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# Follicular Dendritic Cell Sarcoma: A Rare Case Study of Meta-Synchronous Double Primary Cancers Follicular Dendritic Sarcoma and Invasive Breast Cancer

**Emad Mohsen Barsoum[1], Sara El Sherif[2], May Gamal Ashour[2], Mohsen Samy Barsoum[1]**

[1]Barsoum Oncology Center (BOC), Giza, Egypt
[2]Radiation Oncology and Nuclear Medicine Department, National Cancer Institute, Cairo University, Cairo, Egypt
Email: may.ashour@nci.cu.edu.eg

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## Abstract

Follicular dendritic cell sarcomas (FDC-Sarcoma) are a rare type of tumor. Although most cases (60%) originate in the cervical, abdominal, or axillary lymph nodes, extranodal origin from secondary lymphatic tissue such as the tonsils, Waldeyer's ring, or MALT is also prevalent (40%). We report a case of cervical FDCS in a 51-year-old female who developed invasive breast cancer during follow-up. We review the presentation and management of this disorder, emphasizing the differential diagnosis. The patient was continuously monitored and has been free of recurrences for ten years. For FDC Sarcoma of the head and neck, this case suggests surgical resection combined with chemotherapy and radiotherapy as a therapeutic option.

## Keywords

Follicular Dendritic Sarcoma, FDCS, STS, Breast Cancer

## 1. Introduction

Follicular dendritic cell sarcoma (FDCS) is a rare disorder; the precise incidence is unknown. In the medical literature, just a few hundred cases have been described. FDCS constitutes <0.4 percent of soft tissue sarcomas [1]. In a pooled analysis that included 462 cases of FDCS, the median age was in the fifth decade, although cases have been reported in children [2]. Males and females are affected equally, but the inflammatory variant is more common in females [3].

Asymptomatic, slow-growing, painless cervical lymphadenopathy characte-

rizes the majority of patients. Extranodal locations, such as the skin, mediastinum, tonsil, gastrointestinal system, and soft tissue, account for one-third of FDCS cases [4]. The abdominal disease can cause stomach pain and systemic symptoms, including exhaustion, fever, and night sweats [5].

Follicular dendritic cell sarcoma is frequently misdiagnosed, with rates ranging from 30% to 58% of cases being misdiagnosed, primarily from extranodal locations [4]. Differential diagnoses of FDCS include interdigitating dendritic cell sarcoma, thymoma, spindle cell carcinoma, metastatic undifferentiated carcinomas, malignant melanoma, and gastrointestinal stromal tumor (GIST) [6].

Immunohistochemical tests are required to diagnose FDCS. Lesional cells often display markers of FDC origin, including CD21, CD23, CD35, CXCL13, clusterin, and desmoplakin vimentin fascin, epidermal growth factor receptor (EGFR), and HLA-DR, according to immunophenotyping. Follicular dendritic cell sarcoma has a wide range of EMA and other cytokeratin positivity. S-100 and CD68 immunoreactivity are variable, while B-cell marker CD20 and common leukocyte antigen CD45 positive is uncommon. Other hematopoietic markers, such as lysozyme, myeloperoxidase, CD34, CD3, CD79a, CD30, CD1a, and HMB-45, are negative. The Ki-67 proliferation fraction varies; however it is often less than 30% [7]-[13].

## 2. Case Report

In October 2011, a 51-year-old female presented with a painless enlarging right neck mass of a few years' duration, increasing in size over the last few months. She denied having any constitutional symptoms and only complained of dysphagia. She was presented to our center after an excisional biopsy of the right neck swelling measuring 55 × 35 mm with negative margins, which revealed follicular dendritic cell sarcoma confirmed by immunophenotyping positive to CD3 CD23, CD 35, and CD20. Post-excisional evaluation by CT neck with contrast showed right multiple posterior neck triangle lymph nodes, the most prominent measures 35 × 30 × 18 mm.

The patient received six cycles of CHOP ended in February 2012. Post-CHOP evaluation by CT neck with contrast showed a regressive course of the disease with the most prominent right posterior neck lymph node measuring 20 mm.

We advised adjuvant radiotherapy as involved field 40 Gy over 20 fractions, which ended in April 2012. The patient tolerated the entire course of treatment of chemotherapy and radiotherapy without toxicity.

Three months post-treatment, evaluation by CT neck with contrast showed further regressive course of right-sided neck nodes with the largest lymph node measuring 10 mm, and the patient was clinically free.

Six months post-treatment, evaluation by CT neck with contrast showed resolution of the disease, and the patient remained free clinically.

The patient was kept under follow-up with clinical and radiological evaluation, which were all free till September 2019, she was still free locally, but a left

breast mass was noticed during a clinical examination.

We asked for a mammogram, which showed a left breast suspicious lesion measuring 19 × 13 mm (BIRADS 5) with a suspicious ipsilateral axillary lymph node, and evaluation of the rest of the body was free.

We advised for an image-guided biopsy and assessment of the biological subtype, and the patient underwent upfront left CBS in September 2019. Pathology of the left breast lesion was of invasive duct carcinoma, GII type, removed with a negative margin, pT2N1, ER7/8, PR0/8, Her-2 neu score +3.

The patient received adjuvant chemotherapy, three cycles of Epirubicin and Cyclophosphamide, and 12 cycles of Taxol with three shots of Trastuzumab ended March 2020, followed by radiotherapy to the left breast and regional nodal stations ended May 2020, then started hormonal treatment (Letrozole). She continued Tratuzumab total of 17 shots that ended in January 2021.

The patient's last radiological and clinical evaluation regarding breast cancer and follicular cell sarcoma was done in October 2021, and she was free of disease.

We advised the continuation of hormonal treatment and to continue regular follow-up.

## 3. Discussion

There is currently no standardized or guideline-based treatment for FDCS due to its rarity. As a result, treatment techniques might vary considerably. The malignancy is treated differently depending on whether the tumor is stromal or lymphoid.

Comparable to sarcoma, FDCS is surgically treated. In unilocular FDCS, surgical excision has been adequate [14] [15] [16]. Amin *et al.* described a case of head and neck FDCS treated surgically. There was no neck dissection. After two years, their patient had no recurrence [17]. Surgery combined with adjuvant chemo- or radiation has been tried in patients with multilocular FDCS [18]. Pisani *et al.* [19] treated head and neck FDCS with surgical excision and five sessions of COP with (PEG)-liposomal doxorubicin as adjuvant chemotherapy. Nonetheless, adjuvant therapy had no meaningful influence on overall survival in patients with localized FDCs [20].

Other sarcoma-based regimens have been used successfully in FDCS, including gemcitabine plus Taxotere, Adriamycin, Ifosfamide, and mesna. FDCS has been successfully treated with gemcitabine in combination with a taxane (paclitaxel or docetaxel) in several case reports [21]. Gemcitabine and Taxotere combination therapy produced the best results in a trial of 46 patients with FDCS who received various chemotherapy drugs. There were 42 percent (5/12) complete responders, 41 percent (5/12) partial responders, and two non-responders among patients who received gemcitabine and Taxotere with/without other modalities. Six patients underwent surgery before chemotherapy, three had radiotherapy, and one had chemotherapy alone among the ten responders [21].

Additionally, case reports show that multitargeted kinase inhibitors, such as pazopanib and sorafenib, have efficacy against the vascular endothelial growth factor receptor (VEGFR). Despite the lack of data, the broad approval of pazopanib for advanced non-adipocytic soft tissue sarcomas includes FDCS. This agent is another option for treating patients with chemotherapy-refractory FDCs [22].

FDCS, on the other hand, is treated with chemotherapy using cyclophosphamide, doxorubicin, vincristine, and prednisone (CHOP) or CHOP-like regimens, similar to lymphoid cancers. Choi *et al.* described a case of FDCS treated with a CHOP regimen. After two cycles, there was a partial response [23]. Recurrence rates may be high as a result of inadequately developed regimens. In 2014, Roesch *et al.* proposed that aggressive chemotherapies cause immune cell depletion, allowing early tumor recurrence [24].

Our patient was treated with a multimodality option, including surgery, chemotherapy, and radiotherapy, with a good response and a ten-year follow-up free of recurrence.

## 4. Conclusion

We present a case with meta-synchronous double primary tumors, cervical follicular dendritic sarcoma, and invasive breast cancer treated with multimodality options including surgery, chemotherapy, and radiotherapy with a good response with a ten-year follow-up free of recurrence.

## Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper. Informed consent was obtained from the patient.

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