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Letter to the Editor

Can Pirfenidone and Nintedanib Be Alternative Treatment Options for Radiation Pneumonitis?

Pirfenidon ve Nintedanib Radyasyon Pnömonisi için Alternatif Tedavi Seçenekleri Olabilir mi?

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Dear Editor,

Radiation-induced pneumonitis (RP) is an early event observed in most patients exposed to radiation, typically occurring within 2-4 months after treatment and potentially leading to fibrosis[1]. While clinical observation is recommended for mild symptoms of radiation pneumonitis, systemic steroid therapy is advised for symptomatic patients, provided that lung infection is excluded[2]. In cases where there is no response to systemic steroid therapy, treatments such as azathioprine, cyclosporine, amifostine, and pentoxifylline can be attempted. We achieved near-complete improvement in symptoms, high-resolution computed tomography (HRCT) images, and pulmonary function test parameters, in two patients who developed radiation pneumonitis following radiotherapy (RT) for breast cancer and lung cancer by administering nintedanib and pirfenidone treatments.

Patient 1: A 64-year-old patient with squamous cell carcinoma of the lung had a primary lesion in the upper lobe of the left lung. After six courses of chemotherapy, a complete response was not achieved, so RT was administered for 20 days. Post-RT, the patient complained of cough and dyspnea, and thoracic CT revealed radiation pneumonitis. Despite treatment with a steroid dose of 1 mg/kg/day, there was no regression or improvement in symptoms. By the end of the first month, the prednisolone dose was reduced to 16 mg/day, and additionally, oral nintedanib 150 mg twice daily was initiated. After the commencement of nintedanib therapy, there was a significant improvement in cough and dyspnea. The prednisolone dose was tapered and eventually discontinued. Nintedanib treatment was discontinued after two months. Upon evaluation with control HRCT at the end of the third month, almost complete regression of the parenchymal changes was observed compared to the initial treatment (Figure 1). The improvement in pulmonary function parameters is shown in Table 1.

Patient 2: A 68-year-old female patient diagnosed with left breast cancer had been started on 1 mg/kg/day steroid therapy due to paclitaxel-induced lung injury during chemotherapy. After the symptoms related to

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the drug-induced lung injury regressed, RT was initiated while the patient was on 16 mg/day prednisolone therapy. Upon the detection of an increase in symptoms following RT, HRCT revealed findings of radiation pneumonitis in both lungs, more pronounced on the left side. Pirfenidone at a dose of 4x600 mg was added to the prednisolone therapy. After two months of treatment, control HRCT revealed that the parenchymal lesions had nearly completely resolved, corresponding with a reduction in symptoms (Figure 2). The improvement in pulmonary function parameters is shown in Table 1.

A murine study with the multi-kinase inhibitor nintedanib, described as a treatment to prevent RP and reduce lung fibrosis incidence, nintedanib's efficacy in reducing interstitial edema, interstitial and perivascular fibrosis, inflammation, and vasculitis[3]. As for pirfenidone, there is only one subjective study available in literature, which reports a reduction in symptoms[1]. We did not find any literature data indicating improvements in radiological and pulmonary function parameters with pirfenidone treatment in RP. Based on our review of the literature, we are presenting real-life data for the first time, demonstrating that nintedanib and pirfenidone are effective treatment options in the management of RP.

Table 1. FVC and DLCO parameters of the patients before and after treatment.

	Pre-treatment	Post-treatment
Patient 1		
FVC Liter (%)	1.90 (58)	2.30 (72)
DLCO (%)	72	86
Patient 2		
FVC Liter (%)	1.38 (49)	2.12 (76)
DLCO (%)	80	119

FCV: Forced vital capacity, DLCO: Diffusing lung capacity for carbon monoxide

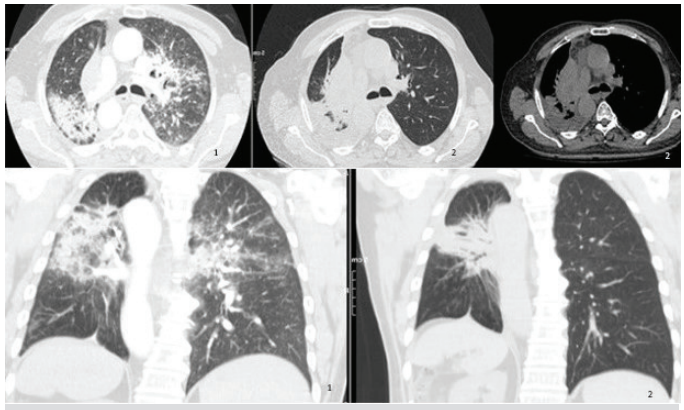

Figure 1. Patient diagnosed with squamous cell carcinoma of the left lung. Significant improvement in the parenchyma is observed following the addition of nintedanib to prednisolone therapy post-RT.

RT: Radiotherapy

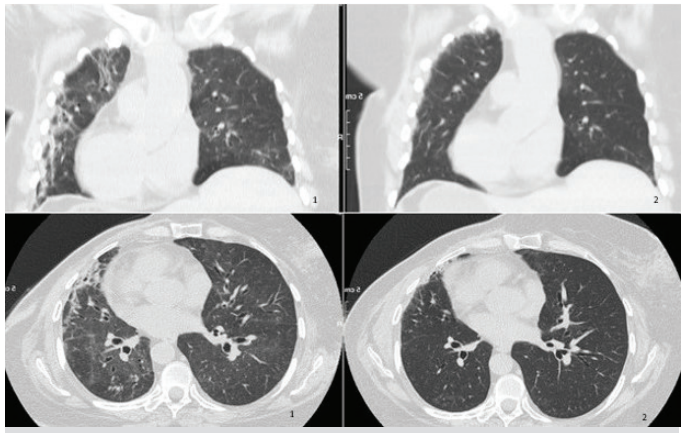

Figure 2. Patient diagnosed with left breast cancer. Improvement in lung parenchyma is observed following pirfenidone therapy in a patient who developed radiation pneumonitis while receiving steroid therapy.

Ethics

Author Contributions

Surgical and Medical Practices: H.C., M.C., Concept: H.C., N.S., Design: H.C., M.C., F.E., Data Collection and/or Processing: H.C., Analysis and/or Interpretation: M.Y.Ş., M.C., Literature Search: H.C., M.Y.Ş., Writing: H.C., M.C.

Conflict of Interest: The authors have no conflict of interest to declare.

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