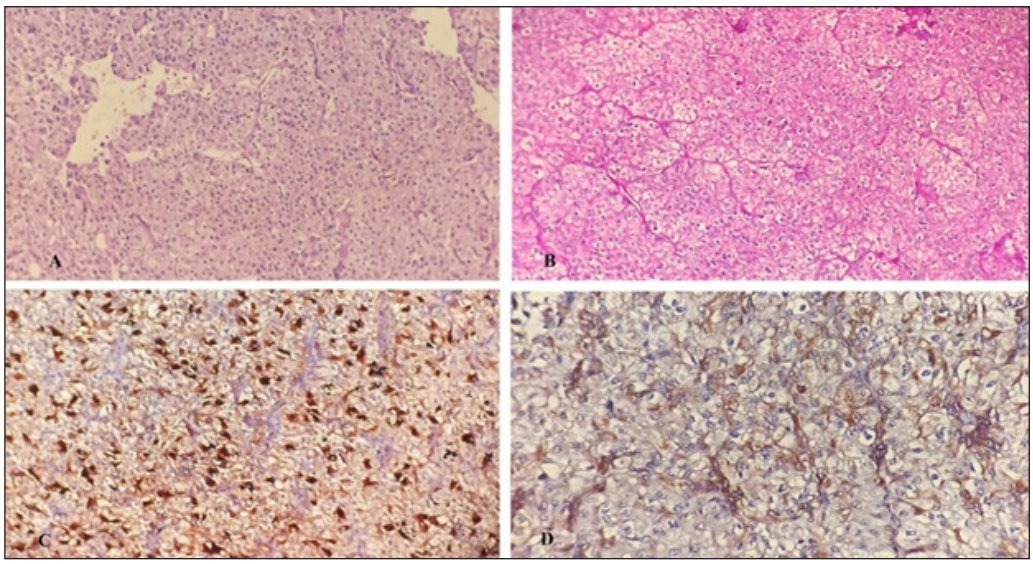

Figure 4: HPE image shows cords, trabeculae, sheets and nests of monomorphic clear epithelial cells, as well as cell with eosinophilic granular cytoplasm with foci of lymphocytic, infiltrate and fibrous to hyalinizedstroma at sites (A), PAS staining (B) IHC images which present positivity of CK (C) and Vimentin (D).

[DOI: 10.32592/jsurgery.2021.9.4.106]

carcinoma metastasizing to the parotid. The patient underwentan MRI scan, 2 months postoperativeto check for the recurrent or residual lesion. Imaging reports were reassuring. Based on these findings, the multidisciplinary team meeting decided to keep the patientunder close follow-up without radiotherapy (Figure 1: Post-operative [B] clinical photograph of the patient). The patient has been followed up for the past 14 months and the disease has not recurred.

Discussion

HCCC is a slowly progressive painless tumor of minor salivary glands which becomes symptomatic only after attaining a defined size ina particular site. This lesion usuallyaffectsthe elderly with slight female preponderance (6). It rarely occurs in major salivary glands. This tumorindicateslocal aggressive behavior withthe potential for local and distant metastases along with the possibility of recurrence (although not very common). Therefore, it has been mentioned as a low-grade malignancy of salivary glands (2-7). Trabeculae and islands of clear cells in a hyalinizedstroma are characteristic appearances of HCCC. Smaller cells with eosinophilic cytoplasm and areas of squamous metaplasia can also be occasionallyseen (8). Even though FNAC canaccurately diagnose parotid lesions with a diagnostic accuracy of 94% (9), it is not applicable for HCCC as itscytomorphological features overlap with other parotid lesions, making it a tedious and indeterminate process. Aciniccell carcinoma, clear cell oncocytoma, epimyoepithelial carcinoma, sebaceous lymphadenoma, metastatic clear cell carcinoma of the kidney can all appearwith somewhat similar cytomorphological findings. In this case,the tumor also caused a diagnostic challenge and despite conductingUSG guided FNAC twice, we could not confirm the type of the tumor. This error is acceptablesincethe tumor tissue obtained by FNAC might not always have typical features.

HPE of tumor tissue is also incapable of giving adefinitive diagnosis by rejecting the aforementioned possibilities, thereforeIHC studies are very important for this purpose. Expression of Cytokeratins, CEA, and EMA as IHC markers is commonin “CCC” (clear cell carcinoma) of salivary gland origin with simultaneous lack of expression of myoepithelial markers like S-100, glial fibrillary acid protein and Actin is necessary fordiagnostic confirmation (10). As clear cell carcinoma in parotid can metastasize from kidneys, the immunoreactivity with CD10 (a membrane-associated marker, present in renal CCC and not in primary parotid CCC) is equally usefulin rulingout this possibility (11). Expression of P63 is also more common in HCCC but it is never expressed by renal cell carcinoma (12-13). In this patient,IHC was positive for CK, EMA Vimentin, and PAS, focal positivity for P63, and negative for CEA, S-100, GFAP, SMA, CD-10, and P16. The possibility of metastatic carcinomas should also be radiologically rejected (we also rejected in this case).

Although considered as a low-grade malignant neoplasm, it microscopicallyshows local infiltration. Perineural and vascular invasion is also commonly observed (1). The tumor also tends to recur along with the occasional possibility of lymph node and distant metastasis (1-14). Treatment with complete surgical excision is sufficient in most cases of HCCC, however, neck dissection and radiotherapy havealso been used in managing this tumor (1-7). Histologic tumor grade, perineural and vascular invasion, positive surgicalmargins, and the presence of lymph node metastasis are the major determinants of neck dissection or postoperative radiotherapy (15). In our case, the patient had no lymph node metastasis as suggested by preoperative imaging. HPE assessment of the resected samplesalso showed no perineural or vascular invasion or positive resection margins which eliminates the need for neck dissection or radiotherapy.

Conclusion

HCCC of the parotid gland is a rare and distinct clinical entity thatimposes many challenges to physicians as well as pathologists. Although FNAC hasgood diagnostic accuracy for parotid lesions,the clear diagnosis of this tumor is not always possible by needle aspiration cytology. Also, confirming the diagnosis of HPE is a complicated task and demandsan evaluation by IHC studies. Elimination

[DOI: 10.32592/jsurgery.2021.9.4.106]

of the possibility of other metastaticprimary malignanciescannot be underestimated in management and requires the contribution ofIHC and imaging studies. A high index of suspicion in diagnosis, meticulous surgery, and thorough follow-up is needed in the satisfactorymanagement of these tumors.

Acknowledgment

The authors would like to express their sincere appreciation to Krishna Sarraf for her valuable technical support.

Conflict of interest

The authors declare that there is no conflict of interest regarding the publication of the present study.

References

1.Weinreb I. Hyalinizing clear cell carcinoma of salivary gland: a review and update. Head Neck Pathol. 2013;7Suppl 1(Suppl 1):20-29. doi:10.1007/s12105-013-0466-8

2. Yang S, Zhang J, Chen X, Wang L, Xie F. Clear cell carcinoma, not otherwise specified, of salivary glands: a clinicopathologic study of 4 cases and review of the literature. Oral Surg Oral Med Oral Pathol Oral Radiol Endod. 2008;106(5):712-720.

3. Agrawal J, Kumar Y, Damera D, Kumar S. Clear cell carcinoma of minor salivary gland: A case of clinical dilemma. Contemp Clin Dent.. 2014;5(3):389-392.

4. Rinaldo A, McLaren K, Boccato P, Maran A. Hyalinizing Clear Cell Carcinoma of the Oral Cavity and of the Parotid Gland. ORL. 1999;61(1):48-51.

5. Solar A, Schmidt B, Jordan R. Hyalinizing clear cell carcinoma. Cancer. 2008;115(1):75-83.

6. Rodriguez M, Reija M, Rodilla I. Primary clear cell carcinoma of parotid gland: Case report and review of literature. J Oral Maxillofac Pathol.. 2013;17(1):101-105.

7. Ponniah I, Lavanya N, SureshKumar P. Island of salivary gland in adipose tissue: a report of three cases. J Oral Pathol. 2007;36(9):558-562.

8. Berho M, Huvos A. Central hyalinizing clear cell carcinoma of the mandible and the maxilla a clinicopathologic study of two cases with an analysis of the literature. Human Pathology. 1999;30(1):101-105.

9. Ali N, Akhtar S, Junaid M, Awan S, Aftab K. Diagnostic Accuracy of Fine Needle Aspiration Cytology in Parotid Lesions. ISRN Surgery. 2011:1-5. doi:10.5402/2011/721525

10. Seijas B, Franco F, Sastre R, García A, López-CedrúnCembranos J. Metastatic renal cell carcinoma presenting as a parotid tumor. Oral Surg Oral Med Oral Pathol Oral Radiol. 2005;99(5):554-557.

11. Yang B, Ali S, Rosenthal D. CD10 facilitates the diagnosis of metastatic renal cell carcinoma from primary adrenal cortical neoplasm in adrenal fine-needle aspiration. Diagn Pathol. 2002;27(3):149-152.

12. Antonescu C, Katabi N, Zhang L, Sung Y, Seethala R, Jordan R et al. EWSR1-ATF1 fusion is a novel and consistent finding in hyalinizing clear-cell carcinoma of salivary gland. Genes Chromosomes Cancer.2011;50(7):559-570.

13. McHugh J, Hoschar A, Dvorakova M, Parwani A, Barnes E, Seethala R. p63 Immunohistochemistry Differentiates Salivary Gland Oncocytoma and Oncocytic Carcinoma from Metastatic Renal Cell Carcinoma. Head Neck Pathol. 2007;1(2):123-131.

14. Wang B, Brandwein M, Gordon R, Robinson R, Urken M, Zarbo R. Primary Salivary Clear Cell Tumors—A Diagnostic Approach. Arch Pathol Lab Med. 2002;126(6):676-685.

15. Vander Poorten V, Balm A, Hilgers F, Tan I, Keus R, Hart A. Stage as major long term outcome predictor in minor salivary gland carcinoma. Cancer. 2000;89(6):1195-1204.

[DOI: 10.32592/jsurgery.2021.9.4.106]