Remission of Newly Diagnosed Immune Thrombocytopenia After Lung Cancer Resection

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Secondary immune thrombocytopenia is a rare paraneoplastic syndrome of lung cancer. We report a case of pulmonary pleomorphic carcinoma with newly diagnosed secondary immune thrombocytopenia. On referral, the patient’s complete blood cell count was normal; however, it showed marked thrombocytopenia after 1 month. Blood chemistry and bone marrow puncture showed normal findings. We speculated that he had immune thrombocytopenia associated with the lung cancer and planned lung resection. Sleeve middle and lower lobectomy was successfully performed with preoperative intravenous immunoglobulin and intraoperative platelet transfusion. His platelet count was restored and maintained a normal level at 8 months after the operation.


Secondary immune thrombocytopenia (ITP) is a rare paraneoplastic syndrome, occurring with a variety of cancers, including lung, breast, ovary, renal, and prostate cancers [1]. ITP is divided into three categories based on the phase of the onset of the disease. The term “newly diagnosed ITP” is used for all cases in which patients receive diagnoses of ITP. The term “persistent ITP” is introduced for patients with ITP lasting between 3 and 12 months from diagnosis. The term “chronic ITP” indicates that the disease has lasted for more than 12 months [2]. The relationship between the pathogenesis of ITP and lung cancer has not been clearly understood. In some cases, ITP simply coexists with lung cancer, and in other cases, ITP develops in association with lung cancer. Profound ITP with severe thrombocytopenia usually restricts surgical treatment or chemotherapy for lung cancer, and such patients require preceding treatment, including high doses of corticosteroids, intravenous immunoglobulin (IVIg), and platelet transfusion. We present a case of newly diagnosed secondary ITP associated with lung cancer. The patient showed rapid restoration of normal platelet count and complete remission of ITP after lung resection.

A 58-year-old man with an abnormal lung shadow on the right hilum was referred to our center. Computed tomography (CT) on referral revealed a mass in the right intermediate bronchus with intrapulmonary lymph node enlargement (Fig 1). Bronchoscopy revealed a polyp protruding from the right intermediate bronchus. Histopathologic examination of the biopsy specimen showed pulmonary pleomorphic carcinoma. The clinical stage of the patient was judged to be T2bN1M0 Stage II B. The results of complete blood cell count and routine biochemistry were within normal limits, with a platelet count of 29.2 × 10^4/μL on referral. One month later he was admitted for the operation. Purpura was observed on his knee on physical examination. Chest CT on admission revealed no remarkable change of the mass in the right lung and intrapulmonary lymph node. However, his complete blood count showed marked thrombocytopenia, with a platelet count of 4.2 × 10^4/μL, whereas the other blood cell count, routine biochemistry, and coagulation capacity showed normal findings. Platelet-associated immunoglobulin G (PAIgG) in serum was slightly elevated to 49 ng/10^7 cells (normal range, <46 ng/10^7 cells), and the bone marrow had a normal appearance on cytologic and pathologic examination. He did not have an evident viral infection during this period. We speculated that he had newly diagnosed secondary ITP associated with lung cancer. A 5-day course of IVIg (400 mg/kg/day) was performed 1 week before the operation without side effects. His platelet count rose to 7.1 × 10^4/μL after the IVIg was given.

Sleeve middle and lower lobectomy followed by lymph node dissection was performed. Blood loss was 490 mL, and the platelet count dropped to 4.8 × 10^4/μL during the operation, then platelet transfusion was performed. The patient showed rapid restoration of normal platelet count and complete remission of ITP after lung resection. The results of complete blood cell count and routine biochemistry were within normal limits, with a platelet count of 29.2 × 10^4/μL on referral. One month later he was admitted for the operation. Purpura was observed on his knee on physical examination. Chest CT on admission revealed no remarkable change of the mass in the right lung and intrapulmonary lymph node. However, his complete blood count showed marked thrombocytopenia, with a platelet count of 4.2 × 10^4/μL, whereas the other blood cell count, routine biochemistry, and coagulation capacity showed normal findings. Platelet-associated immunoglobulin G (PAIgG) in serum was slightly elevated to 49 ng/10^7 cells (normal range, <46 ng/10^7 cells), and the bone marrow had a normal appearance on cytologic and pathologic examination. He did not have an evident viral infection during this period. We speculated that he had newly diagnosed secondary ITP associated with lung cancer. A 5-day course of IVIg (400 mg/kg/day) was performed 1 week before the operation without side effects. His platelet count rose to 7.1 × 10^4/μL after the IVIg was given.

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Fig 1. Computed tomography scan of the chest showing a mass occupying the intermediate bronchus. The arrow indicates the tumor.
platelet count after the operation rose to \(12.2 \times 10^4/\mu L\) and gradually improved to a normal value (Fig 2). PAIgG decreased to 35 ng/10^7 cells on day 13 after the operation. Histopathologic examination of the surgically removed specimen revealed the pathologic stage to be T2bN0M0 Stage I B. He was discharged without complications 25 days after the operation. He received oral tegafur-uracil as an adjuvant chemotherapy. Eight months later, he had no recurrence of the lung cancer and had a normal platelet count.

**Comment**

Immune thrombocytopenia is an autoimmune disease and develops as a result of increased platelet destruction and insufficient platelet production. ITP is a typical autoimmune phenomenon associated with lymphomas [3]; conversely, secondary ITP associated with a solid cancer is rare. It is also true that only a few patients have shown complete remission of ITP after treatment for solid cancers [1]. To the best of our knowledge, among the 68 published cases of secondary ITP associated with solid cancers, 15 describe the development of ITP combined with lung cancer. Histopathologic diagnoses in those 15 published cases consist of 4 adenocarcinomas, 3 squamous cell carcinomas, 3 small cell carcinomas, 1 pleomorphic carcinoma, and 4 non-small cell lung carcinomas without further information, indicating that the development of secondary ITP is independent of the histopathology of lung cancer. Among these 15 published cases, only 3 patients showed partial remission or transient complete remission after operation [1, 4, 5]. Sustained complete remission is defined as complete remission of ITP for more than 6 months without steroids [1]. In the present case, definitive improvement of newly diagnosed ITP was observed after resection of the lung cancer. Moreover, complete remission of ITP was sustained for 8 months after the operation, which has so far been reported only rarely. Although it is well known that onconeural antibodies result in immune-mediated paraneoplastic syndromes [6], the relationship between paraneoplastic antibody production against platelets and lung cancer is elusive. The present case, however, indicates at least the close association between the cause of ITP and lung cancer.

Patients with ITP are predisposed to an increased risk of complication after operation as a result of thrombocytopenia and consecutive bleeding. Various treatment strategies for ITP have been proposed, including immunosuppression, splenectomy, IVIg, and eradication of *Helicobacter pylori* [7]. Rapid and adequate restoration of platelet count with minimal side effects is desired in the pretreatment for lung cancer resection. In the present case, IVIg at a dose of 400 mg/kg/day for 5 consecutive days restored the patient’s platelet count to \(7.1 \times 10^4/\mu L\) from the baseline of \(4.2 \times 10^4/\mu L\) without the side effects described in previous reports [8]. The patient safely underwent lung resection without significant bleeding, having been given a platelet transfusion during the operation.

In conclusion, we present a rare case of newly diagnosed secondary ITP associated with pulmonary pleomorphic carcinoma in which the patient showed prompt restoration of platelet count and long-lasting complete remission of ITP after lung cancer resection. This rare case illustrates a unique relationship between primary lung cancer and the development of newly diagnosed ITP. It is also advocated that IVIg and platelet transfusion are effective treatments for ITP in preventing life-threatening bleeding during and after lung resection.
References