Small cell breast carcinoma. Case report

Leszczyńska P.[*1 A-D], Sobocińska M. [1 A-D], Ustymowicz K. [2 A-D], Romańczyk W. [3 E-F]

1. Department of General Pathomorphology, Medical University of Bialystok, Poland
2. Medical University of Warsaw, Poland

A- Conception and study design; **B -** Collection of data; **C -** Data analysis; **D -** Writing the paper;
E- Review article; **F -** Approval of the final version of the article; **G -** Other (please specify)

ABSTRACT

Introduction: Primary small cell breast carcinoma is a highly malignant, uncommon cancer, which accounts for less than 1% of all breast cancers. It is usually found in women over 60 years of age as a palpable tumour of the breast or armpit. Due to the small number of relevant case reports, this type of cancer presents a diagnostic and therapeutic challenge.

Case presentation: A 85-year-old woman showed up at the Oncology Clinic with a palpable node in the left breast. On physical examination, the patient was in general good condition, ECOG performance status of 1. In deviations from the norm, there was a palpable tumour with a diameter of ca. 4cm in the lower outer quadrant, 4 o'clock position of the left breast; and an enlarged, movable left axillary lymph node, with a diameter of about 3 cm. The diagnosis, strongly influenced by the abovementioned tests, was small cell breast cancer TNBC-cT2N1M0. As agreed at the case conference meeting, the patient was qualified for neoadjuvant chemotherapy according to the 4-EP scheme, followed by mastectomy with lymphadenectomy of the left armpit and complementary radiotherapy. The patient received four courses of chemotherapy from 28 March to 30 May 2023. The visible tumour regression in physical examination revealed good treatment tolerance – a reduction of tumour size on palpation by half. The patient is undergoing follow-up checks after chemotherapy and awaits a scheduled surgery.

Conclusions: Literature on primary small cell breast carcinoma is still limited . Diagnostics of SCNCB include positron emission tomography (PET) and CT scans to rule out metastases from another primary location. Clinical treatment of SCNCB is still underdeveloped. A particularly important prognostic factor is the size of tumour at the time of treatment. Early detection and interdisciplinary therapies may be relevant for improving prognosis. Research on the diagnosis, treatment and prognosis of SCNCB is still ongoing.

Keywords: small cell breast carcinoma, SCNCB, SCLC

DOI:

***Corresponding author**
Paula Leszczyńska
Department of General Patomorphology
Medical University of Bialystok
e-mail: paula.lesz@wp.pl

Received: 20.05.2023
Accepted: 20.06.2023
Progress in Health Sciences
Vol. 13(1) 2023 pp 110-113

INTRODUCTION

Primary small cell breast carcinoma is a highly malignant, uncommon cancer, which accounts for less than 1% of all breast cancers [1,2,3,4]. It is usually found in women over 60 years of age as a palpable tumour of the breast or armpit [1]. Also known as small cell neuroendocrine cancer of the breast (SCNCB) in the WHO classification, it resembles morphologically and immunohistochemically small cell carcinoma of the lung (SCLC) [5,6]. It is typically associated with aggressive course and poor diagnosis. Due to the small number of relevant case reports, this type of cancer presents a diagnostic and therapeutic challenge.

CASE REPORT

A 85-year-old woman showed up at the Oncology Clinic with a palpable node in the left breast. She had no family history of malignancy, was non-smoking, and had co-existing conditions such as hypertension and type 2 diabetes treated with insulin.

On physical examination, the patient was in general good condition, ECOG performance status of 1. In deviations from the norm, there was a palpable tumour with a diameter of ca. 4cm in the lower outer quadrant, 4 o'clock position of the left breast; and an enlarged, movable left axillary lymph node, with a diameter of about 3 cm. Other peripheral lymph nodes were in order and not enlarged.

Breast ultrasound and mammography revealed a sizeable (23x30x36mm) heterogeneous focal lesion with microcalcifications in the left breast in the 6 o'clock position – BIRADS 5.

An ultrasound-guided core biopsy indicated a small cell carcinoma and a Ki-67 proliferation index of 100%. Immunohistochemically, the tumour was negative for estrogen receptor (ER), progesterone receptor (PR), and human epidermal growth factor receptor 2 (HER2). Furthermore, the tumour cells were positive for synaptophysin and thyroid transcription factor-1 (TTF1). Fig.1-4.

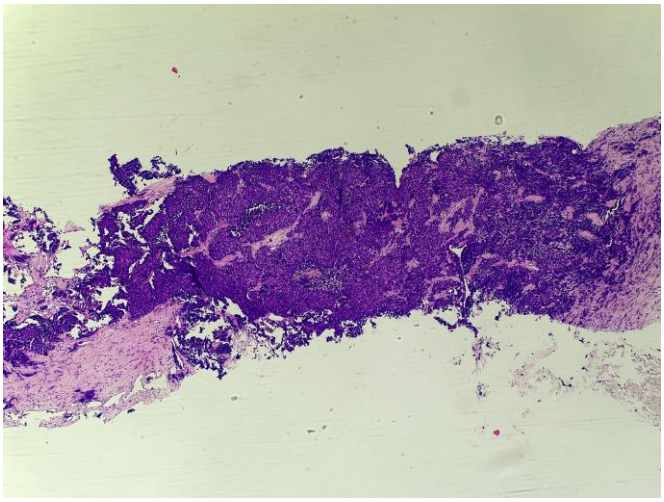

Figure 1. Small -cell-breast carcinoma H&E (x40)

Figure 2. Immunohistochemical expression of Synaptophysin (x40)

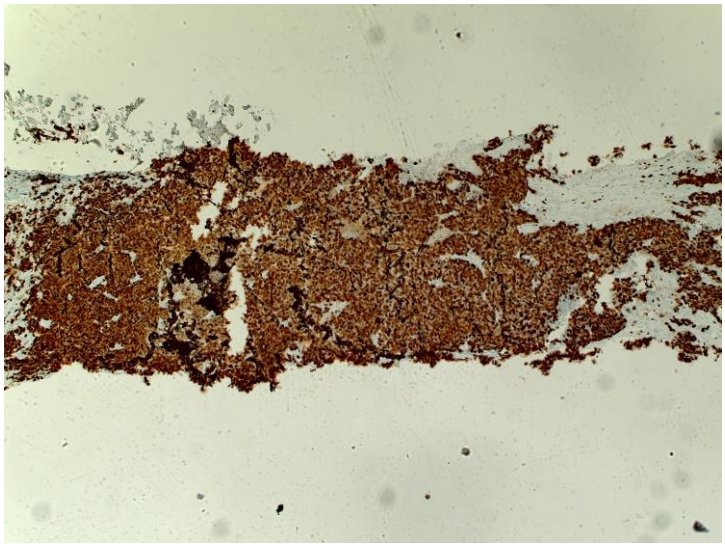

Figure 3. Immunohistochemical expression of TTF-1 (x40)

Figure 4. Immunohistochemical expression of Ki67- 100% (x40)

A CT scan of the chest, abdomen, and pelvis showed in the upper quadrants of the left breast 32x35x29mm single reinforced axillary lymph node of the left armpit, 9mm in the short axis – suspected of metastasis sentinel lymph node. Furthermore, a chest, abdomen, and pelvis CT scan found no lesions indicating metastasis.

A diagnostics extended to PET, which showed a 36x27x26mm focal lesion in the left breast in the lower inner quadrant and a 16x11x11mm lesion in the left axillary lymph node with the character of an active proliferative process. No other changes suspected of proliferative nature with increased glucose metabolism were found.

The diagnosis, strongly influenced by the abovementioned tests, was small cell breast cancer TNBC-cT2N1M0. As agreed at the case conference meeting, the patient was qualified for neoadjuvant chemotherapy according to the 4-EP scheme, followed by mastectomy with lymphadenectomy of the left armpit and complementary radiotherapy. The patient received four courses of chemotherapy from 28 March to 30 May 2023. It is worth noting that the dosing of cytostatics was reduced by 25% due to the patient's age and co-existing conditions. The visible tumour regression in physical examination revealed good treatment tolerance – a reduction of tumour size on palpation by half. The patient is undergoing follow-up checks after chemotherapy and awaits a scheduled surgery.

DISCUSSION

Literature on primary small cell breast carcinoma is still limited [2]. Diagnostics of SCNCB include positron emission tomography (PET) and CT scans to rule out metastases from another primary location [7]. Also, in most SCNCB patients there is immunohistochemical staining against neuroendocrine markers, in particular chromo-granin and synaptophysin. This is an auxiliary test,

as their expression is not necessary for diagnosis [1,8]. Clinical treatment of SCNCB is still underdeveloped. No treatment guidelines exist for this rare disease. Clinical management is largely based on the therapeutic strategies of SCLC, in part due to their similar histological and morphological characteristics. It combines surgery, chemotherapy, and radiotherapy - depending on the size of the tumour and the lymph node status [1,8,9]. Most adjunctive chemotherapy regimens include cisplatin and etoposide - common therapies for SCLC. However, combinations containing anthracyclines and/or taxanes commonly used in other types of breast cancer have also been described in the literature [6,8,10,11]. Choice of complementary systemic therapy for SCNCB should take account of both the biological characteristics of the disease and the risk of recurrence [10]. A particularly important prognostic factor is the size of tumour at the time of treatment. Early detection and interdisciplinary therapies may be relevant for improving prognosis. It has been shown that prognosis in patients with SCNCB may be better than previously suggested [12,13]. Research on the diagnosis, treatment and prognosis of SCNCB is still ongoing.

ORCID

Leszczyńska Paula
https://orcid.org/0009-0006-5103-2936
Sobocińska Maria
https://orcid.org/0009-0003-0033-4596
Ustymowicz Konstancja
https://orcid.org/0000-0001-8678-320X
Wiktoria Romańczyk
https://orcid.org/0000-0002-5550-3452

Conflicts of interest

The authors have declared no conflict of interest

Funding

No funding source was used in the present study

REFERENCES

1. Tremelling A, Samuel S, Murray M. Primary small cell neuroendocrine carcinoma of the breast - A case report and review of the literature. Int J Surg Case Rep. 2017;38:29-31.
2. Atchison L, Hardy T, Mancl T, Quaranta BP, Madan A. Locally Advanced Primary Small Cell Carcinoma of the Breast: A Case Report and Review of Current Evidence. Case Rep Oncol. 2021 Jun 4;14(2):761-766.
3. Zhu J, Wu G, Zhao Y, Yang B, Chen Q, Jiang J, Meng Y, Ji S, Gu K. Epidemiology, Treatment and Prognosis Analysis of Small Cell Breast Carcinoma: A Population-Based Study. Front Endocrinol. (Lausanne) 2022 Apr 4;13:802339.
4. Steven Halls. Rare Breast Cancers: Neuro-Endocrine, Acinic and More - Moose and Doc, Breast Cancer - Moose and Doc, [Internet] 7 May 2019, Available from: https://breast-cancer.ca/5d-rare-types/.
5. Tan PH, Ellis I, Allison K, Brogi E, Fox SB, Lakhani S, Lazar AJ, Morris EA, Sahin A, Salgado R, Sapino A, Sasano H, Schnitt S, Sotiriou C, van Diest P, White VA, Lokuhetty D, Cree IA. WHO Classification of Tumours Editorial Board. The 2019 World Health Organization classification of tumours of the breast. Histopathology 2020 Aug;77(2):181-185.
6. Abou Dalle I, Abbas J, Boulos F, Salem Z, Assi HI. Primary small cell carcinoma of the breast: a case report. J Med Case Rep. 2017 Oct 19;11(1):290.
7. Trevisi E, La Salvia A, Daniele L, Brizzi MP, De Rosa G, Scagliotti GV, Di Maio M. Neuroendocrine breast carcinoma: a rare but challenging entity. Med Oncol. 2020 Jul 25;37(8):70.
8. Zhu J, Wu G, Zhao Y, Yang B, Chen Q, Jiang J, Meng Y, Ji S, Gu K. Epidemiology, Treatment and Prognosis Analysis of Small Cell Breast Carcinoma: A Population-Based Study. Front Endocrinol. (Lausanne) 2022 Apr 4;13:802339.
9. Boutrid H, Kassem M, Tozbikian G, Morgan E, White J, Shah M, Vandeusen J, Sardesai S, Williams N, Stover DG, Lustberg M, et al. TTF-1 Positive Primary Small Cell Carcinoma of the Breast: A Case Report and Review of the Literature. Front Endocrinol. (Lausanne) 2020 Apr 29;11:228.
10. Inno A, Bogina G, Turazza M, Bortesi L, Duranti S, Massocco A, Zamboni G, Carbognin G, Alongi F, Salgarello M, Gori S. Neuroendocrine Carcinoma of the Breast: Current Evidence and Future Perspectives. Oncologist. 2016 Jan;21(1):28-32.
11. Gallo M, Campione S, Di Vito V, Fortunati N, Lo Calzo F, Messina E, Ruggeri RM, Faggiano A, Colao AAL. Primary Neuroendocrine Neoplasms of the Breast: Still Open Issues. Front Endocrinol. (Lausanne) 2021 Jan 26;11:610230.
12. Shin SJ, DeLellis RA, Ying L, Rosen PP. Small cell carcinoma of the breast: a clinicopathologic and immunohistochemical study of nine patients. Am J Surg Pathol. 2000 Sep;24(9):1231-8.
13. Steven Halls. Small Cell Breast Cancer or Small Cell Breast Carcinoma - Moose and Doc, Breast Cancer - Moose and Doc, [Internet] 7 May 2019, Available from: https://breast-cancer.ca/smallcellys/.