British Journal of Bio-Medical Research Vol.06, Issue 03, Pg.2011 - 2017, May - June 2022

Available Online at http://www.bjbmr.org

BRITISH JOURNAL OF BIO-MEDICAL RESEARCH

Cross Ref DOI: https://doi.org/10.24942/bjbmr.2022.956 Volume 06, Issue 03, May – June 2022

ISSN:2456-9836
IF: 5.719

Review Article

# Follicular Dendritic Cell Sarcoma: A Rare and Misdiagnosed Cancer

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ARTICLE INFO

Article History:
Received on 05th May 2022
Peer Reviewed on 19th May 2022
Revised on 13th June 2022
Published on 30th June 2022

Keywords:
Follicular dendritic cell sarcoma, Unknown primary Pathology

ABSTRACT

Follicular dendritic cell sarcoma is an uncommon kind of cancer that typically affects the lymph nodes, though it can arise in any organ with an immune system. They are frequently misdiagnosed because of their rarity and the lack of diagnostic specificity in clinical, radiological, and morphological data. The following four patients represent a wide range of ages, locales, lesion sizes, and histological findings. Extensive immunohistochemistry including a mixture of >1 dendritic cell marker verified the diagnosis. In the present investigation, the proteins D2-40 and CD21 (Cluster of differentiation 21) collaborated to perform a task. The first programmed death ligand showed promise in two of the three tests (PD-L1). In our entire patient population, just one person had never attempted immunotherapy before we started working with them. By keeping an eye out for these histological features and incorporating novel immunohistochemical markers, doctors can begin treatment for this aggressive disease earlier.



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## INTRODUCTION

Follicular dendritic cell sarcoma is an extremely rare tumour composed of histiocytic and dendritic cells with intermediate malignant potential (FDCS). There have been hundreds of case reports and series published since 1986, when it was first recorded[1]. About a third of patients exhibit lymph node (LN) involvement mostly in the cervical, mediastinal, and axillary regions, in addition to involvement at extranodal sites such as the tonsil, gastrointestinal system, retroperitoneum, mediastinum, and soft tissue. In addition to metastasizing to distant sites, such tumours frequently recur where they first appeared. Due to its low incidence, nonspecific clinical, radiological, and histological features, and, most critically, the fact that it is not commonly considered part of the differential diagnosis, FDCS is frequently misdiagnosed[2]. Knowledge, an eye for subtle histological clues, and immunohistochemistry are required to solve this diagnostic enigma (IHC).

Current research indicates that FDCS, a type of low-grade sarcoma, develops from mesenchymal dendritic cells. Once classified incorrectly as a tumour of myeloid origin involving histiocytes or dendritic cells.

The malignancy known as follicular dendritic cell sarcoma is extremely uncommon. Similarities between this and lymphoma include the presence of swollen lymph nodes without any associated pain. Lymphoma is one type of cancer that can develop in the blood[3].

FDC sarcoma, like other soft-tissue sarcomas, is treated with medication. FDC sarcoma arises from cells with a specialisation in the lymph nodes. The lymphatic system is a portion of the immune system that helps fight off infections by draining excess fluid from the body[4].

Nodal malignancies are where most FDC sarcomas are detected. In contrast, 30% of these tumours manifest in locations other than the head and neck.

- Senses of Smell and Hearing in the Nose and Brain
- mechanism of digestion (bowel, stomach)
- spleen
- liver
- lungs
- skin
- upper torso, between the lungs (mediastinum)

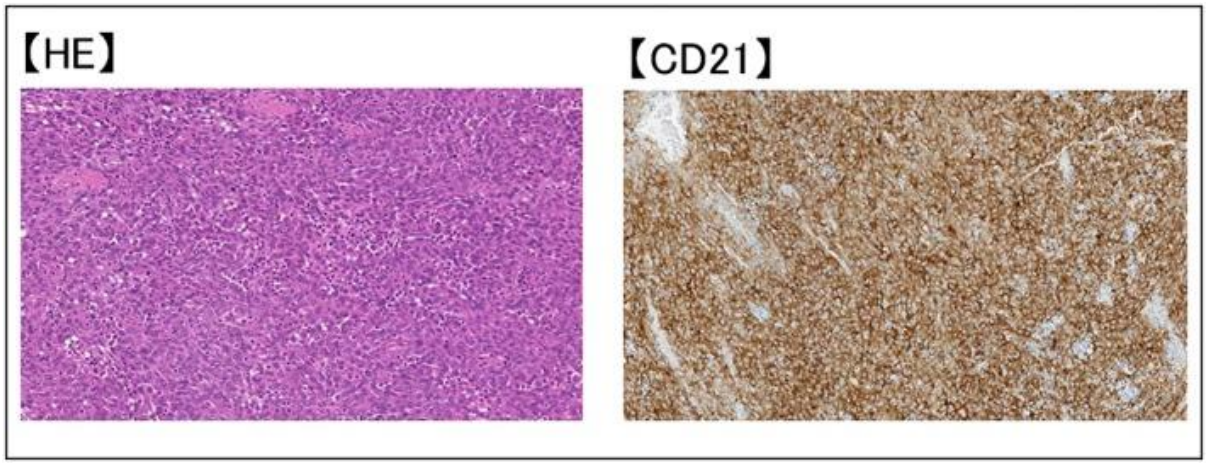
FDC sarcomas are considered extranodal tumours because they do not originate in the lymph nodes.

The diagnosis is based on morphological and immunohistochemical examinations. The distinguishing morphological feature is the formation of fascicles, whorls, diffuse sheets, and nodules by cells that range in shape from spindle like to ovoid. Lymphocytes and plasma cells are regularly observed invading tumour tissue. Tumor cells commonly exhibit CD21, CD23, and CD35, markers of follicular dendritic cell growth[5-7]. Additional indicators include clusterin, fascin, and podoplanin. Studies have demonstrated that the survival rates of patients with local illness do not improve with the addition of adjuvant irradiation (radiation therapy given after surgery)[8-11]. Chemotherapy helps people whose cancer has spread to

multiple organs or cannot be surgically removed. Although there is no established optimal chemotherapy regimen for FDCS, patients are frequently given cytotoxic medicines developed for the treatment of malignant lymphoma or soft tissue sarcoma[12-14]. The collection of case reports is essential for elucidating the factors that contribute to FDCS and developing effective treatments for the condition[15]. We present the example of a long-term FDCS patient who, despite having the disease affect many organ systems, was able to keep it under control using a variety of chemotherapeutic agents.

Tumors that share features of monocytes/macrophages and dendritic cells are quite common and can be either malignant (such as FDCS) or benign (such as histiocytic sarcomas) or indeterminate (such as Langerhans cell sarcomas) (eg, Langerhans cell histiocytosis, Erdheim-Chester disease)[16]. FDCS is not created in the marrow or blood, like other sarcomas. Instead, it is a sarcoma of the soft tissues and responds to the same therapies as other sarcomas[17].

*Figure:1 Hematoxylin and eosin staining and immunochemical features of the tumor*




**ETIOLOGY**

Follicular dendritic cell sarcoma has an unknown origin. Due to the small number of instances, researching the causes of uncommon cancers is challenging. It has been recognised by the medical community that Castleman has follicular dendritic cell sarcoma[18]. Benign lymphoma refers to noncancerous tumours of the lymph nodes. FDC sarcomas of the liver and spleen are associated with Epstein Barr virus, according to studies.

**EPIDEMIOLOGY**

The frequency of follicular dendritic cell sarcoma (FDCS) is unknown because it is so uncommon. Few cases are reported in the medical literature[19]. Four percent of all soft tissue sarcomas are FDCS. Although women are more likely to experience the inflammatory forms of this disease, it affects both sexes equally.

**SIGNS AND SYMPTOMS**

Lymphoid follicular dendritic cells (FDCs) are a kind of dendritic cell that plays a crucial function in germinal centre response control and antigen presentation to B cells[20]. Lymph nodes are where roughly 70% of FDCS sufferers show symptoms,

with the remaining 30% showing symptoms elsewhere.

Due to the dynamic nature of tumour development, FDCS can show up in many forms and places. Slow, painless lymph node enlargement is the defining sign. Since this symptom is shared by many diseases, including the common cold, it cannot be used to diagnose a patient on its own[21]. Added symptoms incorporate a hacking cough, a painful throat, difficulty swallowing, a diminished appetite, and excessive fatigue.

**Diagnostic Process**

In all likelihood, you will have to take more than one test. Numerous medical diseases are diagnosed with the help of imaging tests like MRI, CT, PET, and x-rays[22].The only way to find out what's going on is to have a doctor take a biopsy of the lump and look at the cells under a microscope. Follicular dendritic cell sarcomas are difficult to detect because they look similar to lymphomas and other types of sarcomas.

**Protein Markers' Significance**

Follicular dendritic cell sarcoma cells secrete proteins (markers). Proteins like CD21, CD23, and CD35 all have unique purposes. Assays have been created by researchers that may help identify these proteins, which could lead to a more precise diagnosis. Immunohistochemistry is the use of antibody staining methods[23].

**Therapeutic Treatment**

The conventional treatment for FDCS is radical resection, but the use of adjuvant radiochemotherapy is controversial. The following conclusions may not be robust because survival curves are based on a meta-analysis of limited series and case reports. This means that more research is required to fully understand the results of adjuvant therapy. Guidelines for treating follicular dendritic cell sarcoma are not as well-developed as they are for other types of malignancy due to the rarity of this disease. Your expert will give you the rundown. Overall condition of your body and health whether or not the sarcoma has spread to other parts of the body, its size, how distinct the sarcoma cells are from normal cells, and how quickly they replicate (grade) After malignant tissue has been removed surgically, further treatment with chemotherapy or radiation may be necessary[24].

The most effective treatment for FDCS is resection, which is sometimes paired with adjuvant chemotherapy or radiation therapy. About a quarter of people do not experience a recurrence, while another quarter develop distant metastases. Those who are diagnosed early have an 82% chance of surviving for two years, while those with locally advanced disease have an 80% chance, and those with distant metastases have a 42% chance. High mitotic rate (5 mitoses per 10 high-power fields [HPFs]), severe cytologic atypia, and intra-abdominal placement are additional variables associated with a poor prognosis[25].

**DISCUSSION**

Monda et al. were the first to classify FDCS as a rare tumour of histiocytic lineage in 1986. They typically affect LN and appear in people between the ages of 20 and 40. Patients in this series ranged in age from adulthood (the oldest patient was 70) through advanced years, with men making up a somewhat larger proportion than women[26]. Only one patient had lymph node involvement; the others had abdominal or nasal tumours that did not affect lymph nodes. Since extranodal FDCS are

frequently misinterpreted as soft tissue tumours, inadequate therapy is often administered, resulting in poor outcomes[27].

The presence of one or more dendritic cell markers on immunohistochemical staining can validate a morphological diagnosis of FDCS. Even within a single tumour, histological analysis reveals a wide variety of growth morphologies[28]. It has been documented in case series that structures ranging from the storiform (the most common) through the fascicular and the syncytial, or a combination of these, have been present.

**Closing Remarks**

When a pathologist is still unable to make a definitive diagnosis of an undifferentiated neoplasm despite employing a battery of immunostains, this situation is known as a neoplasm with a high rate of misdiagnosis. It takes a combination of CD21, D2-40, and other follicular dendritic cell markers, as well as an understanding of the tumor's morphological spectrum, to detect and treat these malignant tumours efficiently. Even with a core needle biopsy, mediastinal FDCS might be difficult to find due to its rarity and absence of clear clinical symptoms. The most likely cause of mediastinal FDCS is lymphoma, thus investigating other possible reasons is probably futile. A deeper knowledge of this evasive cancer is necessary for more precise diagnostics.

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**How to cite this article:**
**Dr Pramod Khatri *Follicular Dendritic Cell Sarcoma: A Rare and Misdiagnosed Cancer* Br J Bio Med Res, Vol.06, Issue 03, Pg.2011 - 2017, May - June 2022. ISSN:2456-9739 Cross Ref DOI : https://doi.org/10.24942/bjbmr.2022.956**

**Source of Support:** Nil **Conflict of Interest:** None