Primary lung follicular dendritic cell sarcoma with rare paraneoplastic pemphigus：a case report

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Case Report

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Abstract

Background:

follicular dendritic cell sarcoma is a rare soft tissue tumor. The incidence is even lower when the lung is the primary site and combined paraneoplastic pemphigus. The purpose of this report is to present the clinicopathological features of this neoplasm in a 29-year-old man. In our case, this tumor caused the patient to develop a paraneoplastic syndrome as well as systemic symptoms. Although local excision of the primary tumor is the treatment of choice, patient required long-term administration of hormones and immunosuppressants. This case provides a new understanding of FDCS with paraneoplastic syndrome.

Case presentation:

A 29-year-old man was admitted to our hospital with “intermittent cough and sputum for more than 8 months, oral mucosal erosion for 6 months”. The patient had systemic symptoms, including coughing, genital and eye corneal ulcer, photophobia, decreased vision, multiple oral pseudomembranes , local chickenpox and multiple red papules all over the body. The patient underwent thoracoscopic lobectomy and regional lymphadenectomy and pathological biopsy of oral pseudomembranes was performed. Histopathological findings revealed Primary lung mucosal cell sarcoma with paraneoplastic pemphigus, and postoperatively, patient required long-term administration of hormones and immunosuppressants.

Conclusion:

Follicular dendritic cell sarcoma (FDCS) is a rare tumor associated with paraneoplastic pemphigus, which derived from follicular dendritic cells. Paraneoplastic pemphigus (PNP) is always associated with neoplasm, including gastric adenocarcinoma and lung cancer. the vast majority of FDCS occurs in lymph nodes, so extranodal FDCS cases remain challenging to diagnose, particularly when it occurs in an uncommon site or the histopathologic morphology is atypical. This article emphasizes the rarity of lung extranodal FDCS, and increases awareness of FDCS with paraneoplastic syndromes.

Background

Follicular dendritic cell sarcoma (FDCS) is a rare malignancy derived from follicular dendritic cells, which form a meshwork in lymphoid follicles and have the role of antigen capture and presentation (1).Not surprisingly,the vast majority of FDCS occurs in lymph nodes and the most common are cervical, mediastinal, or axillary lymph nodes.In less than one-third of cases, FDCS can also be found in extranodal sites, including the tonsils, nasopharynx, pancreas, liver, and peripancreatic and peritoneal tissues.follicular dendritic cell differentiation usually has an indolent course, but malignant transformation of the progenitor of these cells results in follicular dendritic cell sarcoma.

Paraneoplastic pemphigus (PNP) was first reported by Anhalt in 1990 (2).It is a rare autoimmune skin disease that is classified as the group of blistering diseases.PNP is always associated with neoplasm, including gastric adenocarcinoma and lung.PNP shows a mortality rate up to 90%, and its early diagnosis is not simple (3). Therefore, It is very important to make every effort to diagnose PNP as early as possible.

Despite having typical histopathologic features and unique immunophenotype, extranodal FDCS cases remain challenging to diagnose because it is very rare and often not considered, particularly when it occurs in an uncommon site or the histopathologic morphology is atypical .This article emphasizes the rarity of lung extranodal FDCS, and increases awareness of FDCS with paraneoplastic syndromes.

Case Presentation

A 29-year-old man was admitted to our hospital with “intermittent cough and sputum for more than 8 months, oral mucosal erosion for 6 months”. This is the patient’s fourth hospital admission. The patient developed from cough and sputum with a small amount of blood streaks to complicated with genital ulcers, eye corneal ulcer, photophobia, decreased vision, multiple pseudomembranes in the mouth, and finally multiple red papules all over the body and local chickenpox. The initial diagnosis included tuberculosis and Behcet’s disease. The initial anti-infection and anti-tuberculosis treatment progressed to hormone therapy. However, the patient’s symptoms worsened. We escalated to a combination therapy of hormones, gamma globulin shock therapy and immunosuppressive agents. A CT scan of his chest showed a mass on the right hilar of the lung, a dense mass of soft tissue was also seen in the right hilar area (Figs. 1A,1B), the larger area was about 49mm*30mm. And the bronchus of both lungs was slightly dilated, accompanied by enlargement of the mediastinal slymph nodes. Pathological examination of the patient’s lips and nails was consistent with paraneoplastic pemphigus. Taking into account the patient’s right hilar mass, we decided to perform thoracoscopy. Part of the right thoracic cavity was strip-like adhesions without pleural effusion. The mass invaded the middle bronchus of the right lung. The right middle and lower lung lobes were resected according to the preoperative plan (Fig. 2). During the operation, we resected the involved lymph nodes under the hilar and carina under the visual field. Histopathological examination of the specimen showed a large number of lymphocytes and scattered large cells in the proliferating fibrous tissue of lesion.

Immunohistochemistry examination of lung lesions showed CD21 and CD35 positive (Figs. 3); CD23, CD34 and S-100 negative. According to these, the patient was diagnosed with follicular dendritic cell sarcoma(FDCS).The differential diagnosis were lymphoepithelioma-like carcinoma, inflammatory pseudotumor, malignant peripheral nerve sheath tumor,gastrointestinal stromal tumor. He recovered well after the operation, and his systemic symptoms gradually improved. After a month, the pemphigus and genital ulcers were completely relieved. Although the symptoms of eye corneal ulcer□photophobia and decreased vision still reminded, they decreased over time. And the patient had been taking immunosuppressants such as tacrolimus and cyclosporine.

Discussion

Follicular dendritic cell sarcoma (FDCS) is a rare tumor associated with paraneoplastic pemphigus (4).Its etiology and pathogenesis remain unclear.Chan et al (5) has conducted a follow-up study on one case with subtypes transparent tube Castleman disease (hyaline-vascular castleman disease, HVCD) which was occurred in the nasopharynxon. In their study, they found that hyperplastic follicular dendritic cells (FDC) of recurrent HVCD eventually developed into sarcoma, suggesting that HVCD is a precursor lesion of FDCS, and its development stage may be: hyperplastic follicular dendritic cells (FDC) → atypical hyperplasia → tumor.Tumors mostly occur in lymph nodes (abdomen, mediastinum, neck), and a small amount occurs in lymph nodes outside tissues, such as palate, pharynx, tonsils, parapharyngeal tissue, thyroid, gastrointestinal tract, etc. The histopathological characteristics of FDCS are oval, eosinophilic cytoplasm, inconspicuous nucleuses of the tumor cells which arranged in cords, nests shape, and fascicles (6, 7).Besides, Small lymphocytes were visible around the tumor blood vessels with cellular atypia and necrosis.To date, there is no generally accepted criteria for the diagnosis of FDCS.The diagnosis of the disease is mainly based on histopathological characteristics, immunohistochemical stainingcharacteristics, and ultrastructural analysis of tumor cells, while excluding other histiocytic and lymphoproliferative diseases such as non-Hodgkin lymphoma (NHL) and interdigital dendritic cell sarcoma (IDCS),etc (8, 9).

Paraneoplastic pemphigus (PNP) was first reported by Anhalt in 1990 (2).PNP is associated with follicular dendritic cell sarcoma,It is a rare autoimmune skin disease that is classified as the group of blistering diseases.PNP is always associated with neoplasm, including gastric adenocarcinoma and lung and colon,etc.Nguyen et al.(10) introduced the concept of paraneoplastic autoimmune multiorgan syndrome (PAMS)which emphasized the systemic nature of PNP In 2001.

Due to the rarity of FDCS, there is currently no standard treatment strategy. So far, Surgical resection is best treatment option for limited disease. More importantly, glucocorticoid and immunoglobulin therapy combined with hormone therapy are still given after operation (11).For patients with systemic disseminated FDCS (multiple lymph nodes), large mass or unresectable surgery, chemotherapy or even a combination of radiotherapy and chemotherapy should be considered. At present, the chemotherapy most reported for FDCS is CHOP (cyclophosphamide, doxorubicin, vincristine, prednisone) based joint programme which is often used to deal with the non-Hodgkin's lymphoma, and generally given 3 ~ 6 cycles of treatment (12, 13).However, some literatures show that these chemotherapy strategies can not produce lasting anti-tumor effects on FDCS, and there is a certain risk of recurrence and lack of long-term efficacy. Therefore, we should continue to further study the pathological mechanism of FDCS, systematically analyze the correlation between FDCS and paraneoplastic pemphigus, and developed a new treatment plans that are conducive to long-term remission and prolong the survival stage.

Accurate diagnosis of FDCS, especially extranodal FDCS, is still the biggest challenge. because it is very rare and often neglected, particularly when it occurs in an uncommon site or the histopathologic morphology is atypical.Most pathologists believe that appropriate specific immunohistochemical markers will assist in the diagnosis of FDCS.The neoplastic spindle cells of FDCS are typically immunohistochemically positive for CD21 (Figs. 3B), CD35 (Figs. 3C), and CD23 (14).These three are

traditional markers of FDC. Their positive expression can confirm the diagnosis of FDCS. Clusterin is also highly sensitive and specific for FDCS when strongly and diffusely positive (15).Recently, studies have confirmed that podoplanin (D2-40) is a mucin-type transmembrane glycoprotein that is strongly expressed in FDCS but not in normal or tumor lymphoid cells (15, 16).In addition, recent reports suggest that up to half of FDCSs show immunohistochemical positivity for p16 (17).But p16 positivity is meaningful for oropharyngeal lesions with characteristic histologic features of FDCS. Although the neoplastic cells of FDCS cells can selectively immunohistochemical express vimentin, CD68 and S100, none of these markers are specific for FDCS (18, 19).Due to the lack of specificity of these markers for FDCS, misdiagnosis may occur if FDCS is not considered in the differential diagnosis and the markers described above are not applied.

Conclusion

The occurrence of Extranodal FDCS was a rare case, particularly in conjunction with Paraneoplastic pemphigus.Diagnosis of FDCS is highly dependent on immunohistochemistry correlation with clinical presentation. For now, given the lack of definitive molecular findings,the diagnosis of extranodal FDSC undoubtedly brings great challenges to pathologists.At present, complete resection of the mass and regional lymphadenectomy are still the most important treatment methods for FDCS, and continuous or intermittent administration of hormones and immunosuppressants is required after surgery.Our case will give pathologists and clinicians a new perspective on diagnosis and treatment of Extranodal FDCS with Paraneoplastic syndrome.

Abbreviations

FDSC: Follicular dendritic cell sarcoma; PNP: Paraneoplastic pemphigus.

Declarations

Ethics approval and consent to participate

Ethical approval was given by the Ethics Committee of the First Afliated Hospital of Zhengzhou University, Zhengzhou, Henan Province, China. And the patient agreed to participate in our study.

Consent for publication

For publication of this case report, including the images contained within, informed written consent was obtained from the patient. A copy of the consent form is available for review by the Editor of this journal.

Availability of data and material statement

Data sharing is not applicable to this article as no datasets were generated or analysed during the current study.All the pictures related to the article can be found in the article.

Competing interests

The authors declare that they have no competing interests

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Authors' contributions

SHL: Drafting of the manuscript and treated the patient. YQ: Provided the overall supervision of the case and the production of the manuscript. BD, CLW and ZHL: Designed and participated in this surgery. All authors read and approved the fnal manuscript.

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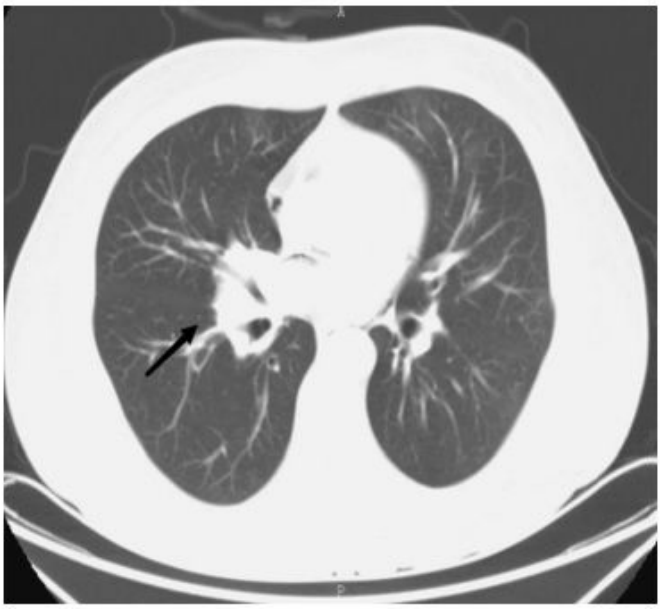
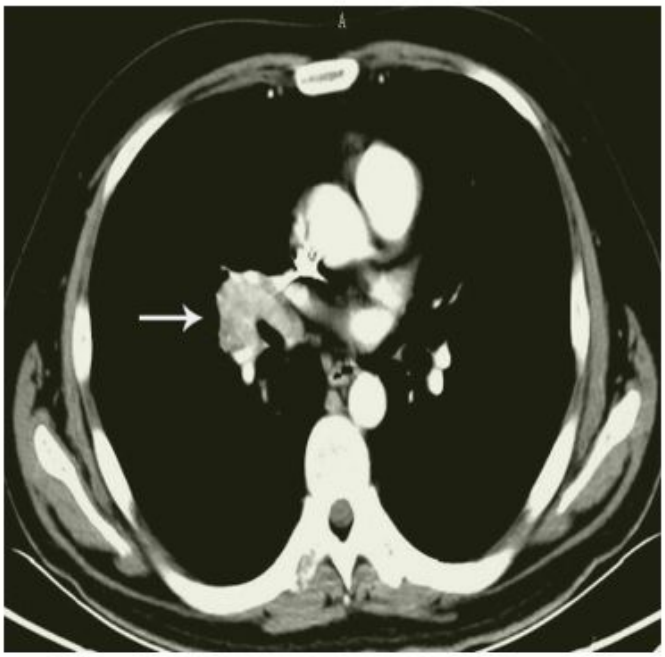
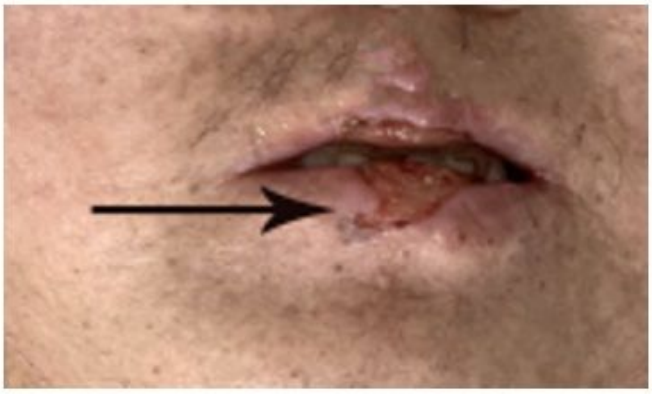
Figures



(Figure 1A)



(Figure 1B)



(Figure 1C)

Figure 1

Chest CT scan showing a mass on the right hilar of the lung **(A,B)**; Paraneoplastic pemphigus patients with mouth lesions**(C)**.

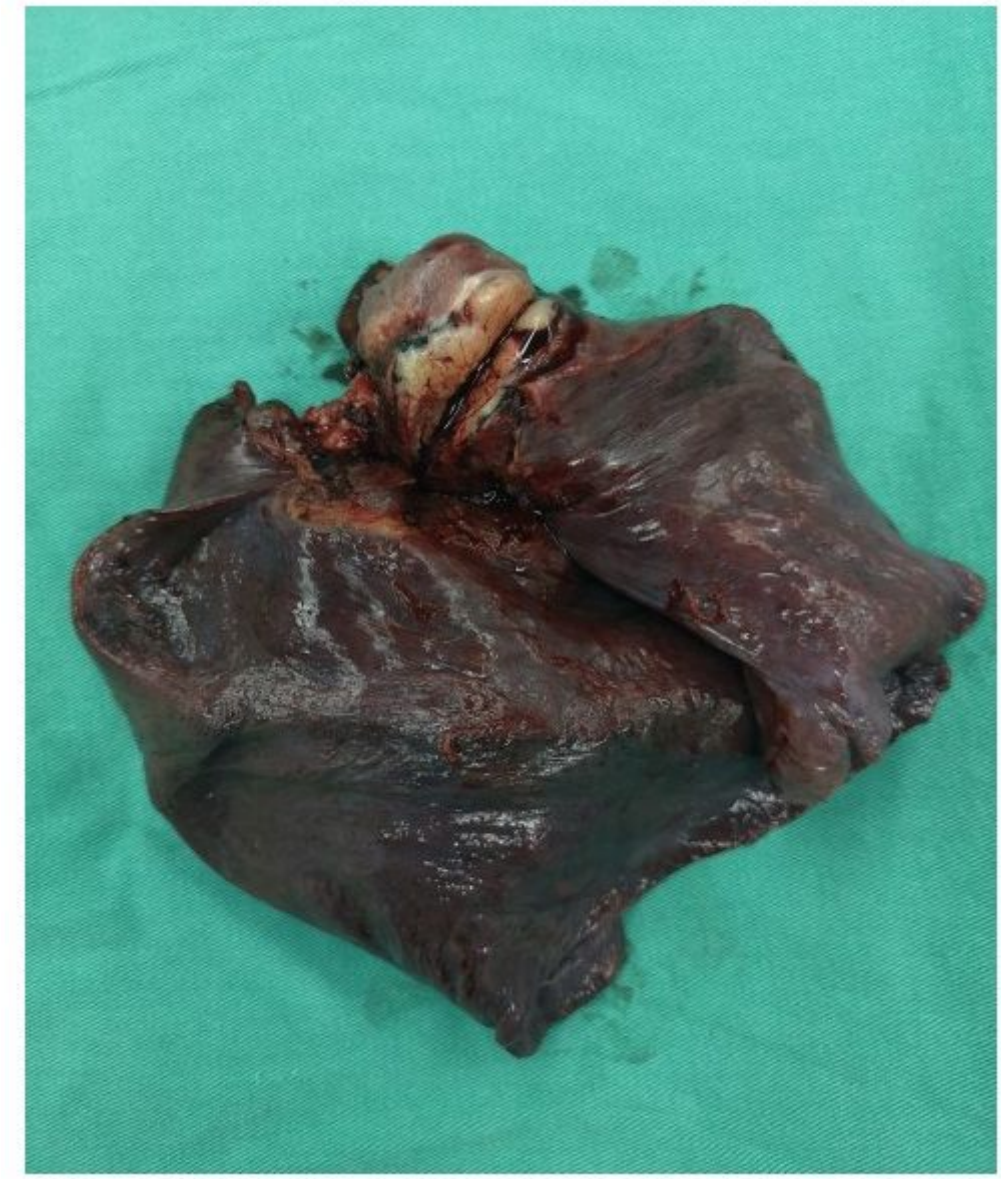
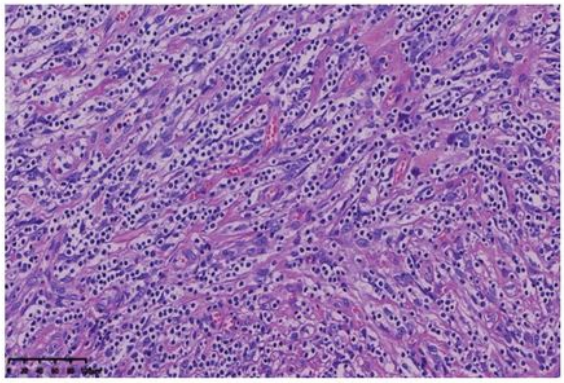
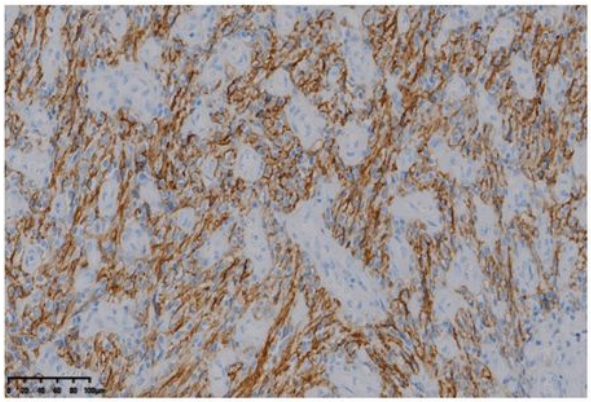


Figure 2

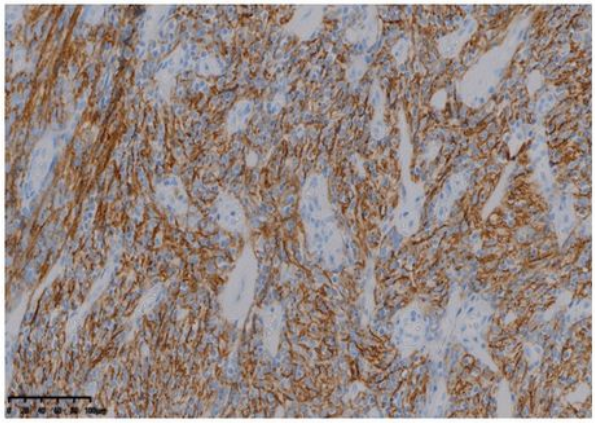
A view of the shape of the tumor during the operation.



(A) HE staining



(B) CD21+



(C) CD35+

Figure 3

Immunohistochemical staining