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A complete pathological response to preoperative chemotherapy in a male patient with primary neuroendocrine breast cancer: a case report

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Abstract:

Background: Primary neuroendocrine carcinoma (small-cell carcinoma) of the breast is a rare tumor; most cases are reported in women. Small-cell carcinoma is a type of neuroendocrine tumor characterized by high-grade, poorly differentiated, and aggressive behavior, which are common features regardless of the tumor's location. Here, we present a rare case of primary small-cell carcinoma of the breast in a male patient treated successfully with neoadjuvant chemotherapy followed by surgery.

Case presentation: A 47-year-old Syrian man presented with a left breast mass. Further histopathological investigation revealed the diagnosis of high-grade small-cell carcinoma of the breast. Computed tomography imaging excluded other potential primary origins. The patient was treated with neoadjuvant chemotherapy (cisplatin and etoposide), followed by a modified radical mastectomy. After 18 months of diagnosis, the patient is under surveillance and is doing well.

Conclusion: This report presents a rare case of male breast cancer with the uncommon histological diagnosis of small-cell carcinoma. It highlights a successful therapeutic approach in the absence of established treatment guidelines.

Keywords: Breast cancer; Male; Small-cell carcinoma; Neuroendocrine; Complete pathological response; Case report

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1. Introduction

Globally, breast cancer is the second most commonly diagnosed cancer, while in Syria it represents the most prevalent cancer (21.5% of all cases in both sexes).[1], [2] Less than 1% of all breast cancer cases occur in men.[3] Invasive ductal carcinoma is the most frequent histologic type of primary male breast cancer, representing about 85% of reported cases. Papillary carcinoma is the second most common subtype, accounting for approximately 2.6% of cases, and it occurs about twice as often in men compared to women. Lobular carcinoma is rare in males, comprising only 1–1.5% of cases. Invasive mucinous carcinoma is also uncommon, representing just around 1% of male breast cancers.[4], [5] Neuroendocrine neoplasms arise from neuroendocrine cells distributed throughout the body, most commonly found in the gastrointestinal tract and respiratory system. Primary neuroendocrine breast carcinoma (NEBC) is exceedingly rare, constituting less than 0.1% of all breast cancers and less than 1% of all neuroendocrine tumors.[6], [7]

According to the WHO Classification of Breast Tumors, neuroendocrine neoplasms of the breast are categorized as either neuroendocrine carcinomas, which include small-cell and large-cell carcinomas, or breast neuroendocrine tumors NETs, which are defined as invasive carcinomas of histological grade 1 or 2 displaying neuroendocrine morphology and extensive expression of neuroendocrine markers.[8] NEBC exhibits similar morphological and phenotypic features to their counterparts arising in the gastrointestinal and respiratory tracts.[9] There are no specific clinical or radiological features of this subtype of breast cancer. Furthermore, their optimal treatment has not been clearly defined. In this report, we present a case of small-cell breast carcinoma in a male patient, notable for its rare clinical and imaging features as well as its treatment course.

2. Case Presentation

A 47-year-old Syrian male, a non-smoker and non-alcoholic with no medical or family history, presented to Albairouni University Hospital in January 2024 with a suspicious mass in the left breast, which he had first noticed two months earlier.

On physical examination, a solid, non-tender, irregular mass measuring approximately 1 x 1.5 cm was found in the upper outer quadrant of the breast. No axillary lymphadenopathy or other abnormal findings were noted.

Breast ultrasound revealed a lobulated, partially circumscribed parenchymal lesion measuring 11 x 18 mm, highly suggestive of malignancy, along with a small (6 mm) axillary lymph node. A computerized tomography (CT) showed no evidence of lung, pancreatic, adrenal, or pelvic masses except a transverse axial scan showed an 18 x 10 mm mass in the left breast with a small (6 mm) axillary lymph node and no other abnormalities were noted (Fig. 1).

A core needle biopsy of the breast mass was performed, and histopathological examination indicated poorly differentiated NEBC (small-cell carcinoma) (Fig. 2A).

This was confirmed through immunohistochemical staining, which showed positivity for synaptophysin and CK (weakly positive), negativity for HER2, and a Ki-67 proliferation index exceeding 70% (Fig. 2B, 2C, and 2D).

A multidisciplinary team discussed the case. The patient was classified as having a localized, potentially curable stage of disease. He subsequently received 5 cycles of preoperative chemotherapy consisting of cisplatin 75 mg/m² in D1 and etoposide 100 mg/m² for 3 days, administered every 21 days. Clinical evaluation after 3 cycles showed a significant response, with the tumor size reduced to approximately 0.5 cm. Mild alopecia, nausea, and bone marrow suppression (which resolved with granulocyte-colony stimulating factor) were observed during treatment. The treatment was well tolerated by the patient with no other side effects noted.

A modified radical mastectomy with axillary lymph node dissection was subsequently performed. A histological examination revealed a complete pathological response with

17 reactive axillary lymph nodes showing extensive fatty necrosis. In the multidisciplinary team's assessment, neither postoperative breast irradiation nor prophylactic cranial irradiation was recommended. Therefore, the patient was placed under surveillance. A post-treatment CT scan demonstrated no evidence of recurrence, and the patient remains disease-free after 18 months of follow-up (Fig. 3). The timeline of the case is illustrated in Fig. 4.

3. Discussion

Breast neuroendocrine carcinoma (small-cell carcinoma) is a poorly differentiated neuroendocrine tumor, most commonly observed in women in their sixth to seventh decade. It is rare in men.[10] The majority of small-cell carcinomas arise in the lungs, with only 2–5% occurring at extrapulmonary sites [11]. It is rare in the breast, accounting for 0.4% of primary breast tumors in women according to the SEER database in 2012, and less than 0.1% in men [12]. A few cases have reported NEBC in male patients, with ages ranging from 52 to 83 years. Expression of neuroendocrine markers was variable (Chromogranin A, synaptophysin, CD56), while ER/PR were often positive, and HER2 was mostly negative. Most cases were diagnosed at an early stage, though some presented with metastatic disease. Outcomes were diverse and closely related to tumor stage and treatment. The best results were generally observed with surgery combined with systemic therapy (commonly platinum/etoposide regimens). Radiotherapy and endocrine therapy were also employed in selected cases. An important difference in our case is that treatment was aimed at a cure despite a poor prognosis. Table 1 summarizes these reported cases.[13], [14], [15], [16], [17], [18], [19], [20], [21] It is widely believed that small-cell carcinoma arises from the divergent differentiation of a neoplastic stem cell in both epithelial and neuroendocrine cells. An alternative theory suggests these tumors originate either from neural crest cells that migrate to the mammary glands or from pre-existing neuroendocrine cells within breast tissue.[22]

WHO guidelines define NEBC based on specific criteria. Firstly, neuroendocrine neoplasms are defined as tumor classes characterized by predominant neuroendocrine differentiation, including both well and scarcely differentiated tumors. Invasive neuroendocrine tumors demonstrate low/intermediate grade with a neuroendocrine morphology and immunoreactivity for neuroendocrine markers such as chromogranin A and synaptophysin. Due to their normal presence in breast tissue, neuron-specific enolase (NSE) and CD56 appear to result in lower sensitivity and specificity.[23], [24] Tumor stage and histological grade, including mitotic counts, are the main prognostic factors. Secondly, exclusion of primary extra-mammary tumors, especially those in the lungs and gastrointestinal tract.[22], [25] In our case, immunohistochemistry demonstrated synaptophysin positivity, supporting a neuroendocrine origin consistent with neuroendocrine carcinoma (small-cell carcinoma). Further staining was not undertaken owing to financial limitations. According to Wang et al., estrogen receptor status in NEBC may not provide prognostic value, as these tumors frequently show hormone receptor positivity yet continue to demonstrate poorer survival outcomes despite systemic therapy. This observation suggests that NEBC could be less responsive to current endocrine treatments than invasive ductal carcinomas, underscoring the need for further investigation in this area.

Because small cell carcinoma in the breast is rare, it remains unclear whether it should be treated according to breast cancer protocols or neuroendocrine tumors guidelines. Clinical management of this rare tumor type is challenging due to a lack of clinical trials to guide treatment decisions.[23] As there is no treatment guideline, neoadjuvant chemotherapy is often administered to reduce tumor size. In most cases, radiotherapy or chemotherapy is used after radical modified mastectomy with axillary lymph node dissection.[24], [26]

One study suggested that patients with a high Ki-67 index or small-cell carcinoma may benefit from the combination of etoposide and platinum, while anthracyclines or taxanes

may be more appropriate for patients with a low Ki-67 index.[26] It is currently unknown how effective such an approach would be. There is no statistically significant difference in overall survival between patients receiving single-agent adjuvant therapy and those receiving combination regimens.[27] The role of radiotherapy remains controversial in the treatment of NEBC. While some studies have reported survival benefits in patients with extrapulmonary small-cell carcinoma, including small-cell breast carcinoma,[28] other studies have found that adjuvant radiation did not significantly improve overall survival.[11], [29] As in our case, a complete response was achieved; therefore, radiotherapy was not administered.

This report has some limitations. In well-differentiated neuroendocrine carcinomas, scintigraphy or positron emission tomography (PET)-CT with gallium-labeled somatostatin analogs 68 may also be used to differentiate the tumors from multiple primitive sites. PET-CT with 18-fluorodeoxyglucose could be used in the same manner in neuroendocrine carcinomas that are poorly differentiated and show high proliferation rates.[30] A PET-CT scan was not performed in this case. Another limitation is the absence of genetic testing, as the genetic risk factors associated with NEBC remain poorly understood. Several genetic aberrations, such as *TP53*, *BRCA1/2*, and others, have been proposed as possible risk factors.[31] Genetic testing in the patient's case was not conducted. PET-CT scan and genetic testing are not available in the public hospitals and are not covered by insurance in Syria.

4. Conclusion

Primary NEBC (especially small-cell carcinomas subtypes) is a rare and distinct entity that has a worse prognosis than other breast cancers. We present a rare case of small-cell neuroendocrine breast cancer in a male patient who was treated successfully with neoadjuvant chemotherapy similar to small-cell lung cancer protocols followed by surgery in accordance with breast cancer standards. However, optimal treatment

strategies remain undefined and require a better understanding of the disease's pathophysiology.

Abbreviations

CT computerized tomography

NEBC neuroendocrine breast cancer

PET positron emission tomography.

Declarations

Ethics approval and consent to participate

Ethical approval was waived by the Board of Faculty of Medicine at Damascus University for this type of articles "case report".

Consent for publication

Written informed consent was obtained from the patient for publication of this case report and accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of the journal.

Competing interests

The authors declare that they have no competing interests.

Availability of data and materials

All data generated or analyzed during this study are included in this published article.

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The authors received no specific funding for this study.

Authors' contributions

All authors had full access to all data in the study and took responsibility for the integrity of the data. RH, EA, and MASY were involved in data extraction. All the

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References

- [1] F. Bray et al., “Global cancer statistics 2022: GLOBOCAN estimates of incidence and mortality worldwide for 36 cancers in 185 countries,” *CA Cancer J Clin*, vol. 74, no. 3, pp. 229–263, May 2024, doi: <https://doi.org/10.3322/caac.21834>.
- [2] M. Muhammad, M. Alali, and M. Saifo, “Clinicopathological features, treatment patterns, and survival outcomes among Syrian patients with advanced breast cancer,” *Front Oncol*, vol. 14, 2024, [Online]. Available: <https://www.frontiersin.org/journals/oncology/articles/10.3389/fonc.2024.1417053>
- [3] N. Liu, K. J. Johnson, and C. X. Ma, “Male Breast Cancer: An Updated Surveillance, Epidemiology, and End Results Data Analysis,” *Clin Breast Cancer*, vol. 18, no. 5, pp. e997–e1002, Oct. 2018, doi: 10.1016/j.clbc.2018.06.013.
- [4] A. Chau, N. Jafarian, and M. Rosa, “Male Breast: Clinical and Imaging Evaluations of Benign and Malignant Entities with Histologic Correlation,” *Am J Med*, vol. 129, no. 8, pp. 776–791, Aug. 2016, doi: 10.1016/j.amjmed.2016.01.009.
- [5] P. P. W. Yen, N. Sinha, P. J. Barnes, R. Butt, and S. Iles, “Benign and Malignant Male Breast Diseases: Radiologic and Pathologic Correlation,” *Canadian Association of Radiologists Journal*, vol. 66, no. 3, pp. 198–207, Aug. 2015, doi: 10.1016/j.carj.2015.01.002.

- [6] N. S. Salemis, “Primary neuroendocrine carcinoma of the breast: A rare presentation and review of the literature,” *Intractable Rare Dis Res*, vol. 9, no. 4, pp. 233–246, 2020, doi: 10.5582/irdr.2020.03046.
- [7] N. Roininen et al., “Primary neuroendocrine breast carcinomas are associated with poor local control despite favourable biological profile: a retrospective clinical study,” *BMC Cancer*, vol. 17, no. 1, p. 72, 2017, doi: 10.1186/s12885-017-3056-4.
- [8] F. Pareja and T. M. D’Alfonso, “Neuroendocrine neoplasms of the breast: A review focused on the updated World Health Organization (WHO) 5th Edition morphologic classification,” *Breast J*, vol. 26, no. 6, pp. 1160–1167, Jun. 2020, doi: <https://doi.org/10.1111/tbj.13863>.
- [9] M. Lavigne et al., “Comprehensive clinical and molecular analyses of neuroendocrine carcinomas of the breast,” *Modern Pathology*, vol. 31, no. 1, pp. 68–82, 2018, doi: <https://doi.org/10.1038/modpathol.2017.107>.
- [10] L. Atchison, T. Hardy, T. Mancl, B. P. Quaranta, and A. Madan, “Locally Advanced Primary Small Cell Carcinoma of the Breast: A Case Report and Review of Current Evidence,” *Case Rep Oncol*, vol. 14, no. 2, pp. 761–766, Jun. 2021, doi: 10.1159/000515505.
- [11] F. Hare, S. Giri, J. K. Patel, A. Hahn, and M. G. Martin, “A population-based analysis of outcomes for small cell carcinoma of the breast by tumor stage and the use of radiation therapy,” *Springerplus*, vol. 4, no. 1, p. 138, 2015, doi: 10.1186/s40064-015-0913-y.
- [12] J. Wang, B. Wei, C. T. Albarracin, J. Hu, S. C. Abraham, and Y. Wu, “Invasive neuroendocrine carcinoma of the breast: a population-based study from the surveillance, epidemiology and end results (SEER) database,” *BMC Cancer*, vol. 14, no. 1, p. 147, 2014, doi: 10.1186/1471-2407-14-147.

- [13] M. Papotti, F. Tanda, G. Bussolati, F. Pugno, L. Bosincu, and G. Massareli, "Intriguing Case: Argyrophilic Neuroendocrine Carcinoma of the Male Breast," *Ultrastruct Pathol*, vol. 17, no. 1, pp. 115–120, Jan. 1993, doi: 10.3109/01913129309015404.
- [14] J. Jiang, G. Wang, C. G. Liu, L. Lv, X. Liang, and H. D. Zhao, "Primary small-cell neuroendocrine carcinoma of the male breast: a rare case report with review of the literature," *Onco Targets Ther*, p. 663, May 2014, doi: 10.2147/OTT.S60782.
- [15] N. S. Al Tamimi, Y. Bennouna, M. El Fadli, and R. Belbaraka, "Metastatic Small Cell Carcinoma of a Male Breast: A Case Report and Review of the Literature.," *Gulf J Oncolog*, vol. 1, no. 42, pp. 74–78, May 2023.
- [16] M. Sharma, "Primary Neuroendocrine Carcinoma of the Male Breast: a Rare Case Report," *JOJ Nursing & Health Care*, vol. 5, no. 3, Nov. 2017, doi: 10.19080/JOJNHC.2017.05.555661.
- [17] G. Jundt, A. Schulz, Ph. U. Heitz, and M. Osborn, "Small cell neuroendocrine (oat cell) carcinoma of the male breast," *Virchows Arch A Pathol Anat Histopathol*, vol. 404, no. 2, pp. 213–221, 1984, doi: 10.1007/BF00704065.
- [18] P. Mecca and K. Busam, "Primary male neuroendocrine adenocarcinoma involving the nipple simulating Merkel cell carcinoma – a diagnostic pitfall," *J Cutan Pathol*, vol. 35, no. 2, pp. 207–211, Feb. 2008, doi: 10.1111/j.1600-0560.2007.00774.x.
- [19] K. Kimura et al., "Breast neuroendocrine tumor arising in the axilla of a man: a case report," *J Med Case Rep*, vol. 16, no. 1, p. 467, Dec. 2022, doi: 10.1186/s13256-022-03683-2.

- [20] F. Safini et al., "Carcinome neuroendocrine à grandes cellules primitif du sein: une tumeur rare chez l'homme," *Pan African Medical Journal*, vol. 25, 2016, doi: 10.11604/pamj.2016.25.205.10366.
- [21] L. Matt, T. Limjoco, and R. Sehgal, "A Case of Small Cell Cancer of the Breast in a Male with Synchronous Stage IV Non-Small Cell Lung Carcinoma," *Rare Tumors*, vol. 5, no. 3, pp. 169–171, Jul. 2013, doi: 10.4081/rt.2013.e52.
- [22] A. Irelli, M. M. Sirufo, L. Morelli, C. D'Ugo, L. Ginaldi, and M. De Martinis, "Neuroendocrine Cancer of the Breast: A Rare Entity," *J Clin Med*, vol. 9, no. 5, p. 1452, May 2020, doi: 10.3390/jcm9051452.
- [23] I. Abou Dalle, J. Abbas, F. Boulos, Z. Salem, and H. I. Assi, "Primary small cell carcinoma of the breast: a case report," *J Med Case Rep*, vol. 11, no. 1, p. 290, 2017, doi: 10.1186/s13256-017-1467-0.
- [24] J. Jiang, G. Wang, C. G. Liu, L. Lv, X. Liang, and H. D. Zhao, "Primary small-cell neuroendocrine carcinoma of the male breast: a rare case report with review of the literature," *Onco Targets Ther*, p. 663, May 2014, doi: 10.2147/OTT.S60782.
- [25] G. Rindi et al., "A common classification framework for neuroendocrine neoplasms: an International Agency for Research on Cancer (IARC) and World Health Organization (WHO) expert consensus proposal," *Modern Pathology*, vol. 31, no. 12, pp. 1770–1786, 2018, doi: 10.1038/s41379-018-0110-y.
- [26] Z. Tian et al., "Prognostic significance of tumor grading and staging in mammary carcinomas with neuroendocrine differentiation," *Hum Pathol*, vol. 42, no. 8, pp. 1169–1177, 2011, doi: <https://doi.org/10.1016/j.humpath.2010.11.014>.

- [27] Y. Yildirim, S. Elagoz, A. Koyuncu, C. Aydin, and K. Karadayi, "Management of neuroendocrine carcinomas of the breast: A rare entity.," *Oncol Lett*, vol. 2, no. 5, pp. 887–890, Sep. 2011, doi: 10.3892/ol.2011.320.
- [28] R. A. Grossman, F. E. Pedroso, M. M. Byrne, L. G. Koniaris, and S. Misra, "Does surgery or radiation therapy impact survival for patients with extrapulmonary small cell cancers?," *J Surg Oncol*, vol. 104, no. 6, pp. 604–612, Nov. 2011, doi: <https://doi.org/10.1002/jso.21976>.
- [29] N. Z. Abbasi et al., "Solid neuroendocrine carcinoma of the breast.," *J Coll Physicians Surg Pak*, vol. 23, no. 10, pp. 820–2, Nov. 2013.
- [30] E. Arslan, T. F. Çermik, F. Didem Can Trabulus, E. Canan Kelten Talu, and Ş. Başaran, "Impacto diagnóstico de la PET/TC con 18F-FDG en el tratamiento de carcinomas de mama raros: carcinomas apocrinos y neuroendocrinos," *Rev Esp Med Nucl Imagen Mol*, vol. 38, no. 3, pp. 147–153, 2019, doi: <https://doi.org/10.1016/j.rem.2018.11.007>.
- [31] A. J. Abdelwahab Yousef, "Male Breast Cancer: Epidemiology and Risk Factors," *Semin Oncol*, vol. 44, no. 4, pp. 267–272, 2017, doi: <https://doi.org/10.1053/j.seminoncol.2017.11.002>.

Fig. 1. Computerized tomography: A well-defined, regularly bordered nodule in the upper outer quadrant of the left breast, located entirely beneath the skin surface within the adipose tissue and does not reach the muscular layer.

Fig. 2. A: Breast neuroendocrine carcinoma (small-cell carcinoma) H&E, tumoral proliferation formed by uniform small cells with round nuclei showing dispersed chromatin, inconspicuous nuclei and thin cytoplasm. **B:** Immunohistochemical staining: positivity for synaptophysin, Cytoplasmic staining. **C:** Immunohistochemical staining: Positive Ki-67>70% (x40), nuclear staining. **D:** weakly positive CK.

Fig. 3. Post-treatment computed tomography scan showing no evidence of disease recurrence.

Fig. 4. The timeline for neuroendocrine carcinoma (small-cell carcinoma) of breast in a male patient. ALND: axillary lymph node dissection, MRM: modified radical mastectomy.

Table 1. Reported cases of male breast neuroendocrine carcinoma

Year/A uthor	Age (years)	Stage	Management at diagnosis	N S E	Cg A/B	CD 56	Syn	E R	PR	HE R-2	Outcome	Notes
This case	47	T1N0 M0	Neoadjuvant cisplatin and etoposide then MRM+ALND	N S	NS	NS	+	N S	NS	Ne gati ve	After 18 months of follow- up: disease- free	CK: weakly positive, Ki- 67>70%
1993 Papotti (13)	83	T1N0 M0	Simple mastectomy	+	+	NS	+	N eg at iv e	NS	NS	After a disease- free interval of 7 years, the patient died of an	

											unrelated cause	
Jiang J 2014 (14)	79	T1N1 M0	Simple radical mastectomy and level I lymphadenectomy then follow-up	NS	+	+	+	Negative	+	+	Recurrence after 20 months	
Al Tamimi NS 2023 (15)	62	T2Nx M1	Cisplatin and Etoposide	NS	+	+	+	negative	Negative	negative	Died after 9 months	Negative for TTF-1 and GATA3 .Ki-67, 85%.
Sharma M 2017 (16)	55	T1N1 M0	MRM+ALND then adjuvant chemotherapy and radiotherapy	NS	+	NS	NS	+	Negative	+	Free of disease	
Jundt G 1984 (17)	52	TxN+ M1	Irradiation and chemotherapy	+	NS	NS	NS	NS	NS	NS	Death 14 months after the diagnosis.	
Mecca P 2008 (18)	70	T4N1 M0	Mastectomy and SLNB	+	NS	+	+	+	+	+	Approximately 1 year after diagnosis, no evidence of disease.	Simulating skin Merkel cell
Kimura K 2022 (19)	64	T1N1 M0	Wide radical excision of the axillary tumor and axillary lymph node dissection then chemotherapy (docetaxel and cyclophosphamide), endocrine therapy (tamoxifen) and radiotherapy	NS	NS	NS	+	+	+	Negative	After 1 year, no evidence of disease.	
Safini F 2016 (20)	61	T4bN 1M1	Chemotherapy (docetaxel),	NS	+	NS	+	+	+	Negative	After 18 years, good	

			followed by endocrine therapy (tamoxifen)								clinical and radiolog ical response	
Matt L 2013 (21)	61	T2N0 M0	Radiation therapy (RT) to the right breast concurrently with chemotherap y using carboplatin and etoposide	N S	NS	+	+	N S	NS	NS	After Comple ted, The breast mass has disappea red.	Simulta neous diagnosi s of Stage IV NSCLC of the lung; p63 - moderat ely positive, nuclear, diffuse, CK5/6 - negative and TTF-1 - negative

CgA: chromogranin A, ER: estrogen receptor, HER-2: human epidermal growth factor receptor-2, NS: not specified, NSCLC: non-small cell lung cancer, NSE: neuron specific enolase, PR: progesterone receptor, SLNB: sentinel lymph node biopsy, Syn: synaptophysin, +: positive.