

Primary lung adenocarcinoma harboring upper mediastinal lymphatic skip metastasis of cervical squamous cell carcinoma: A case report and literature review

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Received January 9, 2024; Accepted June 25, 2024

DOI: 10.3892/ol.2024.14614

Abstract. The upper mediastinal lymph nodes are a rare site of metastasis in early-stage cervical cancer, but they are a common site of metastasis in lung cancer. Notably, standard approaches for identifying the source of metastasis and subsequent treatment are currently lacking. The present study describes the case of a patient with primary lung adenocarcinoma harboring upper mediastinal lymphatic skip metastasis from cervical squamous cell carcinoma 2 years after a radical hysterectomy. During video-assisted thoracoscopic surgery, it was indicated that the patient had a tendency for metastasis to the upper mediastinal lymph nodes from the lung tumor. Pathological examination confirmed the presence of metastasis; however, it was confirmed to originate from cervical carcinoma, rather than lung adenocarcinoma. In conclusion, for patients with lung cancer and concurrent malignancies, metastatic lymph nodes discovered during surgery may originate from the previous malignancy. Surgical management of oligometastatic lymph nodes in the mediastinum can be a potential treatment option, albeit one that may necessitate the integration of adjuvant treatment modalities as warranted by the individual case.

Introduction

Lung cancer is the leading cause of cancer-related mortality worldwide and lymph node metastasis serves as the primary mode of lung cancer spread; therefore, lymph node dissection is important in surgery (1). Notably, the chosen surgical approach depends on various factors. The Japan Clinical Oncology Group (JCOG) 0802 study demonstrated that lung segmentectomy can be an appropriate option for lung nodules sized <2 cm and with a consolidation-to-tumor ratio of >0.5, as it offers comparable survival outcomes to lung lobectomy (2). Additionally, intraoperative gross appearance and the experience of the surgeon are factors that should be considered. For example, if preoperative imaging does not indicate significant enlargement of mediastinal lymph nodes and meets the criteria for segmentectomy according to JCOG 0802, but the surgeon encounters larger, harder or fused lymph nodes intraoperatively, this may suggest a potential risk of lymph node metastasis; in such cases, lobectomy coupled with systematic lymph node dissection is recommended to ensure complete resection and to minimize the risk of recurrence.

Cervical cancer is among the most dangerous types of cancer in terms of female survival; it is the fourth leading cause of cancer-associated death in women worldwide (1). Metastatic cervical cancer exhibits an inferior 5-year survival rate compared to non-metastatic cervical cancer, typically <20% (3,4), and lacks standard treatment protocols. Oligometastatic cervical cancer can be effectively managed through various treatment modalities, including radical radiotherapy, surgical resection and systemic therapy; among the latter, chemotherapy, such as cisplatin combined with paclitaxel, and immunotherapy, such as bevacizumab or pembrolizumab, are commonly used. These therapies have significantly enhanced the survival rates of patients with oligometastatic cervical cancer (5,6). Cervical cancer primarily spreads through two mechanisms: Lymphatic metastasis involving pelvic, supraclavicular, mediastinal and para-aortic lymph nodes, and hematogenous metastasis to the lungs, liver or brain. Typically, cervical cancer metastasizes to neighboring tissues and organs; however, >10% of patients develop distant extra-pelvic metastases (7). Notably, the chest, encompassing the lungs and mediastinal lymph nodes, represents one potential site, with the latter contributing to just 1%

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Abbreviations: JCOG, Japan Clinical Oncology Group; PET/CT, positron emission tomography/computed tomography; SUV, standardized uptake value; VATS, video-assisted thoracoscopic surgery; SCC, squamous cell carcinoma; DPFS, disease progression-free survival; OS, overall survival; RCC, renal cell carcinoma

Key words: lung cancer, cervical cancer, skip metastasis, mediastinal lymph node metastasis

of metastatic cervical cancer cases (8). Lymphatic metastasis of cervical cancer usually occurs step by step, first from pelvic lymph nodes to iliac common lymph nodes, then to para-aortic lymph nodes, and it can continue to metastasize to supraclavicular lymph nodes. Notably, skip metastasis, which refers to metastasis that does not follow the normal direction of lymphatic drainage step by step, but directly skips the primary lymph node areas and occurs in the more distant lymph nodes, rarely occurs (9). The present study describes the rare case of primary lung adenocarcinoma with upper mediastinal lymph node metastasis originating from early-stage cervical squamous cell carcinoma.

Case report

A 72-year-old woman presented at the Department of Thoracic Surgery, Union Hospital, Tongji Medical College, Huazhong University of Science and Technology (Wuhan, China) in December 2020. A mass was discovered in their right upper lung during a routine computed tomography (CT) scan 2 months ago. The patient had undergone radical hysterectomy for cervical tumor at Sun Yat-sen University Cancer Center (Guangzhou, China) in October 2018. The postoperative pathology had revealed stage IB cervical squamous cell carcinoma. The patient did not receive any adjuvant treatment after surgery and had been regularly followed up. During each follow-up, they underwent CT examinations of the lower abdomen and pelvis, along with tumor marker tests for squamous cell carcinoma (SCC) antigen, carcinoembryonic antigen (CEA), cancer antigen (CA) 125, and CA19-9. The results indicated no signs of metastasis or recurrence. Given the advanced age and malignant tumor history of the patient, comprehensive examinations were conducted after discovery of the lung mass, including tumor marker tests, echocardiography, CT coronary angiography and whole-body positron emission tomography (PET)/CT. The tumor markers tested in December 2020, including CEA, SCC antigen, neuron-specific enolase-1 and cytokeratin 19 fragment antigen 21-1, were within the normal range (Table I). The PET/CT scan indicated the presence of a tumor in the right superior lobe, measuring ~1.5x1.6 cm. The tumor showed a visible cavity, increased fluorodeoxyglucose (FDG) uptake, and a maximum standardized uptake value (SUV) ranging from 1.5 to 2.1. No enlarged lymph nodes or abnormal radioactive distribution were observed in the mediastinum, and the uterus and bilateral adnexa exhibited normal postoperative changes. No regional metabolic abnormalities were detected outside the thoracic cavity, suggesting no malignant tumor recurrence. The postoperative follow-up data for cervical cancer also showed no signs of tumor recurrence. The results of preoperative CT coronary angiography and electrocardiogram, and levels of tumor markers are shown in Figs. S1 and S2, and Table I, respectively.

After adequate preoperative preparation, the initial surgical method was performance of an apical segmentectomy of the right superior lobe and systematic lymph node dissection. The surgery was conducted using video-assisted thoracoscopic surgery (VATS) according to the planned approach. During the procedure, enlarged and hardened upper mediastinal lymph nodes were observed, which were firmly adhered to the surrounding tissues, indicating a possible metastasis. To

Table I. Tumor markers.

Marker	Result	Reference
CEA	1.80 $\mu\text{g/ml}$	<5.0 $\mu\text{g/ml}$
SCC antigen	1.00 ng/ml	<1.5 ng/ml
CYFRA 21-1	1.55 ng/ml	<2.5 ng/ml
NSE-1	9.60 $\mu\text{g/l}$	<16.3 $\mu\text{g/l}$

CEA, carcinoembryonic antigen; SCC, squamous cell carcinoma; CYFRA 21-1, cytokeratin 19 fragment antigen 21-1; NSE-1, neuron-specific enolase-1.

ensure an R0 resection and minimize the risk of recurrence, a decision was made to instead perform a right upper lobe resection. There was no significant hemorrhage during the operation, and the vital signs of the patient remained stable. A chest X-ray conducted on day 2 post-surgery revealed satisfactory lung re-expansion (Fig. S3). The chest tube was removed the following day, and the patient was discharged on postoperative day 5.

Based on a comprehensive evaluation, it was suspected that the patient had lymph node metastasis in the N2 region, suggestive of stage IIIA lung cancer (pT1bN2M0). However, the pathology report indicated that the initial assessment was not accurate. Although lymph node metastasis in the upper mediastinum was confirmed, it was not metastasis of primary lung adenocarcinoma. As shown in Fig. 1, immunohistochemical staining, performed as described previously (10-12), exhibited positive reactions for pan cytokeratin (CK), CK5/6 and P40, whereas thyroid transcription factor-1 staining was negative, indicating that there was metastasis of SCC in the lymph node. In addition, persistent human papillomavirus (HPV) infection causes upregulation of P16 (13); therefore, P16 positivity of the patient's specimen can be a marker for cervical lesions. As for the protocol of hematoxylin and eosin staining, the tumor tissue was excised and immersed in 10% formalin at room temperature for 24 h for fixation, followed by dehydration in alcohol of increasing concentrations. Subsequently, it was placed in xylene and embedded in paraffin wax; the embedded wax block was fixed on a microtome and sliced into 4- μm sections. The thin sections were then flattened in 40°C water and adhered to microscope slides, and were finally dried in a 60°C incubator for 3 h. The sections then underwent a series of deparaffinization and hydration steps in a descending series of ethanol. The sections were stained with hematoxylin solution for 2 min, dipped briefly in hydrochloric acid alcohol for differentiation (1 sec), and rinsed in water for bluing. Next, they were immersed in 1% aqueous eosin stain for 2 min, followed by a quick rinse in tap water (30 sec). Subsequently, the sections were dehydrated again in an ascending series of ethanol. Finally, the prepared slides were observed under an optical microscope.

Given the patient's prior history of cervical cancer, the pathologist performed HPV mRNA *in situ* hybridization using the RNAscope HPV HR18 Multi-Subtype Detection Kit (cat. no. RS-8002; OriGene Technologies, Inc.) and HPV HR-18 probes, which encompass 18 high-risk HPV subtypes

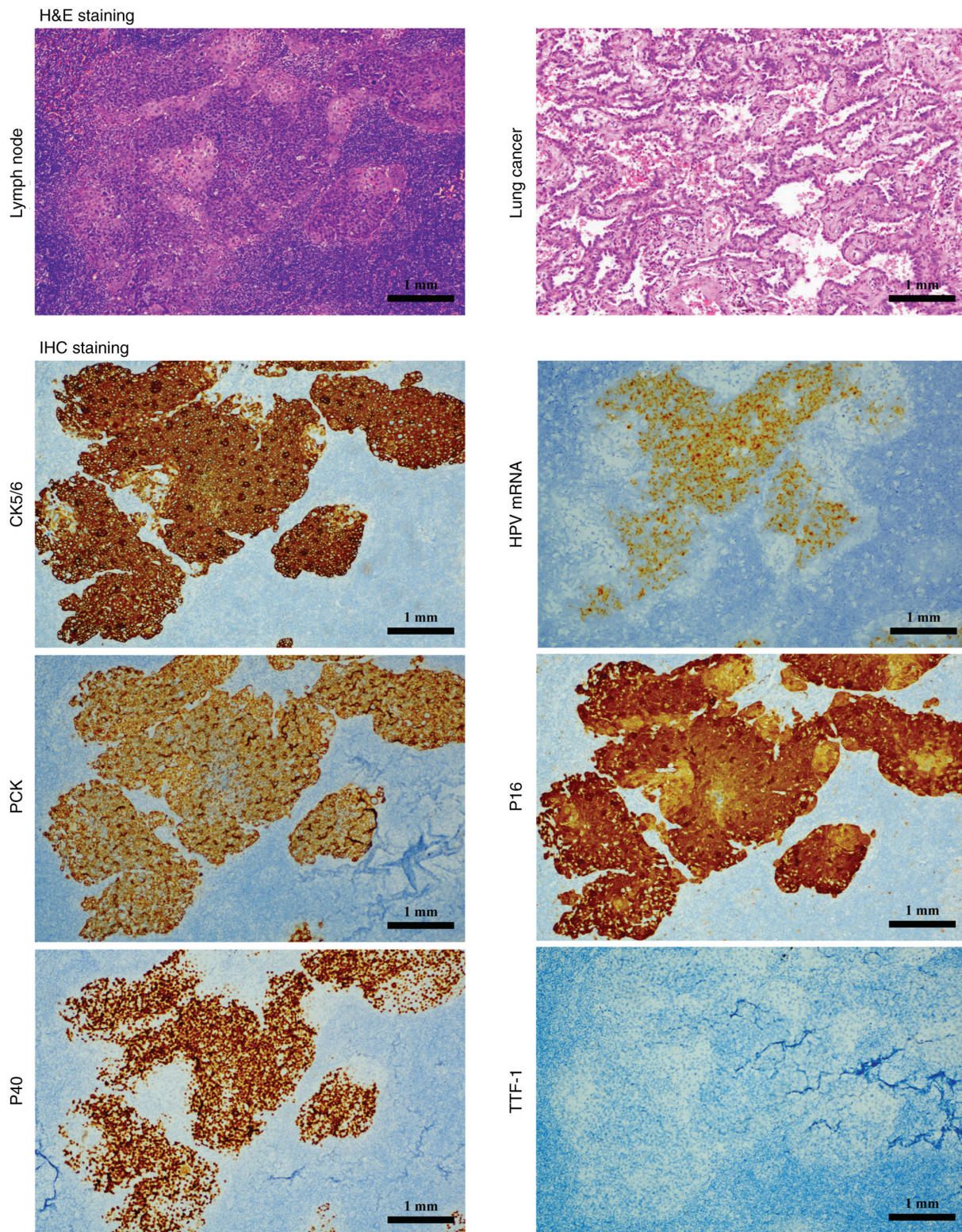


Figure 1. H&E staining and immunohistochemical staining. H&E staining confirmed that the histological types in the lymph node and lung tumor were different. The positive staining of PCK suggested the presence of abnormal epithelial components in the lymph nodes. The positivity of CK5/6 and P40, as well as the negativity of TTF-1, indicated that the lymph nodes contained metastatic squamous cell carcinoma. The positivity of P16 suggested abnormal proliferation of cells due to persistent HPV infection, leading to upregulation of P16, which can be used as a marker for cervical lesions. The positive result of HPV-mRNA *in situ* hybridization suggested that this squamous cell carcinoma was related to HPV infection. CK, cytokeratin; H&E, hematoxylin and eosin; HPV, human papillomavirus; PCK, pan CK; TTF-1, thyroid transcription factor-1.

(HPV16, 18, 26, 31, 33, 35, 39, 45, 51, 52, 53, 56, 58, 59, 66, 68, 73 and 82) (14). The lymph nodes tissue was excised and immersed in 10% formalin at room temperature for 24 h for

fixation, followed by dehydration in alcohol of increasing concentrations. Subsequently, the tissue was placed in xylene and embedded in paraffin wax; the embedded wax block was

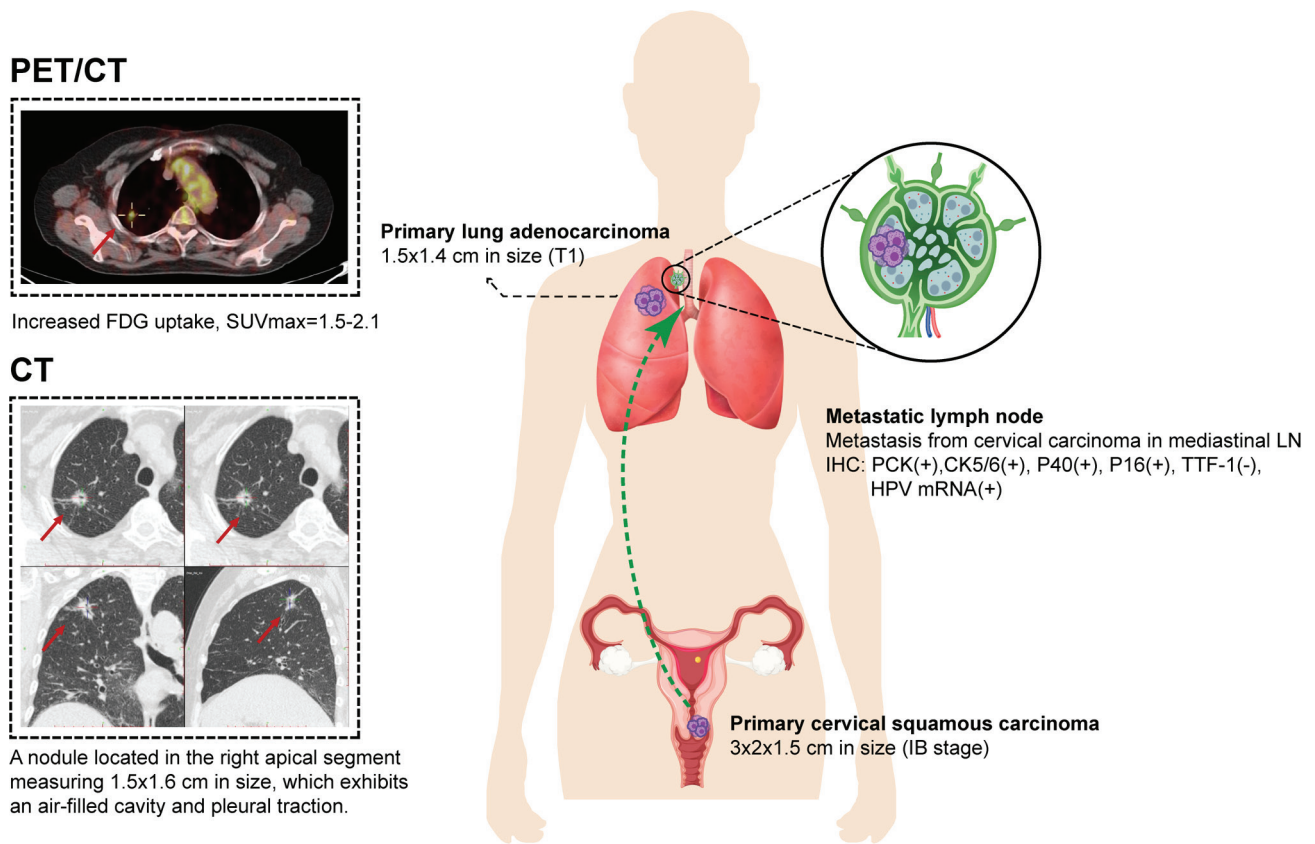


Figure 2. Cervical cancer metastasis pathway and preoperative PET/CT. The patient underwent radical resection of cervical cancer in 2018, and was diagnosed with stage IB cervical squamous cell carcinoma by postoperative pathology. In 2020, a nodule in the right upper lung was found. Preoperative PET/CT showed nodules of soft tissue density with a visible cavity and abnormal FDG uptake in the apical segment of the right upper lobe, which was considered to be a malignant tumor, and there were no obviously enlarged LNs in the mediastinum. At the same time, no signs of malignant tumor recurrence were found in the uterus and bilateral adnexa, and the pathological diagnosis of an invasive adenocarcinoma was confirmed after right upper lobectomy. CT, computed tomography; CK, cytokeratin; FDG, fluorodeoxyglucose; HPV, human papillomavirus; IHC, immunohistochemistry; LN, lymph node; PET, positron emission tomography; SUVmax, maximum standardized uptake value; TTF-1, thyroid transcription factor-1.

fixed on a microtome and sliced into 4- μ m sections. These sections were dewaxed, followed by the addition of pepsin and heat treatment at 40°C. Each slide was then incubated with ~50 μ l probe, followed by incubation with Amplification (Amp) 1 (pre-amplifier step) for 30 min at 40°C, Amp2 (signal enhancer step) for 15 min at 40°C, Amp3 (amplifier step) for 30 min at 40°C, Amp4 (probe labeling step) for 15 min at 40°C, Amp5 for 30 min at 40°C and Amp6 for 15 min at 40°C (signal amplifications steps), before the formation of a brown insoluble product via HRP-catalyzed substrate reaction with DAB. All of the Amps were included in the kit. Finally, the slides were counterstained with hematoxylin. The results indicated that the SCC was associated with HPV infection (Fig. 1), confirming that the metastatic cancer originated from cervical cancer. Taking all factors into consideration, it was concluded that the pathological staging of the patient was IA2-stage lung adenocarcinoma combined with IVB-stage cervical cancer. A schematic diagram of the pathway of metastasis is shown in Fig. 2. Additionally, the PET/CT and CT images of the patient's lung mass are shown in Fig. 2.

Due to the rarity of this case, standardized treatment protocols are currently unavailable. Consequently, rigorous follow-ups have been conducted with the patient, including chest and whole abdomen contrast-enhanced CT scans every 3 months and PET/CT scans annually, to promptly detect any

new metastases. Additionally, multidisciplinary consultations have been organized to devise subsequent treatment for the patient. Following discussions with oncologists and gynecologists, it was recommended that the patient undergo systemic chemotherapy with paclitaxel and platinum, and external irradiation radiotherapy (dosage of 41.4 Gy in 23 fractions) according to the National Comprehensive Cancer Network guidelines (15). However, due to personal factors, the patient did not undergo any recommended adjuvant treatment. In summary, the patient underwent surgical dissection of the oligometastatic lymph node without any additional adjuvant treatment. During the 3-year continuous follow-up period following surgery, there has been no recurrence of the tumor or metastasis to other areas.

Discussion

The accurate identification of lymph node metastasis in preoperative images is important when selecting appropriate surgical methods for patients with lung cancer. Nevertheless, occult lymph node metastases are clinically observed in ~20% of cases (16). Consequently, intraoperative assessment of lymph node morphology and texture, coupled with the surgeon's experience, or more specifically, the utilization of intraoperative rapid freezing techniques, is imperative to

determine the presence of metastasis and guide final surgical decisions. However, a particular challenge emerges when dealing with patients who have a prior history of malignant tumors, especially when the initial primary tumor has already spread to the same regional lymph nodes where subsequent primary tumors tend to spread. As aforementioned, in the present case report, the patient presented with two consecutive independent early-stage primary tumors. Routine postoperative follow-up examinations and pre-operative evaluations did not reveal any signs of recurrence or distant metastasis; however, occult mediastinal lymph node involvement from cervical cancer was eventually detected. Retrospective studies have indicated that ~14% of early-stage cervical cancer cases exhibit lymph node metastasis (17), whereas para-aortic lymph node involvement ranges from 8.4 to 11.1% in stage IB (18). Moreover, mediastinal lymph node involvement from cervical cancer is even rarer than para-aortic lymph node involvement. For patients with lung cancer who have a concurrent history of other tumors, if it is found that there are lymph nodes that may be involved in metastasis during intraoperative exploration of the chest, in addition to performing a lobectomy instead of a segmentectomy, the clinician must also be alert to the source of the metastatic lymph nodes, especially when the previous tumor is still under follow-up and remains at risk of recurrence and metastasis. Currently, based on intraoperative frozen sections, it is possible to determine whether there is metastasis in the lymph nodes; however, the source of the metastasis cannot be determined.

PET/CT has a robust ability in identifying metastasis, operating on the principle of dynamic glucose metabolism at the lesion site (19). When a glucose-like substance labeled with 18F-FDG is administered as an imaging agent into the human body, the malignant tumor avidly accumulates this agent, resulting in an elevated uptake value. This elevation enables the deduction of the existence of metastasis. One clinical study showed that, although FDG-PET/CT is increasingly used to assess the presence or absence of metastases, FDG-PET/CT alone is insufficient to assess isolated mediastinal lymph nodes in patients with cervical cancer, with a false positive rate of 75% (20). Although PET/CT is an important tool for lymph node staging and assessment of distant metastases, particular caution is advisable in cases involving isolated mediastinal involvement. It is crucial to note that positive PET/CT results do not definitively indicate the presence of metastasis. There is currently insufficient evidence to support the assertion that negative PET/CT findings accurately predict the absence of mediastinal lymph node metastasis in patients with cervical cancer.

In addition to the lack of effective imaging evaluation tools, mediastinal lymph node metastasis of cervical cancer also lacks typical signs and symptoms. A previous case report has suggested that enlargement of mediastinal lymph nodes can lead to dysphagia, potentially indicating the presence of metastatic lesions following surgical treatment for cervical cancer (8). In summary, cervical cancer with mediastinal metastasis lacks distinctive signs, symptoms and clear imaging evidence, rendering diagnosis challenging. Furthermore, metastasis is uncommon in early-stage cervical cancer, making the detection of tumor recurrence particularly difficult, even with routine follow-ups. The conventional radiological assessment

has some limitations in detecting the presence of lymph node metastasis, including low specificity and accuracy (21-23); however, artificial intelligence may offer a potential solution to this challenge. Zhang *et al* (24) successfully developed a model that extracts radiomic and deep learning features from both intratumoral and peritumoral regions in cervical cancer. This model aims to predict early recurrence risk factors, and has been shown to achieve a maximum area under the curve value of 0.944, demonstrating its promising predictive capabilities (24). However, it is worth noting that this previous study was conducted retrospectively, and despite its promising predictive performance, further validation and confirmation of its reliability in actual clinical application are crucial. Moreover, studies have demonstrated an association between SCC antigen levels, the maximum SUV on PET/CT, and risk of recurrence. Elevated levels of both SCC antigen and maximum SUV of PET/CT may be indicative of a poorer prognosis and a heightened risk of recurrence (25,26). Additionally, colon cancer-associated transcript 2 has been implicated in lymph node metastasis in cervical cancer, serving as a predictor of adverse outcomes (27). In the future, the potential integration of artificial intelligence biomarkers with serological markers could provide a more comprehensive and precise foundation for clinical decision-making. However, despite these advances, pathology remains the gold standard, ensuring the accuracy and reliability of diagnosis.

According to the staging criteria established by the American Joint Committee on Cancer and the International Federation of Gynecology and Obstetrics (28,29), cervical cancer is classified as stage IVB when mediastinal lymph node metastasis is present, and the optimal treatment approach for these patients remains under exploration. Tewari *et al* (30) proposed that patients with metastatic cervical cancer can benefit from systemic chemotherapy with cisplatin and paclitaxel, along with bevacizumab. Furthermore, Gadducci *et al* (31) indicated that combination chemotherapy based on cisplatin can have a higher overall response rate than single agents. In addition, a meta-analysis has suggested that combined chemotherapy is generally more favored than single-agent treatment (32). However, some patients experience severe side effects from cisplatin. To mitigate these side effects, enhance safety and maintain efficacy, carboplatin may be considered as an alternative to cisplatin (33). Case reports have highlighted a potentially superior treatment regimen for patients with mediastinal oligometastasis. Bonilla *et al* (34) presented two rare cases, which provide some valuable insights for the treatment of mediastinal oligometastasis: One patient with stage IB cervical cancer presented with mediastinal metastasis and underwent mediastinal intensity-modulated radiotherapy with a total dose of 60 Gy (2.0 Gy/fraction), along with weekly intravenous cisplatin at a dose of 40 mg/ml for 6 weeks. Notably, the patient demonstrated a favorable prognosis and remained alive until June 2020. The second case involved another patient who initially received 6 weeks of chemotherapy with carboplatin and paclitaxel, followed by mediastinal intensity-modulated radiation therapy with a dosage of 60 Gy and cisplatin administration; finally, the patient achieved a complete response (34). Although these are isolated case reports, they provide valuable insights for clinical practice (32). A clinical study conducted in Korea

on oligometastatic cervical cancer revealed that stereotactic body radiotherapy exerted a positive impact on patients, with a disease progression-free survival (DPFS) time of 14.3 months. Specifically, the 2- and 5-year DPFS rates were 42.4 and 34.4%, respectively, whereas the median overall survival (OS) time was 32.7 months. Notably, the 2-year OS rate stood at 57.5%, surpassing the 5-year OS rate of 32.9%. Given the rarity of mediastinal oligometastasis, the associated findings may not conclusively demonstrate the efficacy of radiotherapy combined with or without chemotherapy. Nevertheless, they hold significant reference value for clinical practice (35).

Surgical management may be considered a viable treatment option for metastatic tumors located in the mediastinum. Kanzaki *et al* (36) described two cases where patients with early-stage clear cell renal cell carcinoma (RCC) underwent radical nephrectomy. Subsequently, during the postoperative follow-up period, both patients were diagnosed with mediastinal masses, which were successfully resected through a minimally invasive thoracotomy approach. Intraoperative rapid pathological examination confirmed that the metastases were derived from clear cell RCC. Notably, neither patient received adjuvant therapy following surgery. One of the patients developed pulmonary and lymphatic metastases 5 years after the initial procedure but survived until the last follow-up, having responded well to treatment with interferon α (34). Furthermore, Lin *et al* (37) presented a case study of a patient with early-stage RCC who subsequently developed posterior mediastinal lymphatic metastasis following radical nephrectomy. The patient was diagnosed with Castleman's disease and underwent VATS. Postoperative pathology confirmed that the metastasis originated from clear cell RCC. The patient did not receive any treatment after surgery, and remained free of recurrence and metastasis at the 10-month follow-up (37). These studies indicate that surgical management of isolated mediastinal lymph node metastases arising from clear cell RCC may offer a potentially effective treatment option. However, Mori *et al* (38) reported on a unique case involving a patient with lung squamous cell carcinoma who also suffered from mediastinal lymph node metastasis from RCC. Notably, despite surgery, the patient developed metastasis to the left inferior paratracheal lymph node after 4 months, necessitating radiotherapy (60 Gy) and immunotherapy. Despite this, the patient maintained a good condition at the 10-month follow-up. This case underscores that surgical resection alone may not be sufficient in certain instances, and the employment of adjunctive therapies may be necessary to optimize patient survival outcomes (38). The present case is akin to the aforementioned studies, featuring isolated mediastinal lymph node metastasis in early-stage cancer. Nevertheless, the precise effectiveness of surgical treatment for mediastinal metastasis stemming from cervical cancer remains an area requiring further investigation and elucidation.

The immune system serves a critical role in combating cancer, as tumors often manipulate the immune system to evade detection. Immune therapy has transformed cancer treatment by repairing the immune-escape defect. Broadly defined, immune therapy encompasses active and passive immunization strategies that directly target tumors based on immune mechanisms. Immune checkpoint therapy has made revolutionary advances in cancer treatment,

fundamentally changing the way cancer is viewed and treated. Additionally, the immune system can impact cancer treatment outcomes (39). Specifically, in the present case report, a patient underwent radical hysterectomy for cervical cancer, and pathological analysis revealed early-stage cervical cancer with no signs of recurrence detected after surgery. Skip metastasis for IB cervical cancer is rare; however, in this case, the patient developed metastasis in upper mediastinal lymph nodes 2 years later. Hence, it may be hypothesized that secondary malignancies can potentially exert an influence on the immune system, altering the immune microenvironment and potentially triggering the reactivation of the previously suppressed primary tumor. This reactivation can ultimately lead to recurrence or metastasis. Tumor cells are well-known modulators of immune activity, and macrophages, for instance, can adapt to different environments, primarily transforming into M1 or M2 subsets. The majority of macrophages found within tumor tissues belong to the M2 subtype, which tends to suppress immune responses and facilitate tumor growth. Tumor-associated macrophages, a subtype of M2 macrophages, have been demonstrated to secrete cytokines, such as IL-10, PGE2 and TGF β , participating in tumor immune evasion and various biological activities (40). Nevertheless, it is important to note that these findings represent a preliminary hypothesis, and further rigorous experiments are required to validate and consolidate the understanding of these complex interactions.

The present case report exhibits some limitations. Firstly, the patient solely underwent surgical resection without receiving any adjuvant therapy, which undoubtedly affects the comprehensiveness and reliability of the treatment outcomes. Secondly, given that there is only one case described, its use in the guidance for the treatment of similar patients may have certain constraints.

In conclusion, the present case report describes a patient who was diagnosed with a primary lung adenocarcinoma that was accompanied by mediastinal lymph node metastasis, which originated from early-stage cervical squamous cell carcinoma. For patients with lung cancer and concurrent malignancies, metastatic lymph nodes discovered during surgery may originate from the previous malignancy. Surgical management of oligometastatic lymph nodes in the mediastinum can be a potential therapeutic option, albeit one that may necessitate the integration of adjuvant treatment modalities as warranted by the individual case.

Acknowledgements

Not applicable.

Funding

This work was supported by the Grant of National Natural Science Foundation of China (grant no. 82303353).

Availability of data and materials

The data generated in the present study may be requested from the corresponding author.

Authors' contributions

CZ and QFH conceived and designed the study. GCY, XJW and YH collected all relevant clinical, laboratory and imaging data. YDL interpreted all relevant data in the present case. CZ, QFH, GCY and YDL prepared the manuscript. CZ, QFH and YDL confirm the authenticity of all the raw data. All authors read and approved the final version of the manuscript.

Ethics approval and consent to participate

Not applicable.

Patient consent for publication

Written informed consent was obtained from the patient for publication of this case report and the accompanying images.

Competing interests

The authors declare that they have no competing interests.

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