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Case Report

Ileocecal adenocarcinoma with overexpression of P53 protein metastasized to the thenar muscle: report of a rare case and review of literature

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Abstract: Metastatic malignancies of the hand are rare and metastases to the skeletal muscle from the gastrointestinal system are even much rare. Here we present a case of metastatic ileocecal adenocarcinoma to the thenar muscle, which is the first report of thenar muscle metastasis from ileocecal adenocarcinoma with P53 mutation. To date, only two other cases of thenar muscle metastasis have been documented, one is from squamous cell carcinoma of the lung and the other is from rectal carcinoma. The present 67-year-old Chinese man of poorly differentiated adenocarcinoma of the ileocecal region developed metastatic carcinoma in the right thenar eminence, which presented with swelling and pain. Magnetic resonance imaging of the right hand revealed a well-defined enhanced mass in the right thenar muscle. It was proved to be metastatic adenocarcinoma using core needle biopsy, which was supported to be gastrointestinal origination by positive immunoreaction with CDX2. Positive immunoreaction with P53 protein indicated the poor prognosis of the patient. Further systemic evaluation including computerized tomography scans revealed extensive metastases to liver, right kidney, right abdominal wall, left axillary and right subclavicular lymph nodes, and skin of the right thigh. Treatment was given with palliative systemic chemotherapy. After 8 cycles of chemotherapy, the swelling and pain of the right thenar were ameliorated, and the patient regained full use of his right hand and his quality of life was improved. The patient died of liver metastasis 9 months after the diagnosis of the right thenar metastasis. In conclusion, here we display a case of thenar skeletal muscle metastasis from P53 mutated ileocecal adenocarcinoma, who survived 9 months after diagnosis of the rare metastasis. If an oncological patient presents an intramuscular mass, muscle metastasis must be included in the differential diagnosis. Metastatic hand tumors generally indicate systemic spread, so the treatment is usually palliative and the prognosis is poor. The primary objective of treatment is improvement of the patient's quality of life.

Keywords: Ileocecal adenocarcinoma, metastasis, thenar muscle

Introduction

Metastatic malignancies of the hand are rare and usually develop from lung (44%), kidney (12%), or breast (10%) tumors [1]. Most of the metastatic hand lesions are osseous. Metastases to skeletal muscles of the hands are even much rare. Here we report an extremely rare case of metastatic P53 mutated ileocecal adenocarcinoma to the thenar muscle of the right hand.

Case report

Clinical summary

A 67-year-old Chinese man manifested with the right lower abdominal pain and a palpable mass in this region accepted right hemicolectomy in Feb. 2012 in the local hospital. It was proved to be poorly differentiated adenocarcinoma of the ileocecal region, infiltrating into the plasma membrane. Six of 9 lymph nodes were involved.

The patient had already found a bean-like nodule in the right thenar eminence before the surgery, but he did not pay attention to it. Half a month after the surgery, he accepted one cycle of chemotherapy with a regimen containing oxaliplatin. There were no significant adverse effects caused by chemotherapy. However, several days after the first cycle of chemotherapy, the patient complained of pain in the right thenar eminence. He was inpatient again in the local hospital. Magnetic resonance imaging

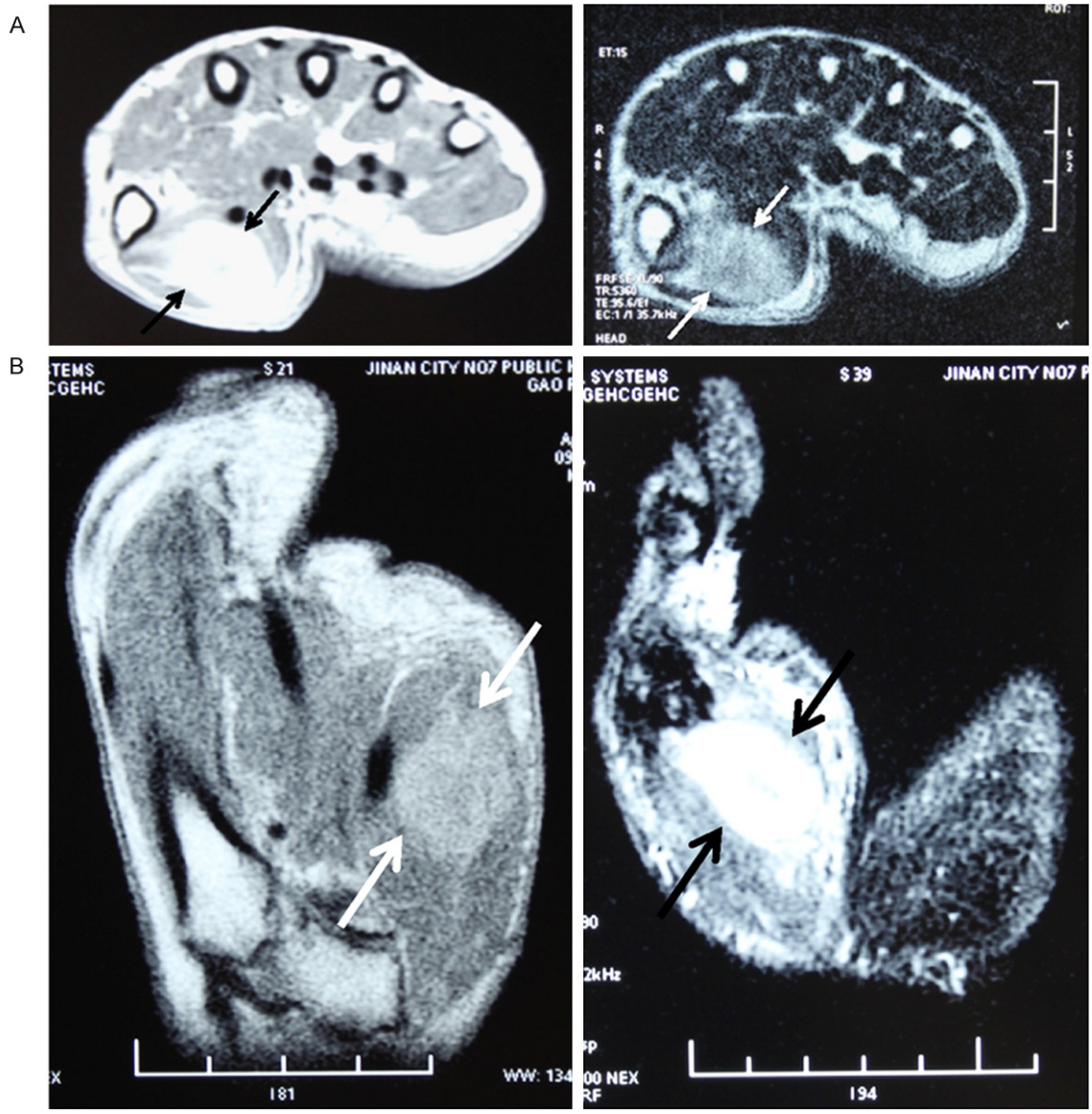

Figure 1. Magnetic resonance imaging (MRI) to the right hand revealed a well-defined enhanced mass in the right thenar muscle. A. Transverse section. B. Longitudinal section.

(MRI) to the right hand revealed a well-defined enhanced mass in the right thenar muscle (**Figure 1A** and **1B**). He was given another cycle of chemotherapy containing oxaliplatin. But the pain was not relieved.

In May 2012, he was referred to our hospital. Physical examination revealed swelling of the right thenar eminence (**Figure 2A**), with a palpable mass about 2 cm in diameter. He had difficulty in gripping and stretching out the right hand. A core needle biopsy of the right thenar showed invasive adenocarcinoma in the muscle (**Figure 3A**), which resembles the original adenocarcinoma in the ileocecal region (**Figure 3B**). The metastatic carcinoma showed positive immunoreaction with CDX2 and P53 by immunohistochemical staining (**Figure 3C** and **3D**), which indicate the colorectal origination. Further systemic evaluation including computerized tomography scans revealed extensive metastases to liver, right kidney, right abdominal wall, left axillary and right subclavicular lymph nodes, and skin of the right thigh (**Figure 4**). He was then treated with standard FOLFIRI (leukovorin, Fluorouracil, and Irinotecan) chemotherapy. After 2 cycles of chemotherapy, the pain was relieved apparently.

Figure 2. Physical examination of the right hand. A. Swelling of the right thenar eminence before chemotherapy, with inflammatory appearance of the right palm. B. After 8 cycles of chemotherapy, the swelling of the right thenar was ameliorated. Wrinkles appeared on the right thenar eminence.

The patient received 8 cycles of chemotherapy totally. The current assessment of efficacy was stable disease, but the swelling and pain of the right thenar were ameliorated. Wrinkles appeared on the right thenar eminence (**Figure 2B**). He regained full use of his right hand and his quality of life was improved. He did not receive further chemotherapy, and sustained-release morphine was used to control his symptoms. The patient died of liver metastasis 9 months after the diagnosis of the right thenar metastasis.

Immunohistochemical staining

Immunohistochemical staining was performed using antibody against P53 (Clone DO-7, 1:500 dilution, DakoCytomation China) and CDX2 (clone DAK-CDX2, 1:400 dilution, DakoCytomation China). Five micron thick paraffin sections were dewaxed, rehydrated in graded alcohols, and processed using DAKO envision detection kit (DakoCytomation, Carpinteria, CA, USA). Most of the tumor cells were immunoreactive with CDX2 and P53 in the nucleus (**Figure 3C** and **3D**), which support that the carcinoma metastasized from the digestive tract and express P53 protein.

Discussion

Colorectal carcinoma mainly metastasizes through either lymphatic or hematogenous spread. The most common organs of colorectal metastasis are the liver and lung; however, metastases to the bone, adrenals, lymph nodes, brain, and skin have also been reported [2]. Metastases are rarely found in skeletal muscle, it is believed to be 0.8-16% in autopsy series [3], despite the fact that skeletal muscle comprises nearly 50% of the total body mass and receives an abundant blood supply. It is thought that muscular contractile actions, local pH environment and the accumulation of lactic acid and other metabolites contribute to the rare occurrence of this phenomenon. The most frequent sites of described clinical involvement are thigh, iliopsoas and paraspinous muscles [4-6]. However, metastasis to the foot and hand is extremely rare (0.007-0.3%), and metastatic hand lesions represent 0.1% of all osseous metastases [1]. To our knowledge, only 22 cases, including the present one, of metastatic colorectal carcinoma to the hand have been reported, in which only 7 cases (31.8%) are soft tissue metastases (**Table 1**). To date, only 2 cases of thenar muscle metastasis have been documented, one is from squamous cell carcinoma of the lung [7], another is from rectal carcinoma [8]. The present case is a new report of

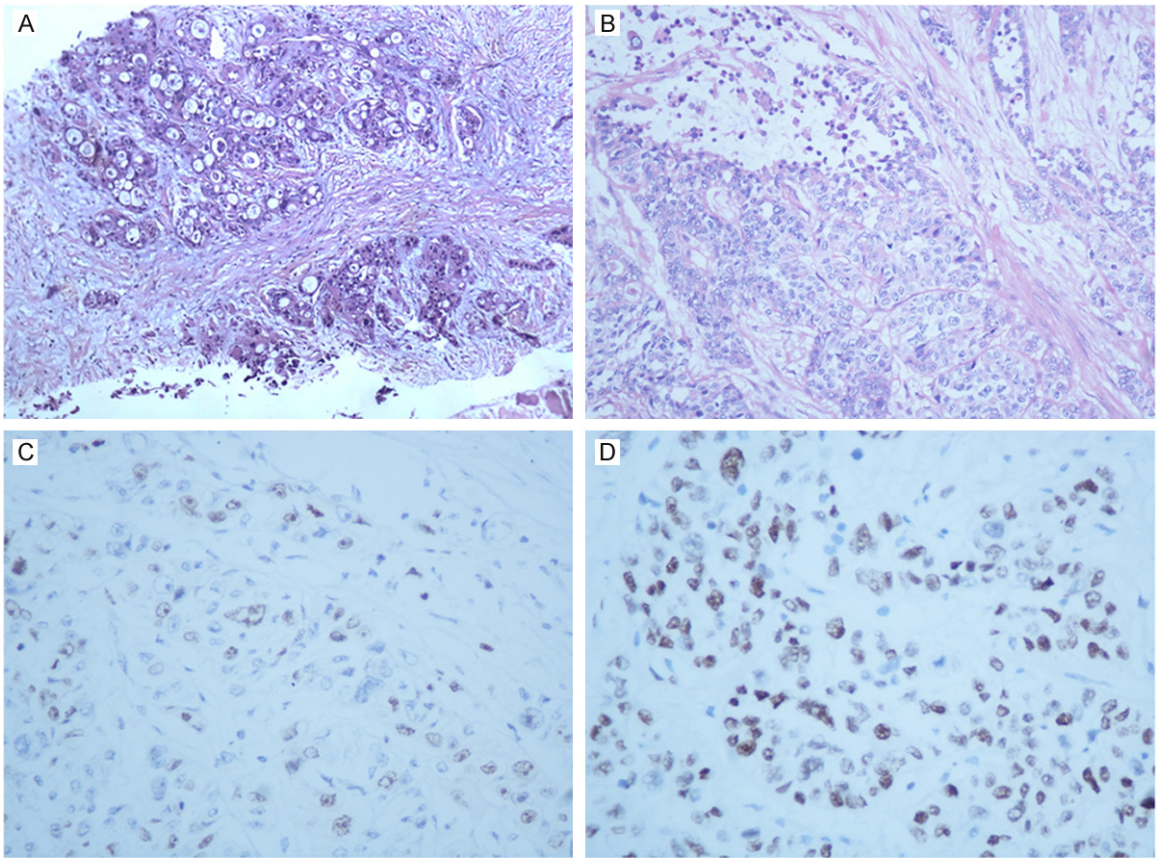

Figure 3. Pathological analysis of the right hand metastasis. A. Invasive adenocarcinoma in the background of connective tissue was demonstrated in the biopsy of thenar (HE stain, ×100); B. Invasive adenocarcinoma was observed in the background of muscular layer of the original carcinoma in the ileocecal region (HE stain, ×100); C. Positive immunoreaction with CDX2 suggests the original carcinoma of ileocecal region (immunohistochemical staining, ×200); D. The carcinoma was immunoreactive with P53 (immunohistochemical staining, ×200).

Figure 4. Metastatic carcinoma presented as a skin nodule in the right thigh.

thenar muscle metastasis from ileocecal carcinoma. The most common presentation of muscle metastasis is local inflammation or pain. Muscle metastasis must be included in the differential diagnosis of oncological patients presenting with an intramuscular mass. In most of the known cases of metastasis to the muscle, lung cancer is the primary malignancy, although there are many other described origins, such as kidney, stomach, pancreas, thyroid and breast cancers [4-6]. Metastatic hand tumors generally occur as a feature of systemic spread, so the treatment is usually palliative. Treatment options of these lesions are dependent upon the status of the patient, the primary origin of the tumor, the extent and localization of the metastases. Amputation, radiotherapy, curettage, cementation, chemotherapy, and wide excision are the most frequently used treatment forms [1]. In the present case, extensive metastases to liver, right kidney, right abdominal wall, left axillary and right subclavicular lymph nodes, and skin of the right thigh had

Table 1. Review of reported cases of metastatic colorectal carcinoma to the hand

Category	Cases	Reported year	Primary site	Age (Years)	Sex	Metastatic site	Survival time* (Months)	Citation
Osseous metastases	1	1958	rectum	61	M	Left third distal phalanx	6	[9]
	2	1962	rectum	52	F	Left third proximal phalanx	5	[10]
	3	1968	cecum	84	F	Right thumb	N/A	[11]
	4	1974	colon	61	M	Left luminate	N/A	[12]
	5	1986	colon	--	--	Right fifth metacarpal	N/A	[13]
	6	1987	sigmoid colon	78	F	Left trapezium	6	[14]
	7	1987	transverse colon	61	F	Left fourth proximal phalanx	2	[14]
	8	1987	colon	61	M	Left luminate	12	[15]
	9	1987	colon	44	M	Left fifth middle phalanx	N/A	[16]
	10	1991	sigmoid colon	53	M	Left fifth metacarpal	12	[17]
	11	1997	colon	--	--	First metacarpal	1	[18]
	12	2005	colon	42	F	Metacarpal bones	N/A	[19]
	13	2006	sigmoid colon	72	M	Distal phalanx of the index finger	>18	20]
	14	2010	transverse colon	76	M	Right fifth distal phalanx	7	[21]
	15	2011	rectum	74	M	Proximal phalanx	3	[22]
Soft tissue metastases	1	1970	sigmoid colon	72	F	Soft tissue of the palm	6	[23]
	2	1978	colon	83	M	Soft tissue of the dorsal	6	[24]
	3	2000	sigmoid colon	62	M	Soft tissue of the right hand	10	[25]
	4	2006	rectum	72	M	Subungual metastasis to the left thumb	6	[26]
	5	2007	rectum	76	M	Soft tissue of the left palm	4	[27]
	6	2011	rectum	53	M	Skeletal muscle of the right thenar eminence	N/A	[8]
	7	2015	ileocecal region	67	M	Skeletal muscle of the right thenar eminence	9	The present case

*Survival time after diagnosis of hand metastasis (months).

also been confirmed. So chemotherapy was used to control the wide spread of the tumor. The patient regained full use of his right hand and his quality of life was improved after 8 cycles of chemotherapy. Patient with hand or skeletal muscle metastasis is thought to be associated with poor prognosis. The average length of survival in patients with hand metastasis was reported to be merely 6 months [1], and the majority of patients with skeletal muscle metastasis from lung carcinoma died within 1 year, with a mean survival period of 8.0 months after resection of the primary carcinoma [3]. Based on the cases that reported the survival (**Table 1**), the mean survival of patients with hand metastasis from colorectal carcinoma was 7.1 months, with little difference between osseous (7.2 months) and soft tissue metastases (6.8 months).

Conclusion

To summarize, here we display a case of thenar skeletal muscle metastasis from ileocecal adenocarcinoma, who survived 9 months after diagnosis of the rare metastasis. If an oncological patient presents an intramuscular mass, muscle metastasis must be included in the differential diagnosis. Metastatic hand tumors generally indicate systemic spread, so the treatment is usually palliative and the prognosis is poor. The primary objective of treatment is improvement of the patient's quality of life.

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Written informed consent was obtained from the son of the patient for publication of this Case report and any accompanying images. A copy of the written consent is available for review by the Editor of this journal.

Disclosure of conflict of interest

None.

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References

[1] Flynn CJ, Danjoux C, Wong J, Christakis M, Rubenstein J, Yee A, Yip D, Chow E. Two cases of acrometastasis to the hands and review of the literature. Curr Oncol 2008; 15: 51-8.

[2] Willett CG, Tepper JE, Cohen AM, Orlow E, Welch CE. Failure patterns following curative resection of colonic carcinoma. Ann Surg 1984; 200: 685-90.

[3] Hasegawa S, Sakurai Y, Imazu H, Matsubara T, Ochiai M, Funabiki T, Suzuki K, Mizoguchi Y, Kuroda M, Kasahara M. Metastasis to the forearm skeletal muscle from an adenocarcinoma of the colon: report of a case. Surg Today 2000; 30: 1118-23.

[4] Damron TA, Heiner J. Distant soft tissue metastases: a series of 30 new patients and 91 cases from the literature. Ann Surg Oncol 2000; 7: 526-34.

[5] Tuoheti Y, Okada K, Osanai T, Nishida J, Ehara S, Hashimoto M, Itoi E. Skeletal muscle metastases of carcinoma: a clinicopathological study of 12 cases. Jpn J Clin Oncol 2004; 34: 210-4.

[6] Plaza JA, Perez-Montiel D, Mayerson J, Morrison C, Suster S. Metastases to soft tissue: a review of 118 cases over a 30-year period. Cancer 2008; 112: 193-203.

[7] Kaira K, Ayabe E, Takahashi T, Murakami H, Tsuya A, Nakamura Y, Naito T, Endo M, Takahashi M, Yamamoto N. Thenar muscle metastasis as recurrence of pulmonary squamous cell carcinoma. Asia Pac J Clin Oncol 2011; 7: 15-6.

[8] Cetin B, Buyukberber S, Yuksel M, Coskun U, Yildiz R, Benekli M. Metastasis of rectal cancer to soft tissue of the hand: an unusual case. Turk J Gastroenterol 2011; 22: 229-30.

[9] Kerin R. Metastatic tumors of the hand. A review of the literature. J Bone Joint Surg Am 1983; 65: 1331-5.

[10] Hummel J, Scott RM. Adenocarcinoma of the rectum with metastases to a phalanx; a case report. J Ky Med Assoc 1962; 60: 158-9.

[11] Guttmann G, Stein I. Metastatic tumor of the thumb from adenocarcinoma of the colon. Int Surg 1968; 49: 217-21.

[12] Bryan RS, Soule EH, Dobyns JH, Pritchard DJ, Linscheid RL. Metastatic lesions of the hand and forearm. Clin Orthop Relat Res 1974: 167-70.

[13] Healey JH, Turnbull AD, Miedema B, Lane JM. Acrometastases. A study of twenty-nine patients with osseous involvement of the hands and feet. J Bone Joint Surg Am 1986; 68: 743-6.

[14] Buckley N, Peebles Brown DA. Metastatic tumors in the hand from adenocarcinoma of the colon. Dis Colon Rectum 1987; 30: 141-3.

[15] Amadio PC, Lombardi RM. Metastatic tumors of the hand. J Hand Surg Am 1987; 12: 311-6.

[16] Hindley CJ, Metcalfe JW. A colonic metastatic tumor in the hand. J Hand Surg Am 1987; 12: 803-5.

[17] Henkert K, Berge G. Malignant metastases on the hand. Zentralbl Chir 1991; 116: 337-41.

[18] Mendez Lopez JM, Garcia Mas R, Salva Coll G. Metastasis of an adenocarcinoma of the colon to the 1st metacarpal bone. Ann Chir Main Memb Super 1997; 16: 134-7.

[19] Ozcanli H, Ozdemir H, Ozenci AM, Soyuncu Y, Aydin AT. Metastatic tumors of the hand in three cases. Acta Orthop Traumatol Turc 2005; 39: 445-8.

[20] Gamblin TC, Santos RS, Baratz M, Landreneau RJ. Metastatic colon cancer to the hand. Am Surg 2006; 72: 98-100.

[21] Anoop TM, George S, Divya KP, Jabbar PK. Metastatic phalangeal osteolysis as an initial presentation of carcinoma colon. Am J Surg 2010; 200: e61-3.

[22] Sur YJ, Kang YK, Bahk WJ, Chang DK, Rhee SK. Metastatic malignant tumour in the hand. J Plast Surg Hand Surg 2011; 45: 90-5.

[23] Gottlieb JA, Schermer DR. Cutaneous metastases from carcinoma of the colon. JAMA 1970; 213: 2083.

[24] Wu KK, Guise ER. Metastatic tumors of the hand: a report of six cases. J Hand Surg Am 1978; 3: 271-6.

[25] Filloux JF, Fontaine C. Soft tissue metastatic tumors of the fingers. Six cases. Chir Main 2000; 19: 63-6.

[26] Gallagher B, Yousef G, Bishop L. Subungual metastasis from a rectal primaDry: case report and review of the literature. Dermatol Surg 2006; 32: 592-5.

[27] Ishikawa N, Tanaka N, Yokoi K, Seya T, Horiba K, Oaki Y, Tajiri T. A case of rectal metastatic tumor in the soft tissue of the hand. J Nippon Med Sch 2007; 74: 309-13.