

## A Case of Rectal Metastatic Tumor in the Soft Tissue of the Hand

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### Abstract

Hand metastases occur infrequently, and metastatic tumors in the soft tissue of the hand caused by rectal cancer are extremely rare. We report a case here. The patient was a 76-year old man. He underwent Miles' operation for rectal cancer located in the lower portion of the rectum. Histopathologically, the resected specimen showed well-differentiated adenocarcinoma. Six years postoperatively, a tumor involving the soft tissue of the palma was found in his left hand. The tumor was resected, and pathological examination showed a well-differentiated adenocarcinoma similar to the primary rectal carcinoma. Immunohistochemical examination demonstrated that this hand tumor had metastasized from rectal cancer. Fifteen cases of colorectal metastatic tumors in the hand have been documented, of which three were soft-tissue metastases. This report describes the fourth case.

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**Key words:** metastasis, hand, soft tissue, rectum, immunohistochemical examination

### Introduction

Metastases to the hand from any primary tumor are rare<sup>1</sup>. Of the reported cases, the majority arose from the lung, breast, kidney, hard palate, larynx and pharynx<sup>2</sup>. Most hand metastases involve bone invasion, and soft tissue metastases to the hands are extremely rare<sup>3</sup>. We report a rare case of a metastatic tumor to the soft tissue of the hand from rectal cancer.

### Case Report

The patient was a 76-year-old man. He had had no

complications following Miles' operation for rectal cancer in the lower portion of the rectum six years earlier. The tumor was diagnosed as P<sub>0</sub>, H<sub>0</sub>, M(–), N<sub>1</sub>, Stage IIIa, D<sub>3</sub> according to the criteria of the Japanese Society of Colon and Rectal Diseases. Histopathologically, the resected rectal carcinoma showed a well-differentiated adenocarcinoma (pA<sub>2</sub>, ly<sub>1</sub>, v<sub>1</sub>, pN<sub>0</sub>, Stage II). The patient had received radiation therapy for a recurrent tumor in the pelvic cavity two years postoperatively. He was subsequently re-admitted to our hospital complaining of left leg edema and cough six years postoperatively. There were no abnormal findings on physical examination of the chest and abdomen. Laboratory findings showed no liver dysfunction but

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did demonstrate anemia (RBC:  $246 \times 10^4/\mu\text{L}$ , Hb: 6.6 g/dL) and increased serum CEA (349 ng/mL). PSA was in the normal range. Chest computed tomography demonstrated a metastatic tumor ( $\phi 10$  cm) in the upper lobe, metastatic tumors ( $\phi 2$  cm) involving  $s^4$ ,  $s^6$ ,  $s^{10}$ , and a metastatic tumor ( $\phi 5$  cm) in the hilus of the right lung. Pelvic computed tomography revealed an enlarged local recurrent mass and lymph node swelling in the pelvic cavity, but the prostata was normal. There were no liver metastases. He received conservative therapy and pain control therapy. Two months after the current admission, an oval tumor with ulcerations ( $5 \times 5$  mm) was observed in the left hand. The lesion was located in the soft tissue of the palm (**Fig. 1**). This tumor was probably overlooked at the time of re-admission. The patient was asymptomatic, but the clinical findings suggested malignancy. Partial resection of the tumor was performed under local anesthesia, and the pathological examination (Hematoxylin and eosin stain; HE stain) showed a well-differentiated adenocarcinoma similar to the primary rectal carcinoma (**Fig. 2**). Immunohistochemical examination showed that cytokeratin7 (CK7) and cytokeratin20 (CK20) were diffusely positive, and that  $\beta$ -catenin was focally positive in both the primary and metastatic tumors (**Fig. 3**). Furthermore, CEA was positive in both lesions. Villin was negative in the primary tumor but positive in the metastatic tumor. Thyroid Transcription Factor-1 (TTF-1) was negative in the metastatic tumor. Therefore, the tumor of the hand was diagnosed as a metastasis from rectal cancer. The patient died of carcinomatosa four months after this admission.

### Discussion

We describe a rare case<sup>3</sup> of a tumor in the soft tissue of the palm. Hand metastases occur infrequently, and represent less than 0.1% of all metastases<sup>1</sup>, although they appear to be more common in men than in women<sup>1</sup>. In previously reported cases, the lung was the most common site of the primary tumor, followed by the kidney and the breast<sup>2</sup>. Colorectal cancer is a most unusual

primary tumor for such metastases<sup>4</sup>. In our case, partial resection of the tumor was done under local anesthesia, and pathological examination (HE stain) showed a well-differentiated adenocarcinoma similar to the primary rectal carcinoma. However, chest computed tomography revealed multiple lung tumors. Therefore, an immunohistochemical examination was performed for the differential diagnosis of lung ca and colorectal ca. This examination showed that CK7<sup>5</sup> and CK20<sup>5</sup> were diffusely positive in both the hand tumor and the rectal tumor (**Fig. 3**). Wang reported that the CK7 (negative)/CK20 (positive) immunophenotype was strongly suggestive of gastrointestinal tract lesions, particular those of colorectal origin<sup>5</sup>. However, in this case, both CK7 and CK20 were positive. For further differential diagnosis, we performed immunohistochemical examinations of CEA<sup>6,7</sup> and villin<sup>8</sup> for the diagnosis of colorectal ca and  $\beta$ -catenin<sup>9</sup>, and of TTF-1<sup>10,11</sup> for the differential diagnosis of lung ca and colorectal ca. CEA was positive in both the primary and metastatic tumors, whereas villin was negative in the primary tumor but positive in the metastatic tumor. Generally villin is positive in colorectal tumors<sup>21</sup>, but in this case, it was probably negative due to heterogenesis and preservation of the primary rectal tumor.  $\beta$ -catenin was focally positive in both the primary and metastatic tumors (**Fig. 3**), while TTF-1 was negative in the metastatic tumor. Therefore, we diagnosed the hand tumor as metastasis from rectal cancer. Immunohistochemical examination using appropriate antibodies was useful for the differential diagnosis of the primary tumor.

Cutaneous metastases may develop through four mechanisms: lymphatic spread; intravascular dissemination; direct extension of the tumor; and surgical dissemination<sup>12,13</sup>. In this case, we could not demonstrate the mechanism of metastases histopathologically, but the metastatic tumor in the soft tissue of the hand had appeared after large metastatic tumors in the right lung and an enlarged locally recurrent mass in the pelvic cavity. We speculate that the mechanism in this case was intravascular dissemination. Buckley reported that hand bony metastases probably occur as a result of



Fig. 1 Tumor in the soft tissue of the palm of the hand.  
Scale (cm)

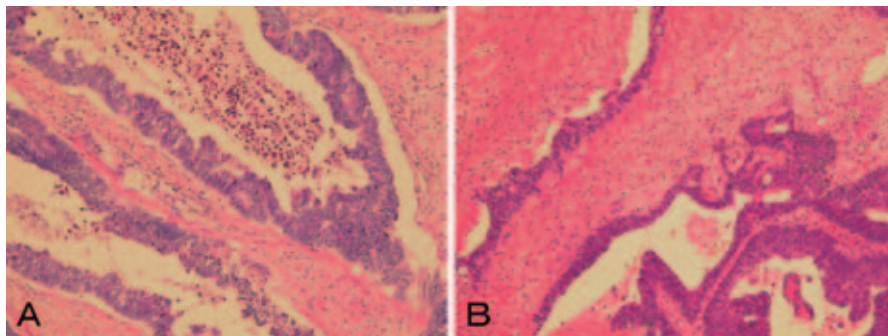


Fig. 2 Histological findings; primary tumor (A) and metastatic tumor (B). Hematoxylin and Eosin Stain (HE) ( $\times 10$ )

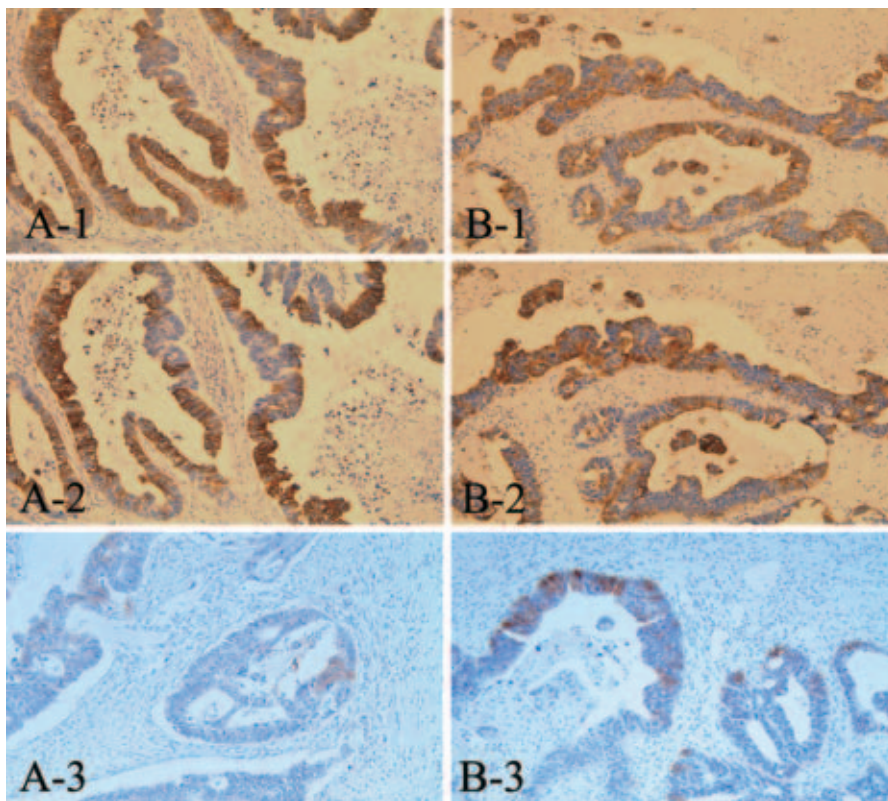


Fig. 3 Histological findings; primary tumor (A) and metastatic tumor (B). Immunohistochemical Examination ( $\times 20$ )  
(A, B, -1) cytokeratin 7: diffusely positive; (A, B, -2) cytokeratin 20: diffusely positive; (A, B, -3)  $\beta$ -catenin: focally positive

Table 1 Review of the literature on colorectal metastatic tumors in the hand

	Author		Primary site	Age	Sex	Metastatic site	Survival time after diagnosis of hand metastases
1	Kerin <sup>15</sup>	1958	Rectum	61	M	Distal phalanx of the Left middle finger	6 Months
2	Brette <sup>16</sup>	1961	Colon	49	F	Left third metacarpal	4 Months
3	Hummel <sup>17</sup>	1962	Rectum	52	F	Left third proximal phalanx	5 Months
4	Guttmann <sup>18</sup>	1968	Cecum	84	F	Right thumb	unknown
5*	Gottlieb <sup>19</sup>	1970	Sigmoid colon	72	F	The soft tissue of palm	6 Months
6	Bryan <sup>4</sup>	1974	Colon	61	M	Left luminate	unknown
7*	Wu and Guise <sup>20</sup>	1978	Colon	83	M	The soft tissue of dorsal	6 Months
8	Morton <sup>21</sup>	1985	Rectum	73	M	Right fifth metacarpal	6 Months
9	Tupper <sup>21</sup>	1985	Rectum	54	F	Proximal phalanx of thumb	10 Months
10	Buckley <sup>14</sup>	1986	Sigmoid colon	78	F	The destruction of the trapezium in the left hand	6 Months
11	Buckley <sup>14</sup>	1986	Trans colon	61	F	Left fourth proximal phalanx	2 Months
12	Amadio <sup>22</sup>	1987	Colon	61	M	Left luminate	12 Months
13	Hindley <sup>23</sup>	1987	Colon	44	M	Left fifth middle phalanx	unknown
14	K. Henkert <sup>24</sup>	1991	Sigmoid colon	53	M	Left fifth metacarpal	12 Months
15*	J.F. fillous <sup>25</sup>	2000	Sigmoid colon	62	M	The soft tissue of the right hand	10 Months

\* Soft tissue metastases

arterial spread. This would account for lung cancer being the major primary source of such lesions, because emboli in the pulmonary venous system are carried to the left heart and thus into the peripheral arterial system<sup>14</sup>. Most patients with hand metastases die of the disease within 6 months after their appearance<sup>2</sup>. Most secondary tumors in the hand are accompanied by bone invasion, while soft tissue metastases of the hands are extremely rare and asymptomatic<sup>2,3</sup>.

In our case, the hand tumor was also asymptomatic. Metastatic tumors in the hand from rectal cancer are extremely rare<sup>3</sup>. We looked at all the of the that adequate descriptions in the literature of cases of colorectal metastatic tumors in the hand (**Table 1**). The average survival time after the diagnosis of soft tissue metastases to the hand was 7 months. Fifteen cases of colorectal metastatic tumors in the hand have been documented, although soft-tissue metastases account for only 3 of them. This report documents the fourth case.

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