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Primary pulmonary collision tumor comprising squamous cell carcinoma and mucosa-associated lymphoid tissue lymphoma

To the Editor,

Primary pulmonary collision tumor is rare, particularly that comprising carcinoma and lymphoma. Here, we report a case of primary pulmonary collision tumor comprising squamous cell carcinoma (SCC) and mucosa-associated lymphoid tissue (MALT) lymphoma.

1. Case presentation

A 69-year-old man with a 50-pack-year smoking history presented with a chief complaint of productive cough. He is on confirmed complete remission for 5 years of gastric MALT lymphoma after radiation therapy. Chest radiography showed a nodule in the right lower lung field, and computed tomography (CT) scan showed a nodular lesion in the lower lobe of the right lung (Fig. 1A). Except for the serum concentration of carcinoembryonic antigen (slightly increased at 6.7 ng/ml), other tumor markers were within normal range. Subsequently, he underwent bronchoscopy, and the tumor was finally diagnosed as primary lung SCC, cT2aN0M0, stage IB.

He underwent a right lower lobectomy with lymph node dissection. Histopathologic examination revealed that the tumor was composed of two different histopathologic types, namely, SCC and MALT lymphoma (Fig. 1B, C, and D). The MALT lymphoma was positive for B-cell-specific antigen CD20 expression (Fig. 1D); in addition, the tumor was positive for CD79a and BCL6 and negative for CD10, CD5, and Cyclin D1. Clonality of the MALT lymphoma cells was confirmed by polymerase chain reaction-based analysis of immunoglobulin heavy chain gene rearrangements (Fig. 2). Other cytogenetic examination of the tumor was not performed. The MALT lymphoma invaded the epithelial structures of the bronchioles. Chronic bronchitis/bronchiolitis and

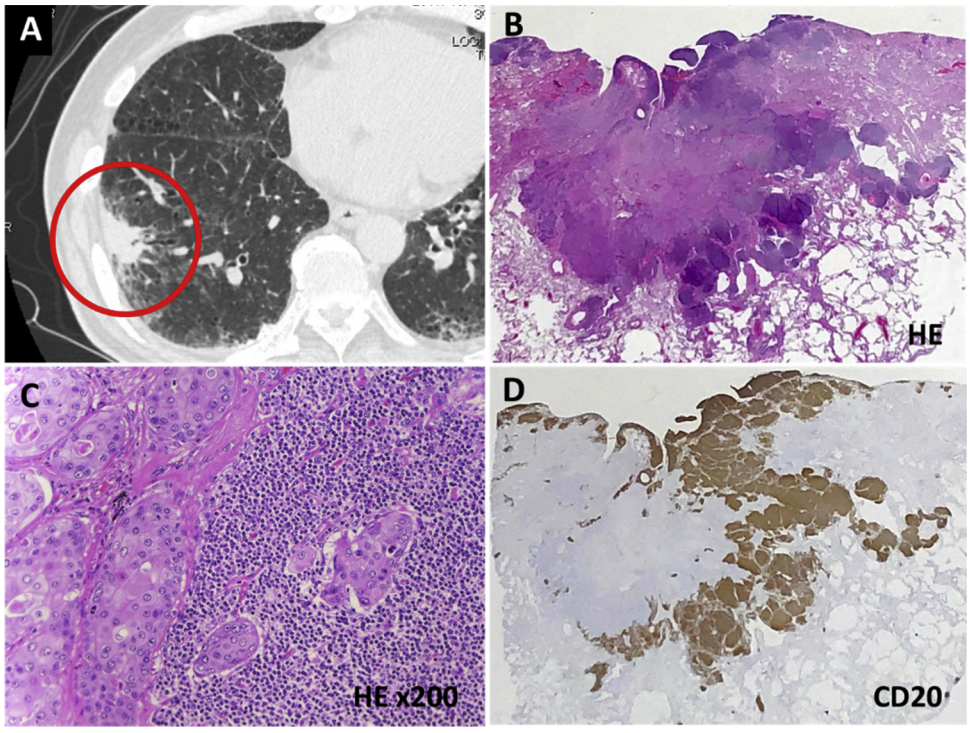

Fig. 1. (A) Computed tomography scan showed a nodule in the lower lobe of the right lung (circle). (B) Hematoxylin and eosin staining of the resected specimen (macroscopic view). The tumor existed in the subpleural region with pleural invasion. (C) Histopathological findings of the resected tumor specimen showed both squamous cell carcinoma and mucosa-associated lymphoid tissue (MALT) lymphoma (hematoxylin and eosin stain, magnification ×200). (D) Immunohistochemical staining of the specimen with anti-CD20 antibody. The MALT lymphoma area was visible clearly (macroscopic view).

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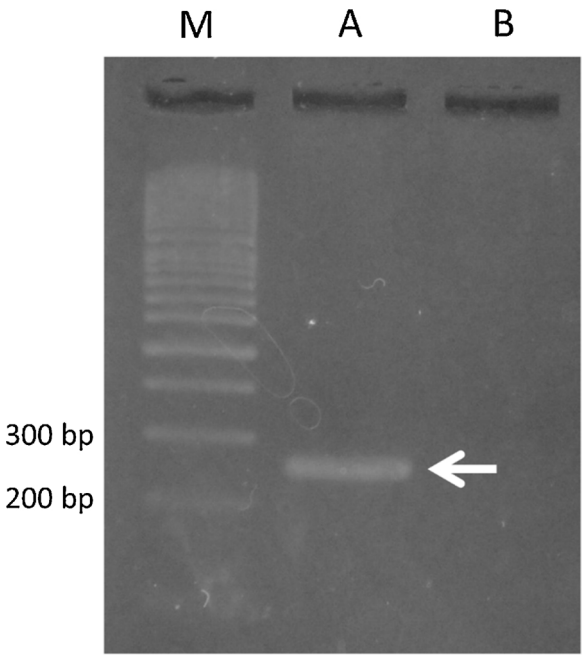

Fig. 2. Polymerase chain reaction-based clonality analysis of immunoglobulin heavy chain gene rearrangements in the present pulmonary MALT lymphoma. Lane A showed a clonal band (arrow). Lane M: DNA size marker. Lane B: negative control.

emphysema were observed in the lung around the tumor. Right hilar lymph node metastasis of SCC was also detected. In addition, carcinoma cell was detected from intraoperative lavage fluid of the thoracic cavity; accordingly, pleural dissemination of SCC was diagnosed. Finally, the tumor was diagnosed as collision tumor consisting of SCC (pT2aN1M1a, stage IVA) and MALT lymphoma. Subsequently, he underwent chemotherapy with carboplatin and *nab*-paclitaxel for the stage IVA pulmonary SCC.

2. Discussion

Collision tumors are two independent neoplasms that mutually invade an organ. Primary pulmonary collision tumor consisting of SCC and MALT lymphoma is extremely rare, although pulmonary collision tumors have been reported [1–3]. To our best knowledge, only one case of collision tumor consisting of carcinoma and lymphoma has been reported previously [1].

The etiology of pulmonary collision tumor comprising carcinoma and lymphoma is unclear. Two possible etiologies have been proposed: (1) accidentally, two different cancers arise in neighbor regions independently and (2) one carcinogenic stimulus caused the simultaneous development of two different cancers in one region. The heavy-smoking history of the present patient supports the latter hypothesis. Pulmonary SCC is caused by smoking. Meanwhile, the impact of smoking in the development of pulmonary MALT lymphoma is uncertain (only approximately 30% of patients with pulmonary MALT lymphoma have a smoking history [4]), although it has been reported to be induced by chronic inflammation [5]. In the present case, chronic bronchitis/bronchiolitis caused by smoking was observed in the lung around the tumor. Thus, smoking may have indirectly induced the MALT lymphoma.

The prognosis of collision tumor depends on the cancer with the more aggressive biological behavior. MALT lymphoma is a low grade B-cell lymphoma, while SCC is more malignant. Additionally, SCC in the present case was stage IVA; therefore, the prognosis of the present case probably depends on SCC. The carcinoma cell detected from intraoperative lavage fluid of thoracic cavity indicates that chemotherapy should be administered subsequently. The optimal treatment strategy for collision tumor should be determined through comprehensive estimations of the biological behavior and progress of each cancer composing the collision tumor.

In our case, differentiating between pulmonary MALT lymphoma and gastric MALT lymphoma was difficult. The gastric MALT lymphoma had not recurred for 5 years after radiotherapy, and the pulmonary MALT lymphoma was a solitary lesion, and no other MALT lesions were found in any other organ; therefore, clinically, the pulmonary MALT lymphoma was diagnosed as the primary lesion. However, we could not completely rule out metastatic pulmonary MALT lymphoma. If the genetic abnormalities in MALT lymphoma, such as t(14;18)(q32;q21), t(1;14)(p22;q32), and t(11;18)(q21;q21) [6] were examined, we might have confirmed the different patterns of genetic alterations and could have distinguished the pulmonary MALT lymphoma from the gastric MALT lymphoma.

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Disclosure

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Masahiro Yamasaki*
Department of Respiratory Disease, Hiroshima Red Cross Hospital & Atomic-bomb Survivors Hospital, Naka-ku, Hiroshima, Japan
E-mail address: myamasanjp@yahoo.co.jp.

Tomoyoshi Takenaka
Department of Surgery, Hiroshima Red Cross Hospital and Atomic-bomb Survivors Hospital, Naka-ku, Hiroshima, Japan

Naoko Matsumoto
Department of Respiratory Disease, Hiroshima Red Cross Hospital & Atomic-bomb Survivors Hospital, Naka-ku, Hiroshima, Japan

Hideki Asaoku
Department of Hematology, Hiroshima Red Cross Hospital & Atomic-bomb Survivors Hospital, Naka-ku, Hiroshima, Japan

Masaya Taniwaki
Department of Respiratory Disease, Hiroshima Red Cross Hospital & Atomic-bomb Survivors Hospital, Naka-ku, Hiroshima, Japan

Noboru Hattori
Department of Molecular and Internal Medicine, Institute of Biomedical & Health Sciences, Hiroshima University, Minami-ku, Hiroshima, Japan

* Corresponding author at: 1-9-6 Senda-machi, Naka-ku, Hiroshima, 730-8619, Japan.