

The Role of VATS in the Diagnosis of Sarcoidosis

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INTRODUCTION

Sarcoidosis is a multisystemic disorder characterized by the presence of noncaseating granulomas and the proliferation of epithelioid cells [1]. Sarcoidosis occurs in all racial groups and at all ages, although it usually develops before the age of 50 years, with the incidence peaking at 20 to 39 years [2]. Sarcoidosis can involve multiple organs, especially the lungs and intrathoracic lymph nodes, eyes and skin. The cause and pathogenesis is unknown; however, a number of etiologies have been proposed in recent years, primarily based on genetic and immunologic factors [3]. The diagnosis of sarcoidosis is commonly established based on clinical and radiologic findings that are supported by histologic findings. The clinical symptoms of sarcoidosis include fatigue, night sweats and weight loss. Pleural effusion is rare in patients with pulmonary sarcoidosis, about 2.8-5% of these patients exhibiting pleural effusion [4-6]. Pleural effusion in sarcoidosis is often an exudate. Cardiac sarcoidosis is often ignored but could cause sudden death. The prognosis of cardiac sarcoidosis is variable, but mortality rates of untreated cardiac sarcoidosis are high [7].

The typical radiologic findings associated with sarcoidosis include symmetric, bilateral hilar and paratracheal lymphadenopathy, with or without concomitant parenchymal abnormalities. However, in 25-30% of cases, the radiologic findings are atypical, which causes difficulty in making a correct diagnosis [8]. Atypical forms of intrathoracic sarcoidosis have been described as unilateral or asymmetric lymphadenopathy, necrosis or cavitation, large opacity, ground glass opacity, airway abnormality, pleural involvement and the reversed halo signs [8-10].

¹⁸F-FDG PET has been proven to be a very useful imaging technique in diagnosis, disease activity assessment, monitoring treatment response, and risk assessment in patients with tumors [11]. In suspected or known sarcoidosis patients, PET/CT may be useful in the evaluation of disease extent and monitoring treatment response [12]. In atypical, complex, and multisystem sarcoidosis, PET/CT plays an important role for evaluation of the localization and effect of treatment [13]. Although it has so many advantages, PET-CT can cause many false positive and its role in the diagnosis of sarcoidosis is limited [14].

For improving pulmonary function and determining the presence of lesions in other organs, it is important to make timely and correct diagnosis. However, delayed diagnosis is often associated with an impaired lung function and medication induced impairment of the other organs. Since the diverse forms of the presentations and the lack of reliable diagnostic test, the diagnostic of this disease is a big challenge. The definite diagnosis of sarcoidosis depends on a typical clinical presentation, compatible imaging, physiologic studies, a pathological examination revealing non-caseating granulomas, and the absence of a fungal or mycobacterial infection. To further clarify the diagnosis, a lymph node sampling was necessary.

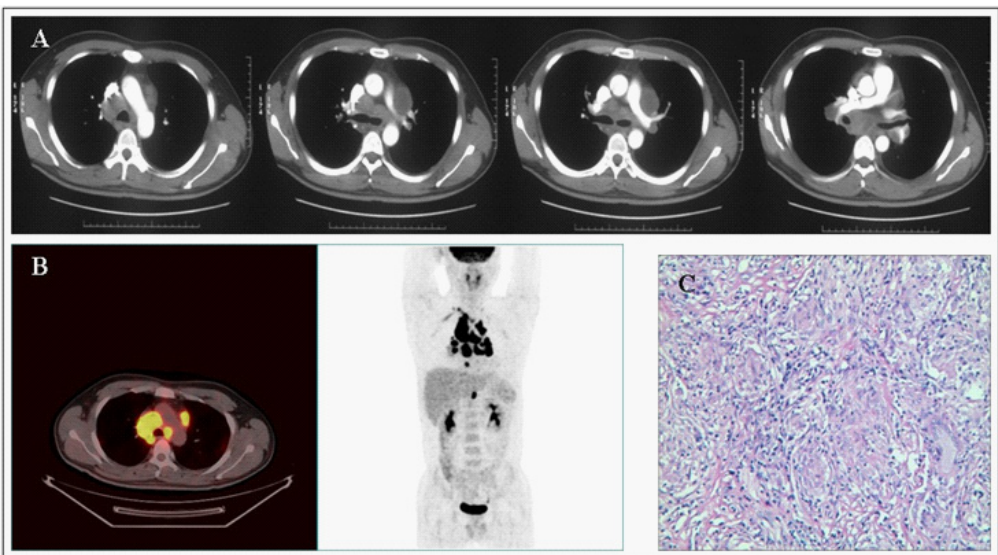
Video assisted thoracoscopic surgery (VATS), which was rapidly developed in the past decade, has played an important role in the diagnosis and treatment of thoracic disease [15]. In the last decades, the minimally invasive surgery developed rapidly which greatly reduced the trauma of patients. Thoracic surgeons from all over the world are paying more attention to VATS and more advanced surgical instruments are used in VATS. Surgical instruments have replaced two hands of surgeons, and a video-thoracoscope is used to replace direct vision through the incisions. Thoracic surgeons operate only through small ports about 1-3cm in length. In addition, VATS has developed from original pattern 3-ports-VATS to single-port-VATS and even robot-assisted-VATS. The revolution of technique results in a smaller incision, less blood loss, pain and postoperative complications, as well as a shortened length of stay in hospital.

CASE REPORT

VATS could well performed in the diagnose of sarcoidosis. In clinic, we have much experience to take advantage of VATS to make a definite diagnosis for sarcoidosis patients. Here, we present a case as following: A 32-year-old man presented with mild cough for 1-month period. He got fever for 4 days with the highest temperature of 38.7°C prior to the hospitalization. An enhanced chest computed tomography (CT) indicated multiple mediastinal lymph node enlargement and

the lungs were clear (Panel A). Physical examination revealed that cervical, supraclavicular, inguinal lymph nodes could be palpated. An enhanced magnetic resonance imaging (MRI) scan of the head was unremarkable. Laboratory evaluation revealed a cyfra21-1 level of 3.73 ng/ml (normal value, 0-3.3), and normal levels of other tumor markers including carcino-embryonic antigen (CEA), squamous cell carcinoma antigen (SCC) and neuron-specific enolase (NSE). The anti-Tuberculosis antibody (TB-Ab) antibody was also negative. A body FDG PET/CT scan demonstrated remarkably increased FDG uptake in the enlarged lymph nodes from mediastinum and abdomen, therefore, lymphoma was preliminarily considered (Panel B). Supraclavicular lymph node biopsy by EBUS-TBNA found collections of inflammatory cells. To further clarify the diagnosis, a lymph node sampling adjacent aortic arch was performed by VATS. The pathological examination was granulomatous lesions and the diagnosis of sarcoidosis was explicit (Panel C). The patient will switch to respiratory department to receive following therapies 5 days after the operation.

The pathological diagnosis of sarcoidosis was determined after VATS procedure. Timely and correct diagnosis is very important for improving pulmonary function and determining the presence of lesions in other organs, while delayed diagnosis is often associated with an impaired lung function and medication induced impairment of the other organs [16]. So the diagnosis of sarcoidosis should be promptly determined in order to avoid treatment delay. Surgical intervention is an important modality for the attainment of a biopsy. In traditional open thoracic operations, surgeons have to make a huge incision and forcibly retract the ribs so that they could put two hands into the thorax of patients for a major operation. Therefore, patients have to undergo much pain, a longer time in bed and may have many potential postoperative complications. For the patient we presented above, if he was performed with open thoracic surgery, it would take a longer time for the recovery and to receive the following internal treatment.



CONCLUSION

In a conclusion, VATS could be used as an efficient minimally invasive method for the diagnosis of sarcoidosis, due to the achievement of sufficient tissue samples for the pathological examination. Furthermore, in comparison with the traditional open techniques, VATS offers less postoperative pain, a more rapid recovery, and significantly less complications [17,18].

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