

## Case Report

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# Follicular Dendritic Cell Sarcoma of the Neck Recurring after Trimodality Therapy: A Rare and Aggressive Neoplasm

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## Abstract

Follicular dendritic cell sarcoma is one of the rare and aggressive neoplasms originating from follicular dendritic cells of lymphoid tissues. It commonly presents as asymptomatic lymphadenopathy, but extranodal involvement such as oral cavity, mediastinum, liver, and spleen are also reported. The disease often has an indolent course. Current knowledge on its pathogenesis is limited and due to its rarity, follicular dendritic cell sarcoma has no definite treatment strategy at present. Here we report a case of a 24-year old male with follicular dendritic cell sarcoma of neck, treated with wide local excision, post operative radiation and chemotherapy, and developing pulmonary metastasis after a disease-free period of 15 months.

**Keywords:** Follicular dendritic cell sarcoma, Head and neck, Recurrence, Radiation therapy

## Introduction

The purpose of follicular dendritic cells (FDC) that reside within primary and secondary B-cell follicles is to trap and present antigens to B-cell lymphocytes. Follicular dendritic cells can store antigens on the cell surface as immune complexes for extended periods of time.<sup>1</sup> They are a non-migrating population that forms a stable meshwork within the follicle via cell-to-cell attachments and

desmosomes.

Follicular dendritic cell sarcoma (FDSC) is a neoplastic proliferation of spindle to ovoid cells that show morphologic and immunophenotypic features of FDCs. Initially described by Monda et al. in 1986,<sup>2</sup> the name, FDSC, was first proposed by Chan et al. in 1997.<sup>3</sup>

The majority of cases are observed in lymph nodes with the cervical node, the most common site of involvement.<sup>4</sup> There have been less

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than one-third of cases reported as extranodal, which include the tonsils, oral cavity, gastrointestinal tract, soft tissues, skin, mediastinum, liver, and spleen.<sup>5,6</sup> The lungs, lymph nodes, and liver are the most common sites for FDCCS metastasis.<sup>7</sup>

Typically, FDCCS presents as a painless, slow-growing, well-circumscribed mass with no constitutional symptoms of fever, night sweats, fatigue, or weight loss.<sup>8</sup> Immunohistochemistry results indicate that FDCCS is immunopositive for one or more of the follicular dendritic markers – CD21, CD35, CD23 and negative for cytokeratins, CD31, CD34, and CD1a.<sup>9</sup> Surgery is the cornerstone of treatment, either with or without adjuvant chemotherapy or radiotherapy.

### Case report

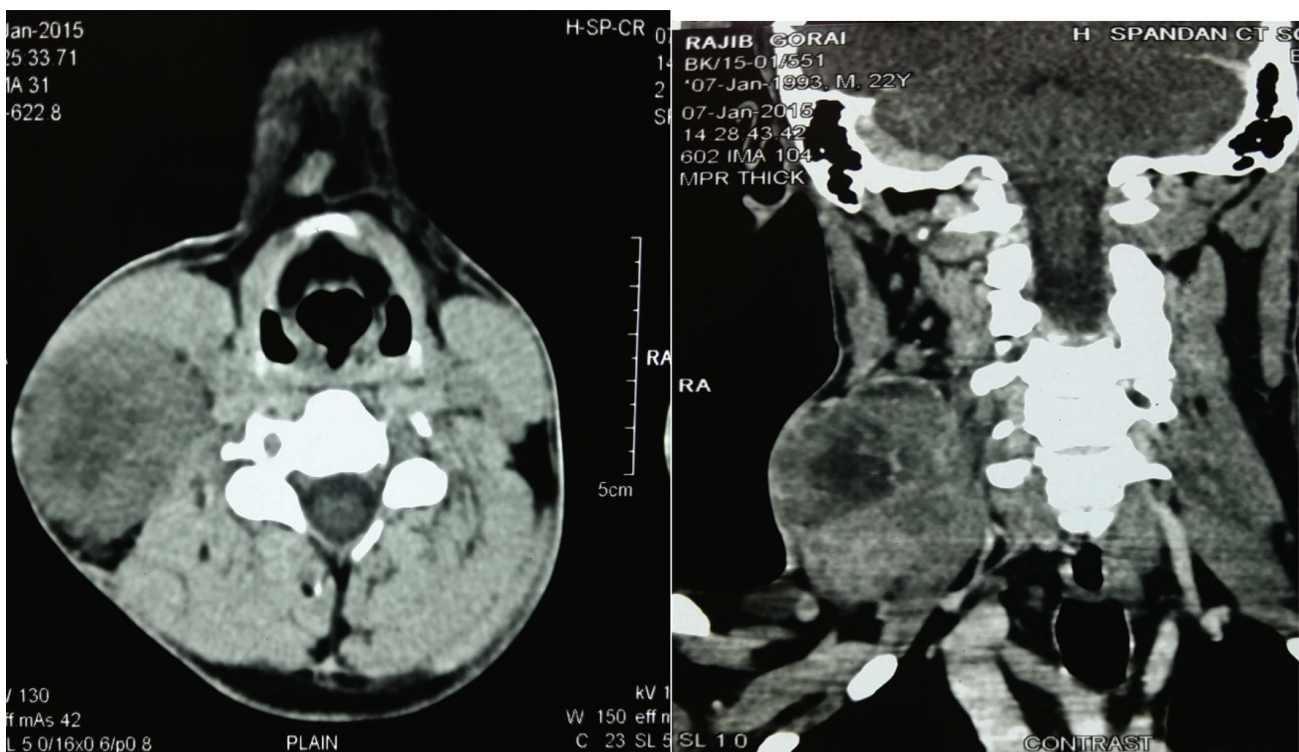
A 24-year-old man presented with a painless right-sided neck swelling which gradually increased in size over 2-3 years. He was otherwise asymptomatic. Physical examination revealed a firm, mobile, level IV lymph nodal swelling on the right side, measuring approximately 6×8 cm in diameter (Figure 1). Fine-needle aspiration cytology report of the neck mass revealed benign



**Figure 1.** Initial presentation.

fibrous histiocytoma. Computed tomography (CT) scan of the neck showed a lobulated inhomogeneously enhancing soft-tissue lesion (5.54×4.05 cm) in the right-sided level IV area with central amorphous tiny calcifications and necrosis (Figure 2).

Surgical excision of the neck mass was performed in February 2015. The histopathology sections showed spindle shaped cells arranged



**Figure 2.** CT of the neck showed a right-sided soft tissue mass.

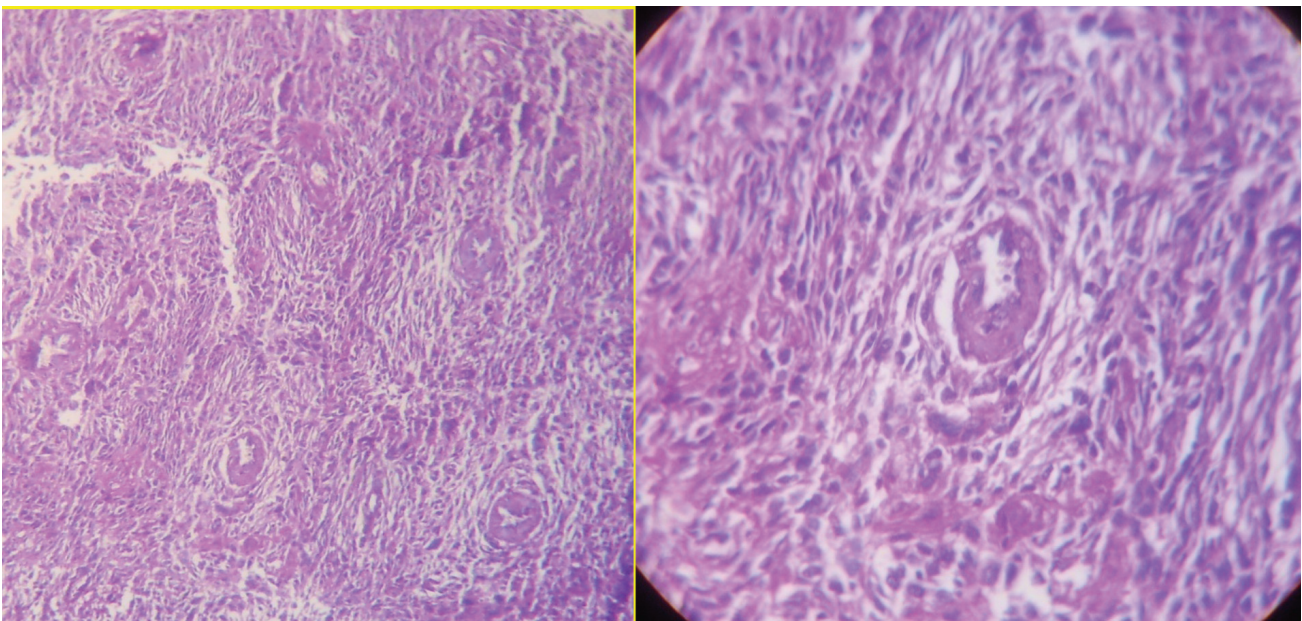
in fascicles, whorls and storiform patterns, with oval nuclei and vesicular chromatin (Figure 3), scattered small lymphocytic infiltration and focal perivascular cuffing, consistent with FDSC. Immunohistochemical study of the tissue block was positive for CD23, CD21, and CD35 which is typical of FDSC, and immunonegative for cytokeratin. The patient reported to the Radiotherapy Department of our institution in March 2015 for adjuvant chemotherapy and radiotherapy. The radiation regimen consisted of 54 Gy split into 27 fractions of 2 Gy to the right neck and supraclavicular region, which he completed in May 2015. After completion of radiotherapy, the patient underwent 6 cycles of chemotherapy that consisted of day 1 intravenous (i.v.) infusions of cyclophosphamide (800 mg/m<sup>2</sup>), doxorubicin (80 mg/m<sup>2</sup>), and vincristine (2 mg/m<sup>2</sup>), along with oral prednisolone (100mg) per day on days 1-5, as the CHOP regimen. The patient completed this regimen in December 2015. He was seen for follow-up visits at regular 3-month intervals and remained asymptomatic until February 2017. The patient complained of chest pain in the middle of March and consulted his local physician, who advised a chest radiograph. The physician suspected pulmonary tuberculosis

and the patient was prescribed anti-tubercular drugs (ATD) in April 2017.

In May 2017, the patient again presented to us with respiratory distress and chest pain. Contrast-enhanced CT scan of the thorax revealed bilateral hilar lymphadenopathy and extensive pulmonary nodules of varying sizes (Figure 4a-c). He was diagnosed with metastatic FDSC. The patient underwent salvage chemotherapy that consisted of gemcitabine(1.4 mg/m<sup>2</sup>, i.v., day 1), dexamethasone(60 mg/m<sup>2</sup>, p.o., in divided doses, days 1-4), cisplatin (80 mg/m<sup>2</sup>,i.v., day 1), followed by gemcitabine(1.4 mg/m<sup>2</sup>, i.v., day 8), as the GDP protocol. A CT scan of the thorax, after 3 cycles of GDP, showed partial response to the second-line chemotherapy (Figure 4d). Currently, the patient is on regular follow-up.

### Discussion

Follicular dendritic cell sarcoma is categorized as a low-to-intermediate grade malignant tumor that arises from FDC of the lymphoid follicles. The etiology and pathogenesis of FDSC is unclear. While most FDSC arise from lymph nodes, at least one-third occur in extranodal sites. According to histopathologic analysis, the neoplasm comprises spindle to ovoid cells that form fascicles,



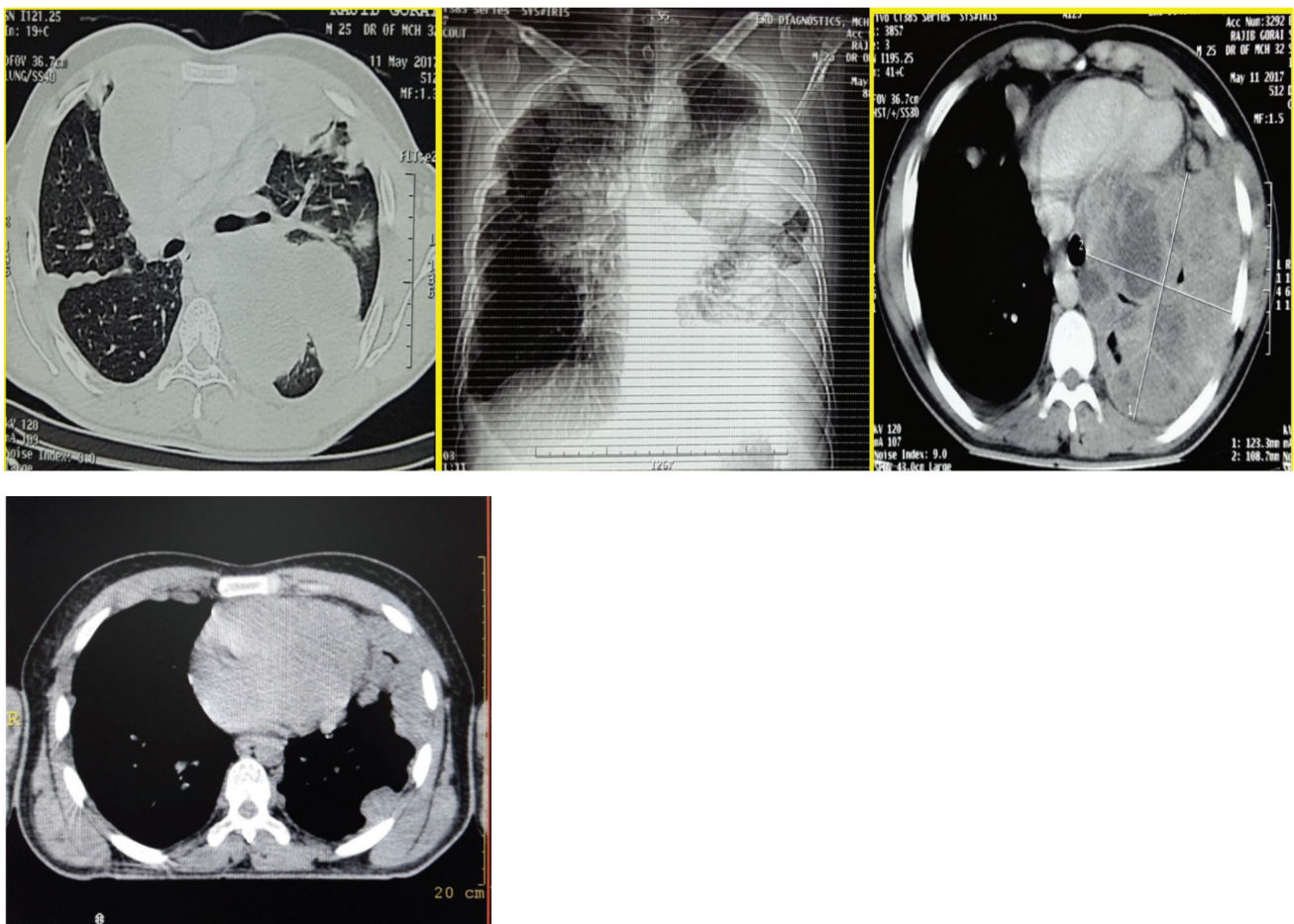
**Figure 3.** Histopathology section showing oval to spindle shaped cells arranged in fascicles, whorls and storiform patterns (Hematoxylin-eosin staining, 10 $\times$  and 40 $\times$ ).

storiform arrays, whorls, diffuse sheets, or vague nodules with admixed small lymphocytes. Diagnosis of FDCS is challenging and approximately 50% of cases are misdiagnosed as undifferentiated carcinomas.<sup>10</sup> A broad differential diagnosis can be developed as this tumor has morphologic features similar to other tumors such as interdigitating dendritic cell sarcoma, thymoma, spindle cell carcinoma, metastatic undifferentiated carcinomas, malignant melanoma, and gastrointestinal stromal tumor (GIST). However, the immunophenotypic profile of FDCS is quite specific and crucial for diagnosis. Traditional diagnostic markers for FDCS include CD21, CD23, and CD35.

Although surgical resection is the mainstay of treatment for local disease, the recurrence rate can be as high as 50%.<sup>11</sup> Chemotherapy and

radiation are often used as adjunctive treatments with limited evidence to guide these decisions. Previous literature has concluded that patients with localized disease have significantly better overall survival compared to patients with distant disease. Young age, absence of lymphoplasmacytic response, and tumor size >6 cm have a significant association with poor prognosis.

In this case, a 24-year-old adult male presented with painless cervical lymph nodal swelling. Immunohistochemical markers were positive for CD21, CD35, and CD23, which depicted a typical picture of FDCS. He underwent surgical resection of the mass and had a moderate tumor control of 15 months following a course of radiation and chemotherapy. However, due to its aggressive nature, the disease relapsed with extensive pulmonary metastasis after this disease-free interval.



**Figure 4.** (a-c): Computed tomography (CT) images show bilateral hilar lymphadenopathy and extensive pulmonary nodules. (d). Partial response after 3 cycles of gemcitabine (1.4 mg/m<sup>2</sup>, i.v., day 1), dexamethasone (60 mg/m<sup>2</sup>, p.o., in divided doses, days 1-4), cisplatin (80 mg/m<sup>2</sup>, i.v., day 1), and gemcitabine (1.4 mg/m<sup>2</sup>, day 8), as the GDP chemotherapy regimen.

In FDSC cases, surgery is considered the cornerstone of treatment with or without adjuvant chemotherapy or radiotherapy. A literature review suggests that among head and neck FDSC follicular dendritic sarcoma, those that arise predominantly from cervical lymph nodes have the highest chances of locoregional recurrence (43%). The best locoregional control is achieved in those who receive adjuvant radiation and chemotherapy. Several chemotherapy regimens such as the CHOP regimen; ifosfamide, carboplatin and etoposide (ICE) regimen; and the adriamycin, bleomycin, vincristine and dacarbazine (AVBD) regimen have been administered to patients with FDSC. However, there is no consensus on the most effective regimen. Lymphoma-type chemotherapy remains the mainstay of treatment for disseminated FDSC.<sup>8</sup> There is a recent trend towards treating this unique tumor along the lines of treatment for sarcomas. However, there is very limited data on second-line chemotherapy in case of relapse or recurrence. Although response is observed with multiple lines of chemotherapy, recurrence is frequent.<sup>12</sup> Reports of excellent response to various other sarcoma chemotherapy regimens such as gemcitabine and docetaxel have also been reported.<sup>13</sup> Molecular analysis has recently shown that FDSC are more related to low and intermediate grade adult sarcomas.<sup>14</sup>

In this case of metastatic FDSC, second-line chemotherapy with the GDP regimen was well-tolerated by the patient with a partial response and significant clinical improvement. Thus, there is scope for change in the treatment strategy of these rare malignancies in the line of sarcoma from that of lymphoid malignancy.

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### Conflict of Interest

None declared.

### References

1. Van Nierop K, de Groot C. Human follicular dendritic cells: function, origin and development. *Semin Immunol.* 2002;14(4):251-7.
2. Monda L, Warnke R, Rosai J. A primary lymph node malignancy with features suggestive of dendritic reticulum cell differentiation. A report of 4 cases. *Am J Pathol.* 1986;122(3):562-72.
3. Chan JK, Fletcher CD, Nayler SJ, Cooper K. Follicular dendritic cell sarcoma. Clinicopathologic analysis of 17 cases suggesting a malignant potential higher than currently recognized. *Cancer.* 1997;79(2):294-313.
4. Saygin C, Uzunaslan D, Ozguroglu M, Senocak M, Tuzuner N. Dendritic cell sarcoma: a pooled analysis including 462 cases with presentation of our case series. *Crit Rev Oncol Hematol.* 2013;88(2):253-71. doi: 10.1016/j.critrevonc.2013.05.006.
5. Youens KE, Waugh MS. Extranodal follicular dendritic cell sarcoma. *Arch Pathol Lab Med.* 2008;132(10):1683-7. doi: 10.1043/1543-2165(2008)132[1683:EFDCS]2.0.CO;2.
6. Hollowood K, Stamp G, Zouvani I, Fletcher CD. Extranodal follicular dendritic cell sarcoma of the gastrointestinal tract. Morphologic, immunohistochemical and ultrastructural analysis of two cases. *Am J Clin Pathol.* 1995;103(1):90-7.
7. Choi PC, To KF, Lai FM, Lee TW, Yim AP, Chan JK. Follicular dendritic cell sarcoma of the neck: report of two cases complicated by pulmonary metastases. *Cancer.* 2000;89(3):664-72.
8. Dalia S, Shao H, Sagatys E, Cualing H, Sokol L. Dendritic cell and histiocytic neoplasms: biology, diagnosis, and treatment. *Cancer Control.* 2014;21(4):290-300.
9. Chen T, Gopal P. Follicular dendritic cell sarcoma. *Arch Pathol Lab Med.* 2017; 141(4):596-9.
10. Hu T, Wang X, Yu C, Yan J, Zhang X, Li L, et al. Follicular dendritic cell sarcoma of the pharyngeal region. *Oncol Lett.* 2013;5(5):1467-76.
11. De Pas T, Spitaleri G, Pruneri G, Curigliano G, Noberasco C, Luini A, et al. Dendritic cell sarcoma: an analytic overview of the literature and presentation of original five cases. *Crit Rev Oncol Hematol.* 2008;65(1):1-7.
12. Sasaki M, Izumi H, Yokoyama T, Kojima M, Hosono A. Follicular dendritic cell sarcoma treated with a variety of chemotherapy. *Hematol Oncol.* 2017;35(4):905-908. doi: 10.1002/hon.2364.

13. Conry RM. Response of follicular dendritic cell sarcoma to gemcitabine and docetaxel: report of two cases and literature review. *Clin Sarcoma Res.* 2014;4:6. doi: 10.1186/2045-3329-4-6.
14. Perry AM, Nelson M, Sanger WG, Bridge JA, Greiner TC. Cytogenetic abnormalities in follicular dendritic cell sarcoma: report of two cases and literature review. *In Vivo.* 2013;27(2):211-4.