ISSN: 2581 – 3633
PubMed - National Library of Medicine - ID: 101745081

International Journal of Medical Science and Advanced Clinical Research (IJMACR)

Available Online at:www.ijmacr.com

Volume – 8, Issue – 1, February - 2025, Page No. : 193 – 198

Sinonasal Small Cell Neuroendocrine Carcinoma: A Rare Case Report

[1]Dr. Sonal Upadhyay, Post Graduate Student, Department of Oral Pathology & Microbiology, Bareilly International University, Institute of Dental Sciences, Bareilly (U.P.).

[2]Dr. Madhusudan Astekar, Professor & HOD, Department of Oral Pathology & Microbiology, Bareilly International University, Institute of Dental Sciences, Bareilly (U.P.)

[3]Dr. Himanshu Sharma, Professor, Department of Oral and Maxillofacial Surgery, Bareilly International University, Institute of Dental Sciences, Bareilly (U.P.)

Corresponding Author: Dr. Madhusudan Astekar, Professor & HOD, Department of Oral Pathology & Microbiology, Bareilly International University, Institute of Dental Sciences, Bareilly (U.P.)

How to citation this article: Dr. Sonal Upadhyay, Dr. Madhusudan Astekar, Dr. Himanshu Sharma, "Sinonasal Small Cell Neuroendocrine Carcinoma: A Rare Case Report", IJMACR- February - 2025, Volume – 8, Issue - 1, P. No. 193 – 198.

Type of Publication: Case Report

Conflicts of Interest: Nil

Abstract

Sinonasal small cell neuroendocrine carcinoma are uncommon, extremely rare but aggressive neoplasm that can arise in the sinonasal region. The tumour usually occurs in the lungs, but extrapulmonary form may also be seen in the paranasal sinuses & nasal cavity. However, tumours of the paranasal sinuses are rare. Middle aged males are commonly affected. Tumour presents with a strong propensity for regional recurrence and distant metastasis, resulting in poor prognosis. Diagnosis is challenging and relies on immunohistochemical evaluation. There are no specific recommendations pertaining to the management but multimodal therapy is advocated. Most patients present at advanced stages due to the lack of significant symptoms. Here by reporting a case of sinonasal small cell neuroendocrine carcinoma in a female patient aged 45 years with clinical presentation, histopathological diagnosis, and immunohistochemistry.

Keywords: small cell carcinoma, paranasal sinuses, nasal cavity, prognosis, immunohistochemistry, oat cell Carcinoma

Introduction

Small cell neuroendocrine carcinoma in the sinus (SNEC) is among the rarest, aggressive tumor of the nasal cavity and paranasal sinuses with very few cases included in the literature.(1) While neuroendocrine carcinoma is mostly pulmonary, with 2.5–5% of instances occurring extrapulmonary in the paranasal sinuses and nasal cavity. (1) There have only been 76

cases documented in the literature since Ray Chowdhuri originally characterised it in 1965.[2] There is a male gender propensity with a mean age of about 50 years. Nasal cavity is the most common location followed by ethmoid sinus and maxillary sinus.[3] Advanced tumors may invade the skull, orbit, or brain.[4] Patients may present with swelling, nasal obstruction, headache, pressure, and epistaxis.[1]

Diagnosis is challenging and relies on immunohistochemical evaluation. Histopathologically, dense cellular tumors arranged in ribbons, cords, and sheets having high ratios of nucleus to cytoplasm and brisk mitotic activity is seen. [1] Immunohistochemistry reveals neuroendocrine markers expression. Treatment modalities vary greatly and include chemotherapy, radiotherapy, surgery, or a combination of modalities. [1] These cancers can be quite aggressive and often identified at advanced stage. [5] Although the tumor is responsive to initial local therapy, it is associated with frequent local recurrence and new distant metastasis, leading to poor prognosis. [6] Here by presenting a case of SNEC in a female patient aged 45 years.

Case Report

A 45-years-old, female patient reported to the out-patient department with a chief complaint of swelling on right side of face in the past 2 months. History of present illness revealed that swelling was sudden in onset and was associated with occasional pain. Pain was on right side of face, lasts for few minutes, intermittent and radiated to the eye, started on its own & relieved on taking medication. There was no significant medical and family history. General physical examination showed all vital signs under normal limits.

On extraoral examination (Figure 1), upon inspection, there was solitary swelling present on right side of face, oval, 6x7 cm in size, of normal color, with diffuse margins, smooth surface & no visible pulsations. Upon palpation, all inspectory results were verified, and swelling was tender, firm in consistency. Temperature, fluctuation, mobility, compressibility, translucency, and palpable pulsations were not present. On intra-oral examination (Figure 2), upon inspection, upper right buccal vestibule was inflammed and obliterated. An ulcer was present in right maxillary buccal vestibule, which was solitary, 3x4 cm in size, with irregular, everted and indurated margins, and discharge present with inflamed surrounding area. Upon palpation, confirmed all the inspectory findings, with slight tenderness. Thus, the working diagnosis of Squamous Cell Carcinoma was made. Differential diagnosis includes melanoma & basal cell carcinoma.

Figure 1: Extraoral picture displaying swelling on right side mid face region.

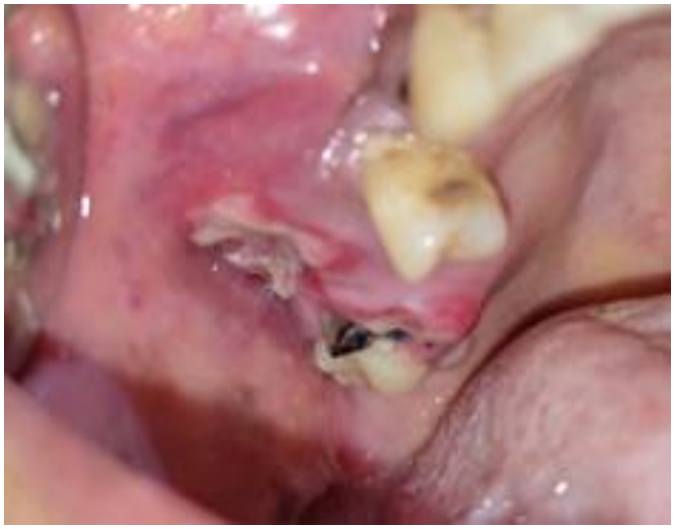

Figure 2: Intraoral picture showing an ulcer in maxillary right buccal vestibule, 3x4 cm in size with irregular, everted, indurated margins & inflammed surrounding area.

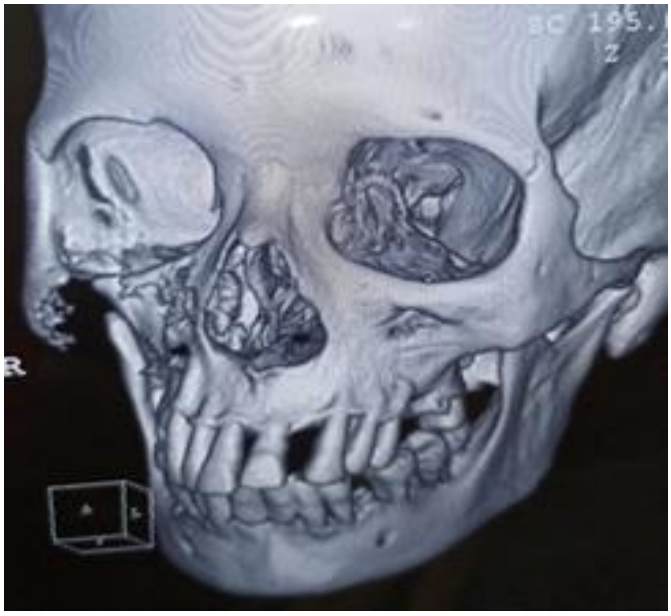

Figure 3: The 3-D face computed tomography showed bone destructive lesion & perforations extending in the right maxilla & orbit.

Institutional ethical committee approval is usually not required. However, a signed informed consent in the vernacular language was obtained from the patient. Hematological investigations were within normal limits. 3-D face Computed Tomography showed bone destructive lesion and perforations extending in the right maxilla and also involving the right orbit (Figure 3). Incisional biopsy was performed. Gross pathology showed three pieces of tissues, brownish in color, irregular in shape, rough surface texture, and soft in consistency. All the bits were taken for histopathological evaluation. Haematoxylin & Eosin-stained section under scanner & low power view showed three pieces of tissues with irregular mucosal epithelium overlying connective tissue stroma. The connective tissue demonstrates multiple large glandular structures and solid islands/ irregular sheets composed of hyperchromatic cells (Figure 4). Under higher magnification, tumor cells lining the periphery of glandular structures were cuboidal to columnar showing proliferative epithelial component protruding into the lumen. Round to oval dark hyperchromatic cells were also appreciated. The tumor cells display dysplastic changes. The overall histopathologic characteristics suggested Adenocarcinoma, most probably of sinonasal origin.

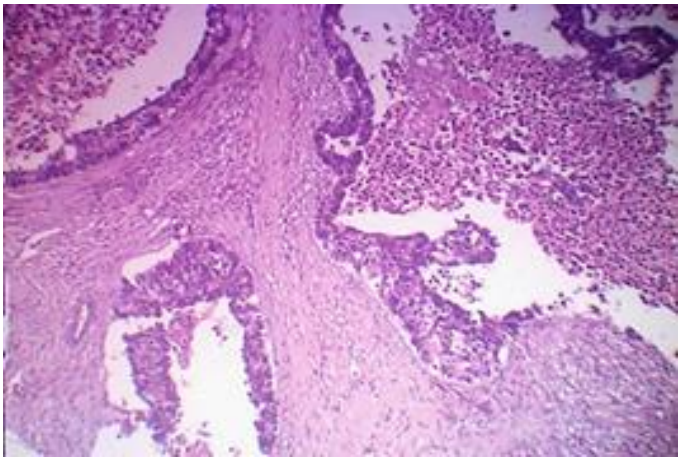

Figure 4: Photomicrograph showing irregular epithelium overlying stroma, which demonstrates solid islands/irregular sheets composed of hyperchromatic cells & tumor cells showing dysplastic changes (H & E, 10 X).

So for exact typing and confirmation of the diagnosis, immunohistochemistry was performed and panel of immunohistochemical markers were used in which CD117 was moderate focal positive (Figure 5), Synaptophysin (Rabbit Monoclonal, PathnSitu) and TTF1 (Rabbit Monoclonal, PathnSitu) were diffuse strong positive (Figure 6), Chromogranin (Rabbit Polyclonal, PathnSitu) was weak to moderate in diffuse staining, CK7 (Mouse Monoclonal, PathnSitu) was positive, P16 (Mouse Monoclonal, Bio-genex) was moderate positive, CDX2 was moderate diffuse positive, PanCk was diffuse strong positive, Ki67 was 55-60%, P63 was focal positive and P40 (Rabbit Monoclonal, Master Diagnostica), CK20 (Mouse Monoclonal, PathnSitu), S100 (Rabbit Monoclonal, PathnSitu) were negative. So, the final diagnosis of Sinonasal Neuroendocrine Carcinoma (small cell type) was made. Patient was further advised for SMARCA 4/ BRG 1 Mutation testing. Patient was referred to higher center for complete surgical removal along with chemotherapy or radiotherapy.

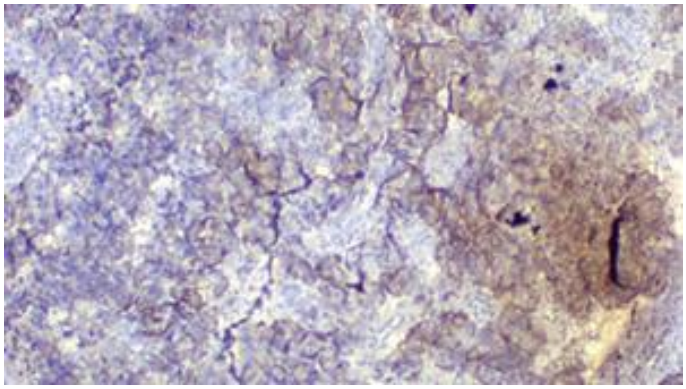

Figure 5: The Photomicrograph showing immunohistochemical moderate focal positivity for CD117

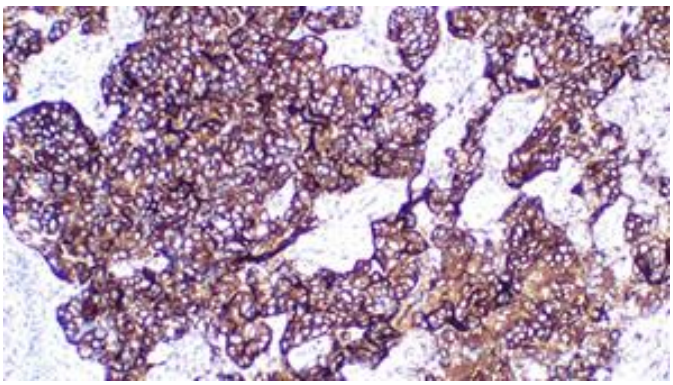

Figure 6: The photomicrograph showing immunohistochemical diffuse strong positivity for Synaptophysin

Discussion

Sinonasal small cell neuroendocrine cancers are believed to develop from multi-potential stem cells. [2] Their occurrence in the extrapulmonary sites are uncommon, constituting from 2.5 to 5% of cases, and they have a dismal prognosis with a 13% five-year survival rate.[3] It was first recognized as an entity by Silva, et al., in 1982 and further described by Millis, et al., in 2002. [5] 76 cases of small cell neuroendocrine carcinoma of the nasal and paranasal regions have been reported in the literature over the previous 45 years. [6] Neuroendocrine carcinoma has been classified into four types- carcinoid, atypical carcinoid, large cell neuroendocrine carcinoma and small cell neuroendocrine carcinoma. [2] There is a preference for men, with a mean age of almost 50 years while in this case female patient aged 45 years was reported. [3] There is no racial predilection. The clinical features of SNEC are nonspecific & resembles to other sinonasal malignancies [7]. Nasal cavity is the most common location followed by ethmoid sinus and maxillary sinus but in this case right maxilla was involved along with right orbit [3]. Advanced tumors may invade the skull, orbit, or brain [5]. Distant metastases may occur in lung, liver & bone [8]. Individuals may

present with nasal obstruction, discharge, headache, pressure, and epistaxis [1], while in this case swelling, ulcer and occasional pain was present. There can be local tumor or extensive stage. Local tumor is defined as tumor limited to the primary location and regional lymph nodes, while tumors extending beyond locoregional boundaries are classified as extensive stage, while in the present case only local tumor spread in orofacial region was seen.

Histopathologically, the lesion typically demonstrates infiltrative nests of tumor cells in the fibrous stroma, [1] in the shape of ribbons, cords, islands, and sheets. Increased nuclear to cytoplasmic ratio, hyperchromatism, pleomorphism and abnormal mitotic activity was also evident, [1] as seen in the present case. Immunohistochemistry reveals expression of neuroendocrine markers like Synaptophysin, Chromogranin, TTF1 & CD117 whereas, P40, CK20, & S100 markers were negative. Synaptophysin is a synaptical vesicle protein present in neuroendocrine cells & neoplasm. Chromogranin is a neuroendocrine secretary protein located in secretary vesicles of neurons. Thyroid transcription factor (TTF1) protein is seen in thyroid & lung tissue. CD117 is a marker specific for stem cells.

Treatment modalities varies accordingly and include chemotherapy, radiotherapy, surgery, or all of them combined. [3] Chemotherapy may be saved for locally advanced cancer, although radical surgery and definitive radiotherapy may be considered in cases of early or circumscribed disease. Although the tumor is responsive to initial local therapy, it is associated with frequent distant metastasis and local recurrence, which leads to poor prognosis [5] with a low five-year survival rate. There is no difference in the survival rate for various stages of this tumor [9]. In the present case report, patient was referred to higher center for treatment where chemotherapy was carried out.

Conclusion

Small cell neuroendocrine carcinoma of sinonasal region is a very rare, complex, and variable disease. It is defined by a diverse range of pathologies and tumor behaviors. It poses a diagnostic challenge due to myriad of presenting symptoms and difficult pathologic diagnosis. It is associated with distant metastasis, local recurrence, and poor prognosis. The most popular approach is still multimodality treatment.

References

1. Chapurin N, Totten D J, Louis P C, Lewis J S, Chowdhary N I, Turner J et al. Sinonasal Small Cell Carcinoma – Case series of a rare malignancy. Ear, Nose & Throat Journal. 2022;101(6): 392-395.
2. Krishnamurthy A, Ravi P, Vijayalakshmi R, Majhi U. Small cell neuroendocrine carcinoma of the paranasal sinus. National journal of Maxillofacial Surgery. 2013; 4(1): 111-113.
3. Chen L Y., Chang S L, Lee W Y. Primary small cell neuroendocrine carcinoma in the nasal cavity. Medicine 2021; 100(35): 1-5.
4. Krishna Y, McCormick A, Coupland S E. Primary sinonasal neuroendocrine carcinoma invading the orbit. Diagnostic histopathology 2020; 26(4):188-91.
5. Keilin C A, Vankoevering K K, McHugh J B, McKean E L. Sinonasal neuroendocrine carcinoma: 15 years' experience at a single institution. J Neurol Surg B skull 2023; 84:51-59.
6. Khan M, Nizami S, Mirrakhimov A E, Maughan B, Bishop J A, Sharfman W H. Primary small cell neuroendocrine carcinoma of paranasal sinuses. Case reports in medicine 2014:1-4.

7. Sirsath N T, Babu K G, Das U, Premlatha C S. Paranasal sinus neuroendocrine carcinoma: A case report. Case reports in oncological medicine 2013:1-5
8. Kaygusuz I, Elkiran T E, Cobanoglu B, Yalcin S. Small cell neuroendocrine carcinoma of the nasal cavity and paranasal sinuses: Report of one case & review of literature. KBB Forum 2016; 15(1): 23-27.
9. Wang J, Fan Y, Chen X, Xue T, Chen F. Primary small cell carcinoma in nasal cavity and paranasal sinuses: 15 cases from a single center. Ear, Nose & Throat Journal 2021: 1-7.