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CASE REPORT

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Pathologic complete response after neoadjuvant tislelizumab and chemotherapy for Pancoast tumor: A case report

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Abstract

A 60-year-old man was hospitalized because of numbness and weakness in the right upper limb. Magnetic resonance imaging revealed a large mass in the right upper lobe invading the right eighth cervical and first thoracic nerve root. Biopsy pathology confirmed primary lung adenocarcinoma with a clinical stage of cT4N0M0 IIIA, negative for anaplastic lymphoma kinase fusion gene and epidermal growth factor receptor mutations but positive for programmed death ligand 1 (3%). Neoadjuvant tislelizumab and chemotherapy were offered to this patient with Pancoast tumor, and tumor shrinkage of 71% was achieved. After the operation, surgical pathology indicated pathologic complete response (pCR). Circulating tumor cells testing was negative after the first adjuvant treatment. In this case, we provide real-world evidence of encouraging pCR with neoadjuvant tislelizumab and chemotherapy for a patient with Pancoast tumor.

KEYWORDS
immunotherapy, neoadjuvant, Pancoast tumor, pCR

INTRODUCTION

Inhibiting programmed death 1 (PD-1) or its ligand, programmed death ligand 1 (PD-L1), has revolutionized the treatment landscape of advanced nonsmall-cell lung cancer (NSCLC) and is currently one of the criteria for first-line treatment; an overall survival of 16.7 to 20.0 months is achieved by using pembrolizumab.[1,2] Furthermore, consolidation therapy with durvalumab after definitive chemoradiotherapy has shown better survival in patients with unresectable stage III NSCLC.[3] Importantly, neoadjuvant immunotherapy clinical trials for resectable stage IB–IIIA NSCLC are underway. One of the advantages is that they can release neoantigens from dying tumor cells and stimulate the priming of neoantigen-specific T cells in the tumor before primary tumor resection.[4]

Here, we provided a case combining tislelizumab and chemotherapy as neoadjuvant treatment for Pancoast tumor and a pathologic complete response (pCR) was achieved. To our knowledge, there are few studies on neoadjuvant immunotherapy for this special population.

CASE REPORT

A 60-year-old man who was a 40 pack/year smoker was hospitalized due to complaints of progressive numbness and

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weakness in the right upper limb for 4 months. An enhanced magnetic resonance imaging scan found a large mass with a diameter of 52 mm located in the right upper lobe of the lung, which invaded the right eighth cervical and first thoracic nerve root (Figure 1). Needle biopsy was performed in the tumor in the right upper lobe of the lung, and pathologic evaluation confirmed primary lung adenocarcinoma (immunohistochemistry [IHC] results: CK7+, NapsinA+, P63-, P40-, TTF-1-, CgA-, Syn-, [Figure 2, Supplementary Methods]), with a clinical stage of cT4N0M0 IIIA. In our center, next-generation sequencing (NGS) and PD-L1 testing require 1 week. The patient's numbness and weakness symptoms in the right upper limb were very serious. After acquiring informed consent from the patient, we offered pemetrexed (750 mg) on day 1 and nedaplatin (35 mg) on days 1–3 for one cycle. Then, the NGS (Supplementary Methods, Table S1 and S2, Figure S1) indicated that the epidermal growth factor receptor (EGFR) and anaplastic lymphoma kinase (ALK) status was wild type, and the proportion of PD-L1 in tumor cells (TPS) was 3%. We offered tislelizumab (200 mg on day 1) and chemotherapy (pemetrexed [750 mg] on day 1 and nedaplatin [35 mg] on days 1–3) for the second and third neoadjuvant cycles. A partial response was achieved with a tumor shrinkage of 71%, and the TNM stage was downstaged as ypT1bN0M0 IA2. Only grade 1–2 fatigue and nausea were observed during neoadjuvant treatment (Figure 1).

Right upper lobectomy and systemic lymphadenectomy were successfully performed after three neoadjuvant cycles. Surgical pathology evaluation indicated no residual tumor, and pCR was achieved (IHC results: CK- [Figure 2]). The patient was discharged 3 days after surgery without any serious in-hospital complications. After the operation, two cycles of tislelizumab (200 mg on day 1) and chemotherapy (pemetrexed [750 mg] on day 1) were offered. We performed circulating tumor cells (CTCs) testing since the third neoadjuvant treatment, which was a potential predictive marker of survival and relapse of lung cancer.[5] After the first adjuvant treatment, the CTC testing was negative (Figure 1).

DISCUSSION

We first reported a clinically successful case involving neoadjuvant tislelizumab and chemotherapy for Pancoast tumor whose current standard treatment is concurrent chemoradiotherapy.[6,7] A previous study indicated that perioperative chemotherapy is associated with a survival benefit that is only 5–5.4% higher than that with surgery alone,[8,9] and the rate of grade 3–5 toxicities is more than 60%.[10] Moreover, the proportion of patients with NSCLC who have a pCR is low, and

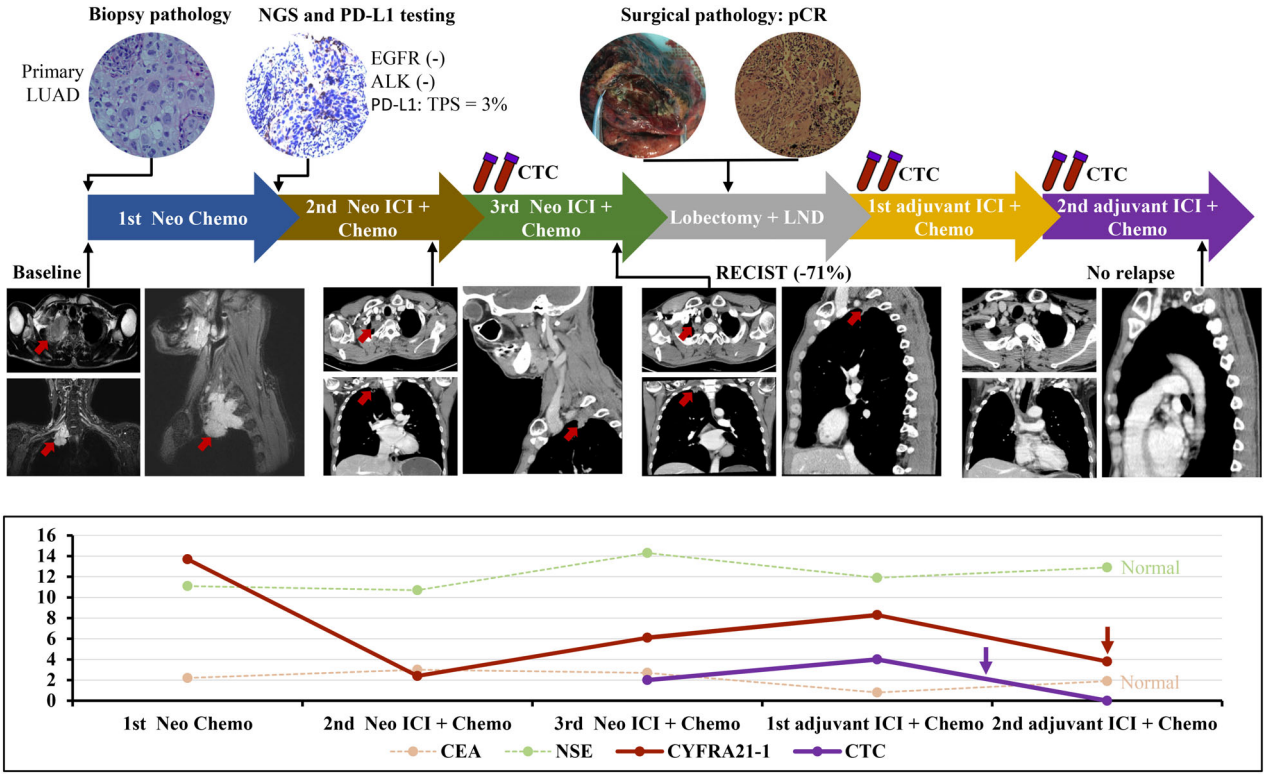

FIGURE 1 The process of treatment in this case, including dynamic radiological and pathological evaluation, NGS and PD-L1 testing, related tumor indicators, and circulating tumor cells testing. ALK, anaplastic lymphoma kinase; CEA, carcino-embryonic antigen; chemo, chemotherapy; CTC, circulating tumor cells; CYFRA21-1, cytokeratin fragment antigen 21–1; EGFR, epidermal growth factor receptor; ICI, immune checkpoint inhibitors; LUAD, lung adenocarcinoma; LND, lymph node dissection; NGS, next-generation sequencing; NSE, neuron-specific enolase; pCR, pathologic complete response; PD-L1, programmed death ligand 1; RECIST, response evaluation criteria in solid tumors

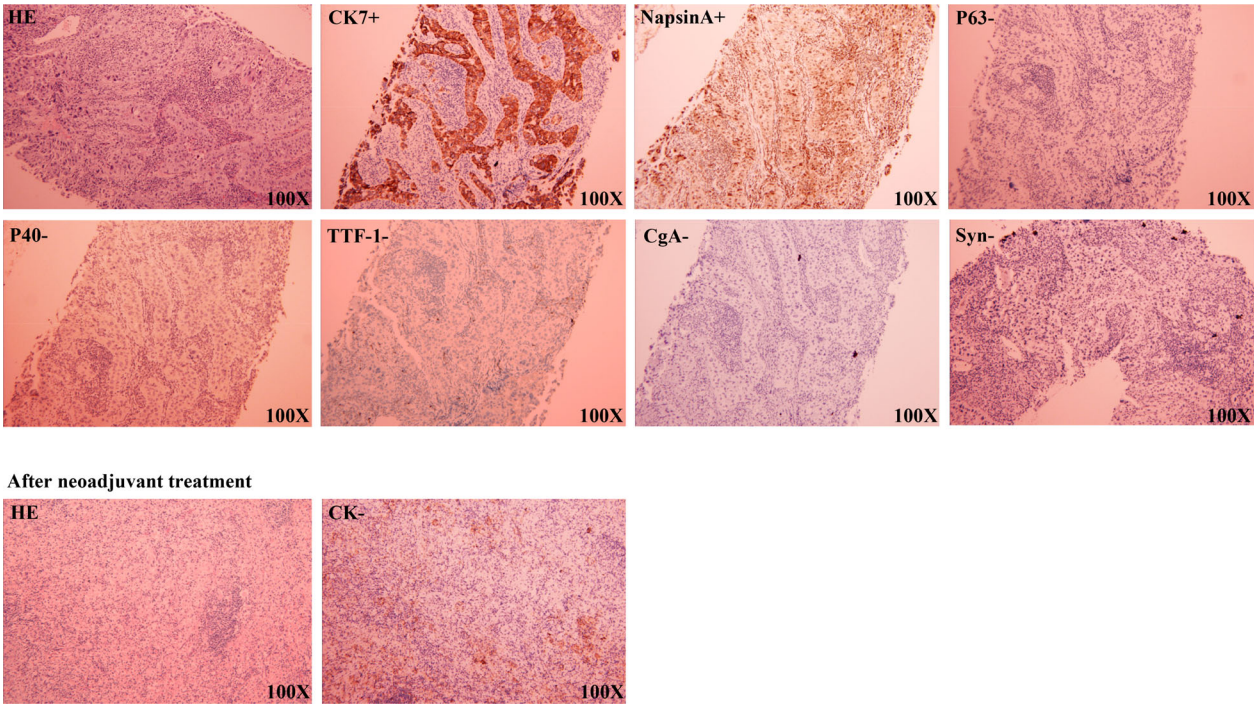

FIGURE 2 Integrated assessment for pathological diagnosis before and after neoadjuvant treatment including CK7, NapsinA, P63, P40, TTF-1, CgA, Syn, CK. HE, hematoxylin, and eosin

major pathological response (MPR) is proposed as a surrogate endpoint in early-stage NSCLC.[11,12] In a study of neoadjuvant chemotherapy for nonsquamous NSCLC, only 27% of tumors achieved an MPR to therapy, and such responses were associated with long-term survival.[13] However, nivolumab as neoadjuvant treatment showed that 45% of patients had an MPR and 15% of patients had a pCR.[14] Recently, a single arm phase 2 trial combining neoadjuvant atezolizumab with chemotherapy showed that 57% of patients had an MPR.[15] Tislelizumab is considered to have a higher affinity for PD-1 than pembrolizumab and nivolumab,[16] and demonstrated good tolerance as a first-line treatment for advanced lung cancer in Chinese patients.[17] Tislelizumab may be one option of immune checkpoint inhibitors as neoadjuvant treatment for resectable NSCLC.

However, there are two issues in the real world that need to be discussed: whether one cycle of neoadjuvant chemotherapy alone could be offered in the case where a patient has severe symptoms but the results of NGS and PD-L1 testing are not available in time, and whether postoperative adjuvant treatment should first include immunotherapy plus monochemotherapy to better reduce minimal residual disease and then immunotherapy alone for maintenance. Collectively, we provided real-world evidence of encouraging pCR for neoadjuvant tislelizumab and chemotherapy for a patient with Pancoast tumor, but further study is needed to clarify its clinical implications.

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CONFLICT OF INTEREST

All authors indicated no conflicts of interest.

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SUPPORTING INFORMATION

Additional supporting information may be found online in the Supporting Information section at the end of this article.

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