Clinical Case Report

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Concomitant occurrence of primary renal non-Hodgkin lymphoma and a colon cancer

A rare case report

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Abstract

Rationale: Primary renal lymphoma (PRL) is a rare malignancy due to the absence of lymphatic tissues in the kidney, and patients with PRL have been reported to have a poor prognosis due to its rapid invasiveness and limited treatment strategies. Colon cancer is the third most common cancer, and has a high mortality rate. Both malignant diseases predominantly affected elderly men; however, a case with concomitant occurrence of the 2 cancers is extremely rare.

Patient concerns: A 78-year-old male patient with abdominal pain came to our hospital. Computed tomography (CT) indicated malignant masses in the left kidney, left adrenal gland, and the lower part of the descending colon.

Diagnoses: PRL and colon cancer were diagnosed based on pathological examinations.

Interventions: The patient was treated with laparoscopic radical nephrectomy and laparoscopic radical resection of colon cancer.

Outcomes: The patient was then transferred to the intensive care unit (ICU) because of poor condition after surgery. He died 3 months after discharge without receiving any other treatment.

Lessons: It is worth thinking about whether surgery was reasonable for elderly patients with double malignancies, or palliative treatment to improve the quality of life was more meaningful. This case also contributes to the understanding of the 2 malignancies and highlights the need to pay more attention to patients with multiple primary malignant neoplasms (MPMNs), explore genetic features, and investigate treatments with more survival benefits.

Abbreviations: CT = computed tomography, DLBCL = diffuse large B-cell lymphoma, FDG = fluorodeoxyglucose, HE = hematoxylin-eosin, ICU = intensive care unit, IHC = immunohistochemistry, MPMNs = multiple primary malignant neoplasms, MSI = microsatellite instability, NHL = non-Hodgkin lymphoma, PET = positron-emission tomography, PRL = primary renal lymphoma.

Keywords: colon cancer, diffuse large B-cell lymphoma, primary renal non-Hodgkin lymphoma

1. Introduction

Primary renal lymphoma (PRL) is uncommon and controversial because there is no lymphatic tissue in the kidney and the development of the disease remains unclear. It has been reported that the proportion of PRL among all kinds of renal tumors is only 1%,[1] and merely 100 cases have been reported in the literature.[2] PRL is usually observed in adult patients with an average age of 60 years and the incidence is slightly higher in males than in females.[3] In addition, patients with PRL usually have a worse prognosis than those with nodal lymphoma because of the aggressiveness of PRL and lack of standard treatment strategies.[4]

As the third most common malignancy and the fourth leading cause of cancer-related death worldwide, colon cancer is a serious threat to human health.[5] Incidence shows dominant male preponderance which strongly increases with age and median age at diagnosis is about 70 years in developed countries.[6] Though the 2 malignancies shared similarities in gender and age, without findings of common genetic features, concomitant occurrence is an exceptional event and rarely reported. In this report, we present a case of concomitant PRL and colon cancer and a review of the relevant literature.

2. Case presentation

A 78-year-old Chinese man was admitted to a primary medical unit because of ceasing air exhaust and defecation accompanied with abdominal pain. No history of weight loss, fever, night sweats, adrenal insufficiency symptoms, or urinary tract symptoms was observed. No physical finding other than abdominal tenderness was found. Abdominal computed tomography (CT) showed 2 masses in the lower part of the descending colon and left kidney. Colonic stent implantation was performed to improve the aforementioned symptoms. The patient was then transferred to the department of gastrointestinal surgery in our hospital for further examinations and treatments. Abdominal

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XM and XS contributed equally to this work.

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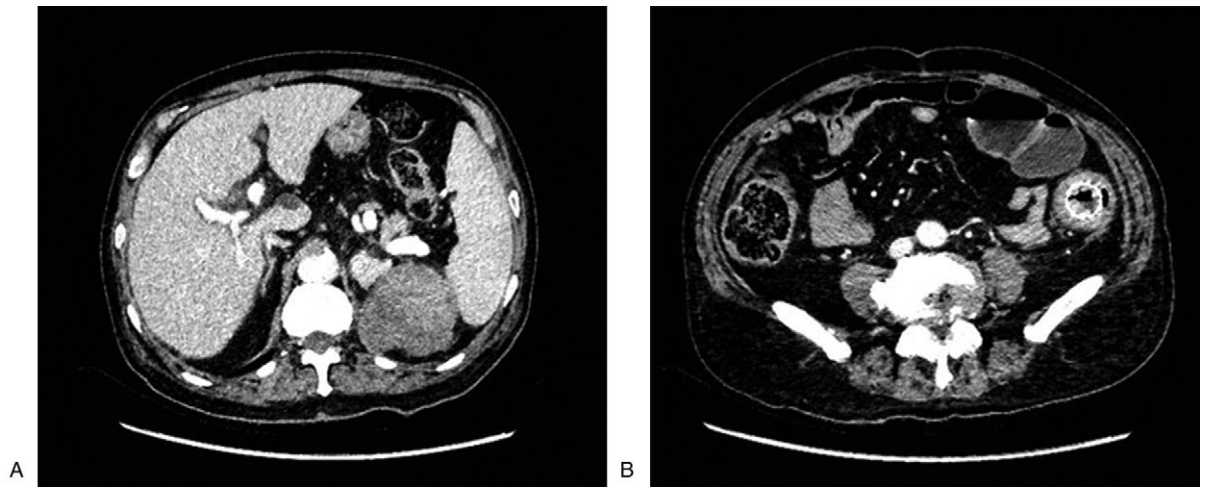

Figure 1. Neoplasms showed by contrast-enhanced CT. A, Neoplasms in left kidney and adrenal gland. B, A neoplasm in the lower part of the descending colon. CT = computed tomography.

contrast-enhanced CT showed a space occupying lesions of descending colon with a stent, left kidney, and left adrenal gland (Fig. 1). No other tumor or lymph node involvement was seen based on total body CT scan. Laboratory examinations showed only a low level of hemoglobin (9.8 g/dL) and platelets (81×10^3/μL), other parameters were within the normal range. After discussion by a multidisciplinary treatment group, laparoscopic radical nephrectomy and laparoscopic radical resection of colon cancer were then performed simultaneously.

Macroscopically, the mass in left kidney and adrenal gland was $7 \times 5.5 \times 4$ cm in dimension, the cut surface was brown, solid, and hard (Fig. 2A); an ulcerative mass approximately $10 \times 4.5 \times 1.2$ cm in dimension with a network stent in the lumen of descending colon was observed, the cut surface was gray, solid, and toughening (Fig. 2B).

The pathological report was compatible with non-Hodgkin lymphoma (NHL) in the left adrenal gland and kidney. It was classified as a diffuse large B-cell lymphoma (DLBCL), non-GCB type with CD10(−), Bcl-6(+), MUM-1(+), CD20(+), CD3(−), CD79a(+), CD43(−), CD5(−), Bcl-2(+80%), ALK(−), PAX-5(+), CD30(−), CD38(−), CD21(−), c-Myc(+30–40%), CyclinD1(−), CD23(−), P53(+10%), CK-pan(−). The proliferation fraction as detected by Ki67 was 70% + (Fig. 3). The pathological examination of colon cancer showed a moderately differentiated adenocarcinoma and the stage of the patient was classified as IIIB (pT3N1bM0) according to the American Joint Committee on Cancer (AJCC) Cancer Staging Manual (8th Edition). Immunohistochemistry (IHC) revealed Ki-67(+80%), MLH1(+70%), MSH2(+80%), MSH6(+80%), P53(+60%), CDX-2(follicle+) (Fig. 4).

The patient was then transferred to intensive care unit (ICU) for further treatments because poor postoperative status and incapable of breath without the ventilator. After 25 days of intensive care, the general condition of the patients was stable and significantly improved. However, the patient died 3 months after discharge before he underwent any further treatments. The patient and his family gave informed consent and agreed to participate in this case report. On the other hand, our case does not need ethical approval from ethics committee or institutional review board.

3. Discussion

Multiple primary malignant neoplasms (MPMNs) refer to at least 2 independent primary malignancies in an individual, with a

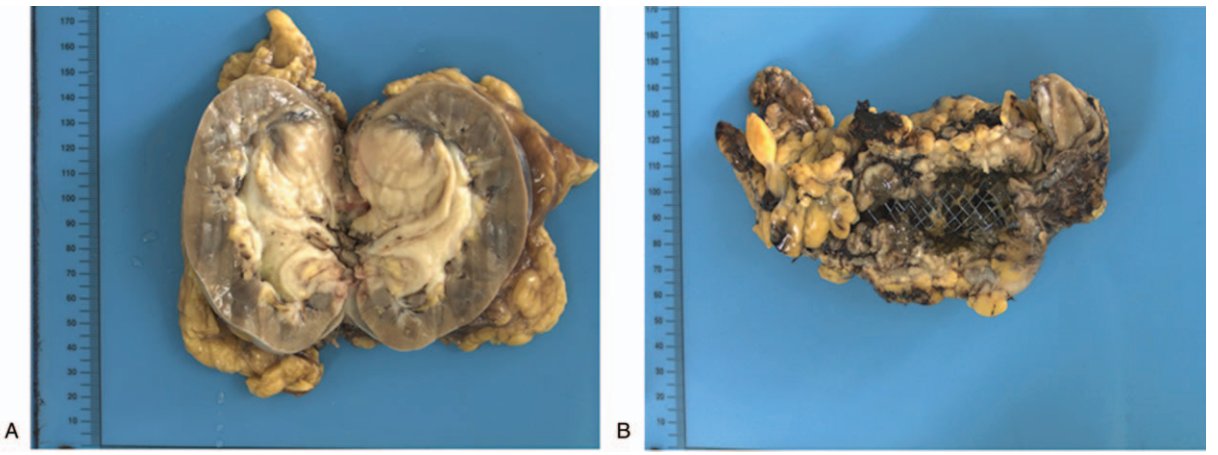

Figure 2. A macroscopic view of the cut-end surfaces of the resected specimens. A, Left kidney and adrenal gland. B, Descending colon.

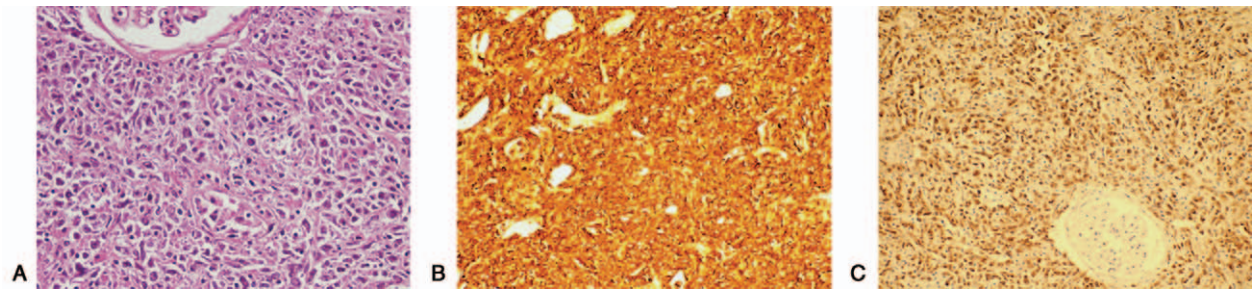

Figure 3. HE and IHC staining of PRL. A, HE staining showed morphology of non-Hodgkin lymphoma in kidney. B, Positive staining of CD20. C, Positive staining of CD79a. (Magnification: ×200) HE = hematoxylin-eosin, IHC = immunohistochemistry, PRL = primary renal lymphoma.

prevalence range from 0.4% to 21.0% in various publications.[7,8] Though increased frequency of MPMNs has been found over the years, concomitant occurrence of PRL and colon cancer has not been reported before as far as we know.

Lymphoma is a malignancy that can affect any organ in the body and present with various symptoms.[9] Extra-nodal manifestations in organs such as gastric tract and the central nerve system represent approximately 30% to 50% of NHL cases.[10] The incidence of renal-involved cases in NHL ranges from 2.7% to 6%,[11] while PRL only accounts for 0.7% of the extra-nodal lymphomas and 0.1% of all malignant lymphomas.[2,12] According to previous case reports, flank pain is the most common symptom in patients with PRL, which is also the main symptom of our patient.[3] Furthermore, PRL usually has aggressive B cell histopathological characteristics,[13] and since the most common pathology is DLBCL,[14,15] adrenal glands could also be affected,[16,17] which are all consistent with our case.

Though an increasing number of cases were reported in recent years, the presence of PRL was still controversial owing to the absence of lymphatic tissues in the kidney. To explain the development of PRL, many scientists have suggested the following: Some have suggested that PRL might originate within the kidney owing to intensive recall of the B lymphocytes in the parenchyma in response to persistent inflammation.[2,18] Others speculated that PRL might generate from adjacent lymph nodes such as renal capsule which is rich in lymphatics,[10,19] and manifest as focal masses, large infiltrative lesions to engulf the kidney, or diffuse bilateral to enlarge the kidneys.[20]

Lacking in specific symptoms and laboratory indexes makes PRL difficult to diagnose before surgery.[21,22] To date, the diagnostic criteria of PRL made by Stallone in 2000 are still widely used,[1] the criteria are as follows: lymphomatous renal infiltration, nonobstructive uni- or bilateral kidney enlargement, and no extra localization at diagnosis. The patient in our case fulfilled all 3 criteria. Due to poor status of the patient after operation, ^{18}F-fluorodeoxyglucose positron-emission tomography/CT (FDG-PET/CT) and bone marrow biopsy which are important for staging[23,24] were not performed in our case. Thus, the stage of PRL is uncertain. Currently, there is no standard treatment strategy for patients with PRL, let alone its concurrence with another cancer. It has been reported that surgery can significantly improve the survival rate in patients with MPMNs.[25] Many studies suggested that surgery should be performed in patients with MPMNs as long as no significant contraindication was found.[25] Therefore, the patient in our case underwent radical nephrectomy and radical resection of colon cancer. However, aggressive chemotherapy was also suggested for patients with PRL; otherwise, patients may die within 1 year due to rapid dissemination from the primary site.[26,27] Many case reports demonstrated that R-CHOP regime (rituximab plus cyclophosphamide/ doxorubicin/ vincristine/ prednisone) with or without nephrectomy may confer survival benefit to PRL patients to a certain extent.[1,2,4,13,28,29] It has also been suggested that adjuvant chemotherapy is recommended for all patients with stage III colon cancer without contraindications after curative resection.[6] In view of the poor condition, age of the patient, and potential intolerance of chemotherapy in our case, combined chemotherapy for treating PRL and stage IIIB colon cancer could be a huge challenge for oncologists. Actually, the patient in our case died 3 months after discharge, due to a malignancy of the synchronous cancers without receiving any other treatment.

In our case, the patients denied having a family history of colon cancer. Though colon cancers with high microsatellite instability (MSI) demonstrate the characteristics of synchronous occurrence with additional tumors,[30] IHC showed positive staining of

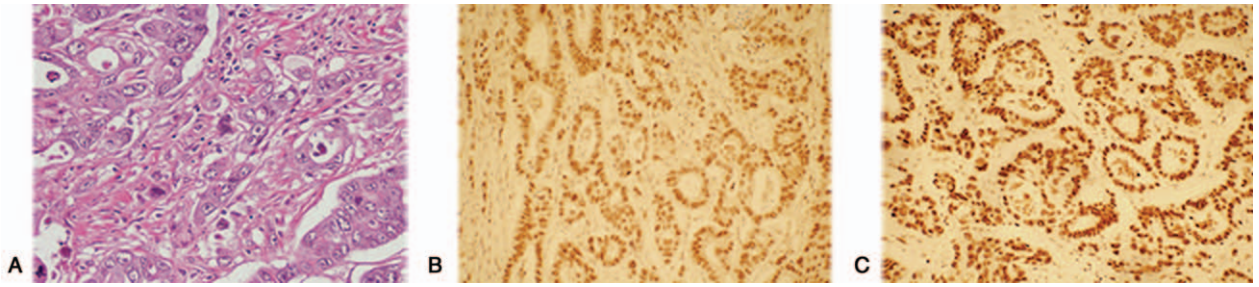

Figure 4. HE and IHC staining of colon cancer. A, HE staining showed moderate differentiated colon adenocarcinoma. B, Diffuse and strong expression of MLH1. C, Strong expression of MSH2. (Magnification: ×200) HE = hematoxylin-eosin, IHC = immunohistochemistry.

mismatch repair proteins MLH1 and MSH2. That is to say, the synchronous occurrence of the 2 cancers in our case might not have been induced by MSI. Common genetic features between PRL and colon cancer still need further exploration.

To conclude, concomitant occurrence of PRL and colon cancer is extremely rare, and to our knowledge, has not been reported previously. Such a rare case highlights the need for more focus on investigation of the diagnosis and treatment strategies for these diseases. It is worth thinking about whether surgery or palliative treatment was more reasonable for elderly patients with double malignancies. Besides, our report suggests that it is critical to advance the understanding of the molecular mechanisms underlying the pathogenesis of MPMNs and develop effective therapeutic options and strategies. In addition, early detection and timely diagnosis are all essential for efficient treatment of MPMNs. To offer effective diagnostic and therapeutic strategies, more detailed attention might need to be paid to clinical characteristics and molecular biologic changes in these patients.

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Author contributions

XM and XS designed the study; JL was the major contributor in writing the manuscript; XS and YZ performed the histological examination and immunohistochemistry; BW collected the patient data. All authors read and approved the final manuscript.
Data curation: Bin Wang.
Methodology: Yabin Zou.
Resources: Xun Sun.
Writing – original draft: Ji Li.
Writing – review & editing: Xiangwei Meng.

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