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CASE REPORT

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Malignant pleural mesothelioma in a kidney transplant recipient

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Abstract

Post-transplantation malignancy is one of the most common complication-related mortality in transplant recipients. Here, we report the case of a kidney transplant patient for 2 years with malignant pleural effusion that was subsequently diagnosed as malignant pleural mesothelioma.

KEYWORDS

Kidney transplantation; malignant pleural effusion; mesothelioma

INTRODUCTION

Malignant pleural mesothelioma is an uncommon malignancy in Thailand[1] because of the low number of asbestos manufacturing industries in the asbestos era. In addition, the occurrence of this malignancy in kidney transplant patients was rare. Here, we describe a case of non-asbestos-related malignant mesothelioma developed after kidney transplant.

CASE REPORT

In August 2020, a 53-year-old man presented to our hospital with a 2-month history of progressive dyspnea and right pleuritic chest pain. He noticed a little dry cough without fever. Two weeks before the presentation, he visited a secondary care hospital, where chest X-rays demonstrated a right pleural effusion. Para-pneumonic effusion was initially diagnosed, and intravenous antibiotic was prescribed. However, his symptoms did not improve, and he was then transferred to our hospital.

The patient had received a living donor kidney transplant from his daughter for end-stage renal disease caused by diabetes mellitus in September 2018. The operation was uneventful, and he had prompt graft function. The immunosuppression regimen consisted of mycophenolic acid, cyclosporine, and prednisolone. He was routinely followed-up in the kidney transplant clinic, and his renal function remained normal. The patient had worked as a police officer, and neither he nor his family members had any history of prior asbestos exposure.

On admission, the patient was in no distress and had no fever. The vital signs were in normal limits with the oxygen saturation 95% at room air. Physical examination revealed decreased breath sounds and dullness on percussion at the right hemithorax. There was no fluctuation or tenderness at the site of kidney transplantation. Other physical findings were unremarkable.

Complete blood count showed a hematocrit of 49%, a white blood cell count of 9370 cells/mm^3 with 86% neutrophils, 5% lymphocytes, 9% monocytes, and a platelet count of 277 000 cells/mm^3. Blood sugar was 96 mg/dL. Serum creatinine and lactate dehydrogenase (LDH) was 1.0 mg/dL

Abbreviations: CT, computed tomography; KS, Kaposi's sarcoma; LDH, lactate dehydrogenase; PTLD, post-transplant lymphoproliferative disorders; SV 40, Simian virus 40.

and 210 U/L (range, 125–220), respectively. Other blood chemistry and coagulation tests were within normal limits. Chest radiograph revealed a moderate amount of right pleural effusion and pleural thickening involved both costal and mediastinal pleura (Figure 1(a)).

Diagnostic thoracentesis was then performed and yielded turbid, viscous yellow pleural fluid with a white blood cell count of 4110 cells/mm^3 (44% neutrophils and 56% lymphocytes). The pleural fluid had an LDH of 1691 U/L and a protein level of 12 g/L, whereas glucose level was too low to be measured. Pleural fluid cytology revealed only inflammatory cells and reactive mesothelial cells.

A chest computed tomography (CT) scan with contrast revealed diffused enhancing pleural thickening and multiple pleural nodules at right hemithorax (Figure 1(b)). Flex-rigid pleuroscopy was subsequently carried out and demonstrated diffuse erythematous nodules varied in sizes along parietal and diaphragm pleura (Figure 1(c)). Pleural biopsy was performed.

Histopathological examination of the pleural specimen revealed solid and papillary proliferation of large polygonal epithelioid tumor cells with moderate amounts of eosinophilic cytoplasm, vesicular nuclei, and prominent nucleoli. The tumor cells were positive for mesothelial markers including calretinin, D2-40, CK5/6, and WT1, consistent with epithelioid mesothelioma (Figure 2).

After a diagnostic of malignant mesothelioma had been concluded, the CT scan of the chest and abdomen was re-evaluated and showed tumor invasion to both visceral and parietal pleura, right chest wall, mediastinum, and peritoneum. Mediastinal, bilateral hilar, supraclavicular, and intra-abdominal lymph nodes were also involved. According to the 8th Edition of the TNM classification for malignant pleural mesothelioma,[2] the patient was staged as T4N2M1 stage IV.

Medical pleurodesis with talc slurry was performed and the chest tube was removed. Systemic chemotherapy with carboplatin and pemetrexed was prescribed. The follow-up chest radiograph and the CT scan of the chest and abdomen after four cycles of systemic chemotherapy indicated stable disease (Figure 1(d)).

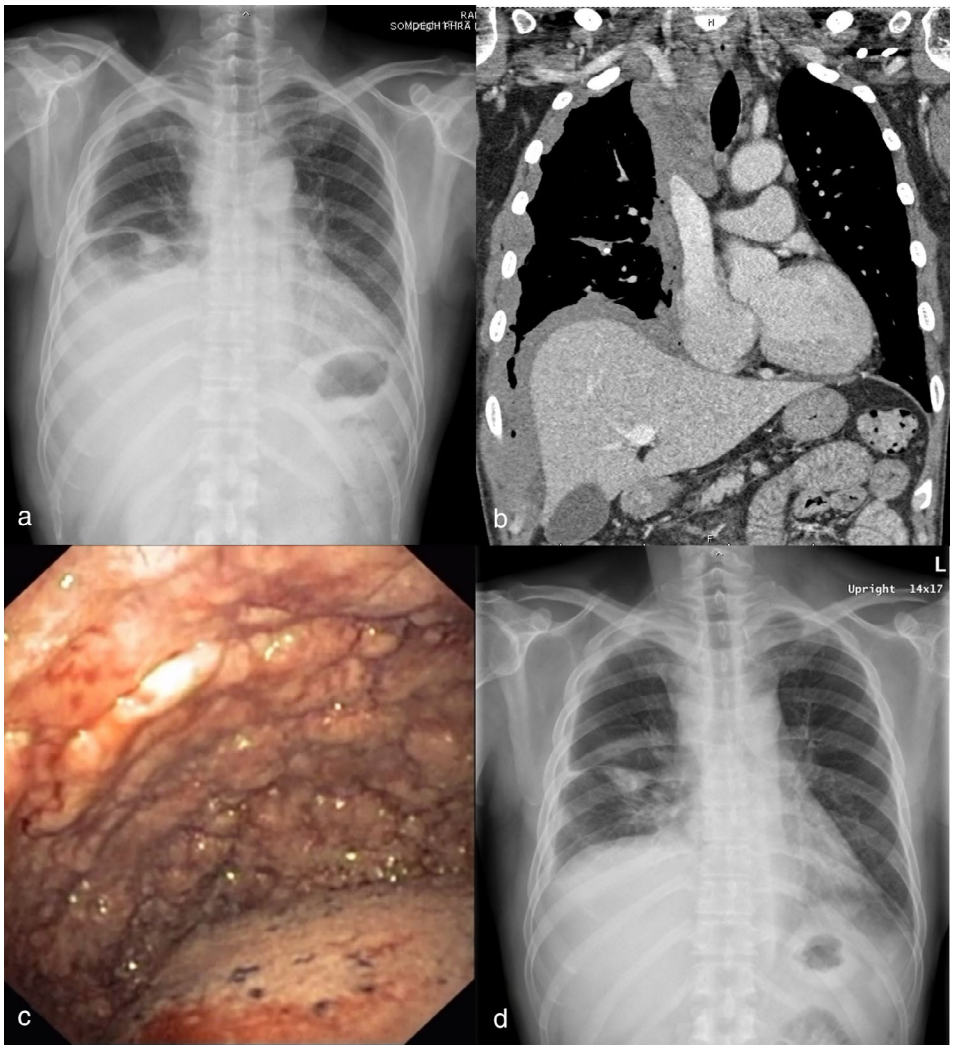

FIGURE 1 (a) Chest radiograph at presentation demonstrating a moderate amount of right pleural effusion and pleural thickening involved both costal and mediastinal pleura. (b) A contrast-enhanced coronal chest computed tomogram (CT) image with mediastinal window setting showing diffused enhancing pleural thickening and pleural effusion at the right hemithorax. (c) Flex-rigid pleuroscopy revealing diffuse erythematous nodules varied in sizes along parietal pleura. (d) A follow-up chest radiograph demonstrating improvement of right pleural effusion, whereasd pleural thickening remained stable

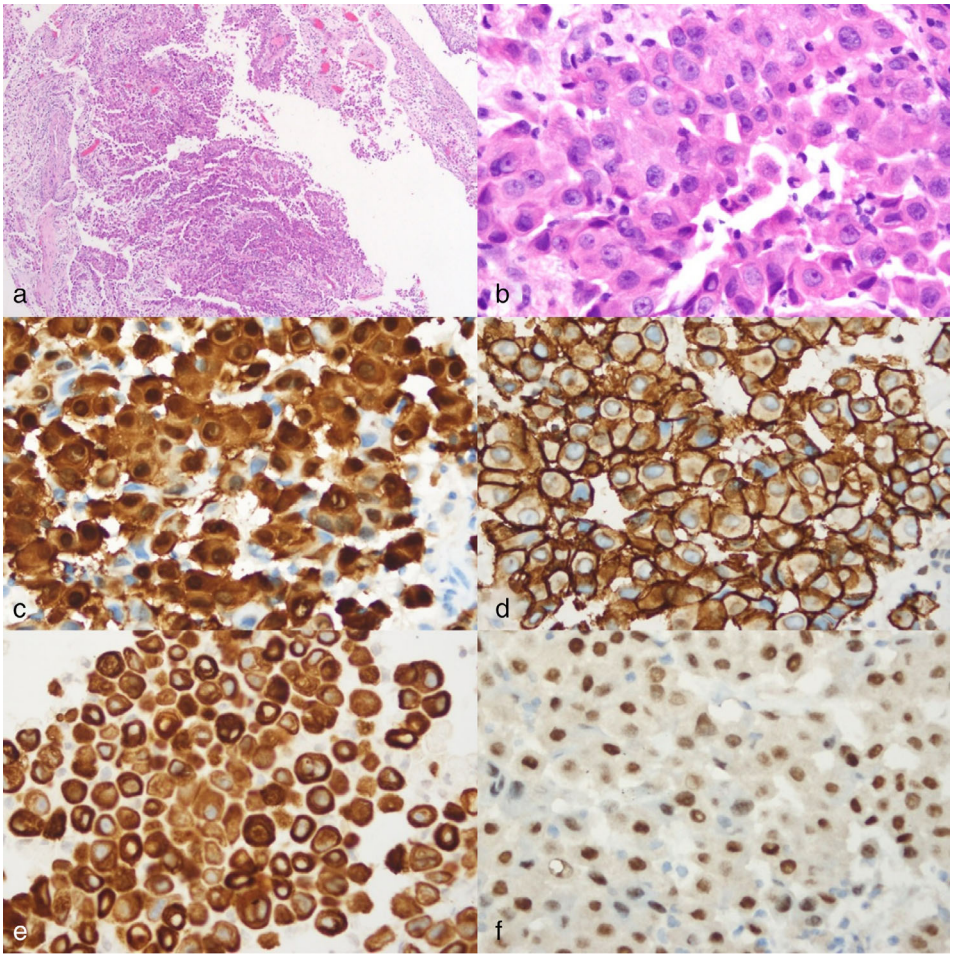

FIGURE 2 (a) Hematoxylin and eosin-stained sections of epithelioid malignant mesothelioma. At low power, the tumor shows solid and papillary proliferation of atypical cells. (b) At high power, the neoplastic cells demonstrating moderate amount of eosinophilic cytoplasm, vesicular nuclei, and prominent nucleoli. (c) Calretinin immunostain showing diffuse, strong nuclear and cytoplasmic staining. (d) D2-40 immunostain showing diffuse and strong membranous expression. (e) CK5/6 immunostain showing diffuse and strong cytoplasmic staining. (f) WT1 immunostain showing diffuse nuclear immunoreactivity (original magnification ×40 (a); original magnification ×400 (b–f))

DISCUSSION

Post-transplantation malignancy is one of the most common complication-related mortality in transplant recipients. The incidence ranges from 2%–31% and increases up to 34%–50% in patients whom were followed for more than 20 years.[3] The Kaposi's sarcoma (KS), post-transplant lymphoproliferative disorders (PTLD), and lung and kidney cancer were reported to be the most common post-transplantation malignancies in kidney transplant recipients,[3–5] similar to overall solid organ transplant recipients.[6] Malignant mesothelioma has been reported in solid organ transplantation and also in kidney transplantation, but only in a few cases.[3–6] To our knowledge, this is the first case report of post-transplantation malignant mesothelioma in Thailand where the prevalence of this cancer is extremely low.

Post-transplantation malignancy risk is largely because of immunosuppression and oncogenic viral infections. Simian virus 40 (SV40) was shown to be oncogene-associated with malignant mesothelioma.[7] Unfortunately, because of the lack of specific tests, we did not investigate this association in our patient, who had no known history of asbestos exposure.

The duration from the organ transplantation to the development of post-transplantation malignancy varies among the types of cancer. For example, KS has been reported to develop at as early as 13–18 months whereas kidney cancer occurs at a longer period of 53 months.[3,8] PTLD has a wide range of onset duration, from a median time of 9 months due to Epstein–Barr virus infection to a very late onset at the median time of 154 months because of prolonged use of immunosuppressive agents.[9] Malignant mesothelioma has been reported to develop in organ recipients with the onset from 18–38 months post-transplantation,[3,8,10,11] similar to our patient. We postulated that an early onset of post-transplantation malignant mesothelioma might be because of the SV40 infection/reactivation, similar to what Epstein–Barr virus do with the early-onset PTLD. However, more evidence should be sought before the conclusion can be made.

Histologically, there are three main subtypes of malignant mesothelioma: epithelioid, sarcomatous, and biphasic. Epithelioid mesothelioma is the most common subtype comprising 50%–70% of all mesothelioma cases. In addition, it carries the best prognosis of all mesothelioma subtypes. To date, data regarding the most common subtype and prognosis in post-transplantation malignant mesothelioma

remains limited. More case reports/series are needed for further understanding of this rare malignant tumor.

In conclusion, we report a case of a kidney transplant patient who presented with malignant pleural effusion and was subsequently diagnosed as malignant pleural mesothelioma. Although rare, physicians should keep the possibility of this disease in mind, even in the absence of the history of asbestos exposure, to help select the proper diagnostic technique.

CONTRIBUTIONS

W.T. took care of the patient, reviewed literature, and wrote the manuscript. C.S. took care of the patient, performed the procedure, reviewed literature, and wrote the manuscript. D.J. took care of the patient and reviewed the manuscript. V.B. took care of the patient, performed the procedure, reviewed literature, and wrote the manuscript. W.K. interpreted histological finding and reviewed the manuscript.

DECLARATION OF PATIENT CONSENT

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

DISCLOSURE

The authors declare no conflicts of interest.

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