

Scalp melanoma with rectus abdominis metastasis

A rare case report

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Abstract

Rationale: The main cause of death in melanoma patients is widespread metastases as it can metastasize to almost every organ. However, melanoma skeletal muscle metastases (MSMM) are exceptional, and only a few cases of MSMM to the rectus abdominis muscles have been previously described. And our case maybe the first reported case in Asia region.

Patient concerns: A 45-year-old man with history of right scalp melanoma, pT3aN0M0, stage IIA status post wide excision with 2 cm safe margin and right neck lymph node dissection at 5 years before. He had an almost 5 years disease-free period but presented to our clinic due to intermittent abdominal sharp pain for 1 to 2 months, with a palpable soft tissue mass over his right abdomen. Metastatic melanoma to rectus abdominis muscles was highly suspected.

Interventions: The patient subsequently underwent radical en-block extraperitoneal 15 cm segmental resection of the right rectus abdominis muscle including tumor mass. The resected tumor was a black-gray colored solid mass, and the final histologic study showed a metastasis of melanoma.

Outcomes: Postoperative course of the patient was uneventful, and the right abdominal pain was improved. The patient was referred for further target therapy, but passed away half a year later due to multiple metastasis.

Lessons: Scalp melanoma with isolated rectus muscle metastasis is extremely rare especially for a young aged patient who had an almost 5-year disease-free period. Surgery is a potentially curative therapy for patients with isolated metastatic melanoma. The goal is negative resection margins, in order to avoid local recurrences. Radical compartmental surgery should be considered for selected stage IV melanoma patients with sole rectus abdominis MSMM, whose disease could be amenable to complete resection, in preliminary procedure to prolong disease-free survival time. For oligometastatic disease, surgical resection is sometimes useful in carefully selected patients after systemic therapy; also, it could be performed as symptomatic treatment.

Abbreviations: FDG PET = fluorodeoxyglucose positron emission tomography, MRI = magnetic resonance imaging, MSMM = melanoma skeletal muscle metastases, NCCN = national comprehensive cancer network, PET-CT = positron emission tomography-computed tomography.

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1. Introduction

In United States, melanoma represents only 10% of all skin-cancer diagnoses, but at least 65% of deaths that are related to skin cancer are attributed to melanoma.^[1] A low incidence rate (approximately 1/100,000) has been reported in Asian populations. In Taiwan, the 2015 age-adjusted rate for invasive melanoma was 0.85/100,000 for males and 0.65/100,000 for females.^[2] The main cause of death in melanoma patients is widespread metastases. It can metastasize to almost every organ.^[3] However, melanoma skeletal muscle metastases (MSMM) are exceptional, and only a few cases of MSMM to rectus abdominis muscles have been previously reported, and our case maybe the first reported case in Asia region.^[4]

Due to medical progress and diagnostic technique upgrading, increasingly more number of assistive tools can help us detect metastatic lesion early. Nowadays, fluorodeoxyglucose positron emission tomography (FDG PET) and now positron emission

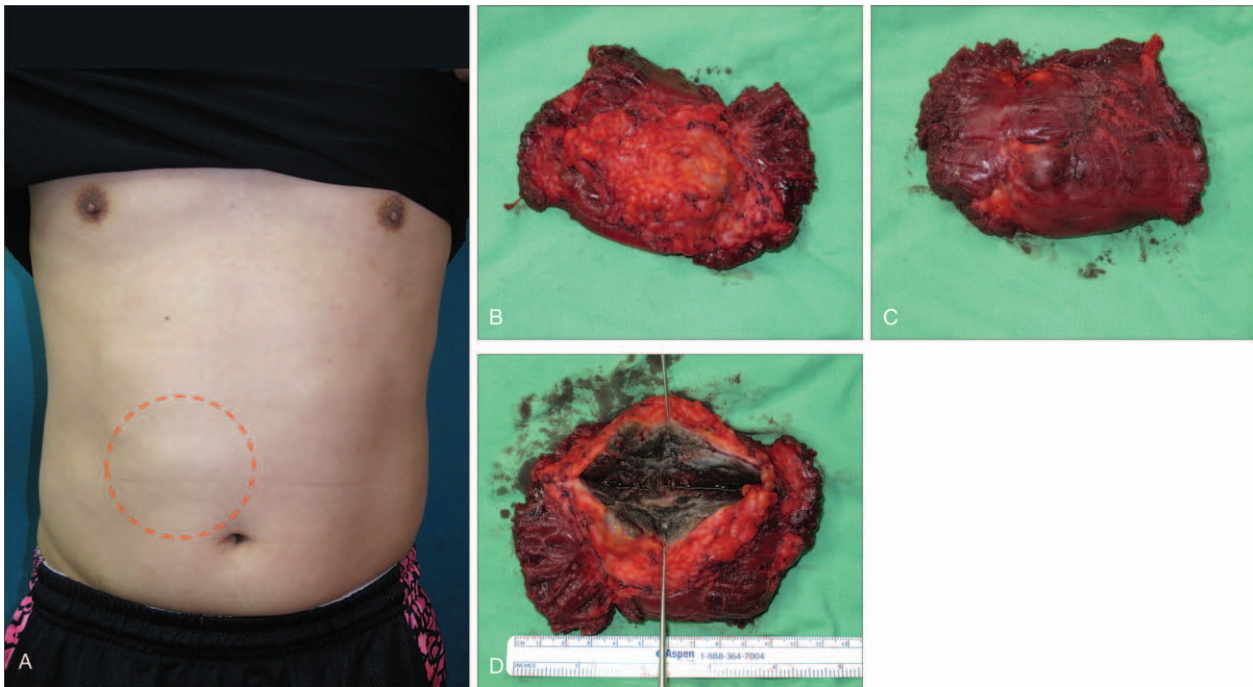


Figure 1. (A) A 45-year-old male presented an isolated palpable mass over the right abdomen, above the umbilicus (dotted orange circle). (B, C, D) Radical en-block extraperitoneal resection of a 15 cm segmental rectus muscle including tumor was performed. The resected tumor (D) was a black-gray color invasive solid mass. (B: ventral view; C: dorsal view).

tomography–computed tomography (PET/CT) imaging have become mainstream clinical imaging tools for staging, therapy assessment, and follow-up evaluation of patients with a wide variety of malignancies. The more routine use of FDG PET/CT imaging in the oncology setting may have contributed to increased metastasis detection incidence. These may lead the stage IV disease diagnosed early when metastatic lesion completely respectable, or oligometastatic disease which could be controlled with combined systemic therapy and surgery.

We present a case of melanoma metastasis to the rectus abdominis muscles abruptly 5 years after the first operation. The patient underwent radical en-block extraperitoneal resection of the right rectus abdominis muscle, and the symptoms of abdominal pain had much improved.

2. Case description

A 45-year-old Taiwanese healthy male, used to be a professional basketball player before. He presented a progressively enlarged black nodule on his right parietal-temple scalp in 2012. Intralesional biopsy proved to be a malignant melanoma. He finally underwent wide excision with 2 cm safe margin with local flap reconstruction and right neck lymph node dissection in October 2012, and the final diagnosis was pT3aN0M0, stage IIA. The postoperative course was uneventful, he was regularly followed up at our outpatient department and had a PET scan check-up every year. There is no local recurrence or distant metastasis, he was in a normal lifestyle and work regularly.

In 2017, he complained of intermittent abdominal sharp pain for 1 to 2 months, and found a palpable soft tissue mass over his right abdomen (Fig. 1A). The magnetic resonance imaging (MRI) study revealed a mass measured $4.6 \times 3.6 \times 9.2$ cm inside the right

rectus abdominis muscle, with T1 weighted image hypointensity, T2 weighted image hyperintensity, contrast enhancement, and low apparent diffusion coefficient. Metastatic melanoma was highly suspected (Fig. 2). Following PET-CT showed a newly developed FDG-avid lesion over the right rectus abdominis (Fig. 3). The radical en-block extraperitoneal resection of 15 cm segmental right rectus abdominis muscle including the tumor was performed, and the anterior sheath of the right rectus abdominis was double duplicated to reinforce the abdomen wall primarily. The resected tumor was a black-gray colored solid mass (Fig. 1B, C, D), which histopathologic reported as metastatic malignant melanoma accompanied by anaplastic individual tumor cells with bizarre nuclei and prominent nucleoli, and immunohistochemical stains revealed positive stain of S-100, Melan-A and HMB45 and BRAF mutation analysis, while negative of CD20, CD3 markers. The postoperative course was smooth, and he was referred for further target therapy according to the national comprehensive cancer network (NCCN) guideline. This case report was prepared according to the ethical guidelines of the 1975 Declaration of Helsinki, the patient had signed informed consent and agreed for the publication of this report. He received oral vemurafenib (Zelboraf) at oncology section after the operation. Newly founded metastatic lesion over liver, rib, and spine was noted by following PET scan 3 months later, but no FDG-avidity lesion over right rectus abdominis. The patient passed away half a year later due to multiple metastasis

3. Discussion

In the United States of America, melanoma represents only 10% of all skin-cancer diagnoses, but at least 65% of deaths that are related to skin cancer are attributed to melanoma.^[1] A low

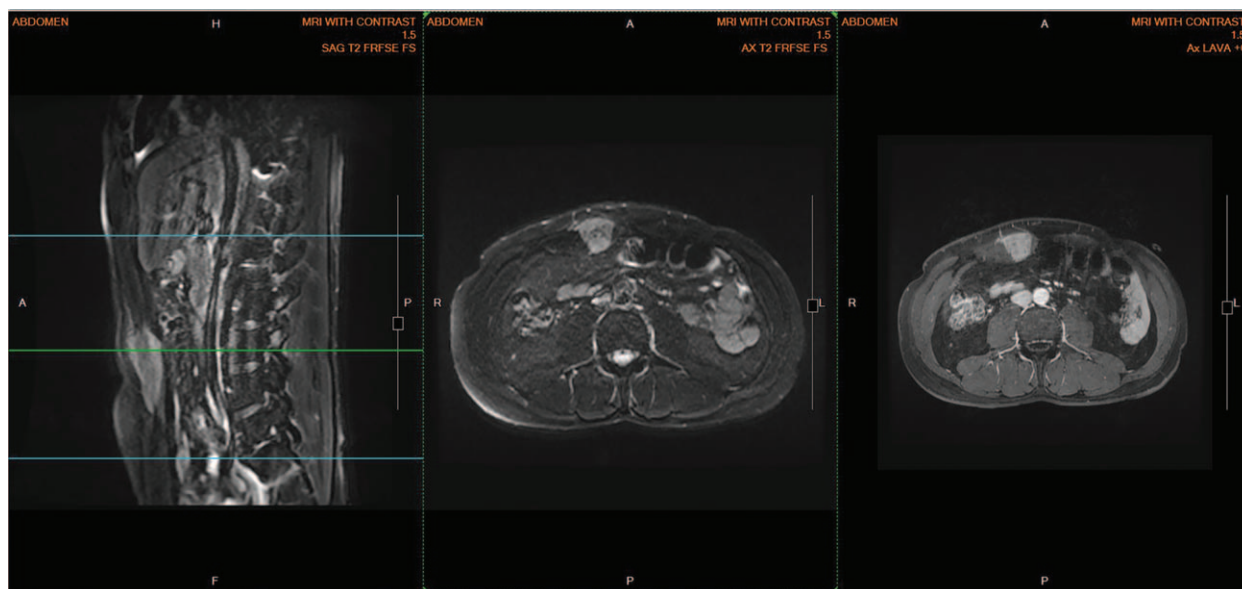


Figure 2. MRI showed a hyperintensity tumor on T2-weighted image with good contrast enhancement over the right rectus abdominis muscle, 4.6 × 3.6 × 9.2 cm showing fat infiltration and peritoneum compression. MRI = magnetic resonance imaging.

incidence (approximately 1/100,000) has been reported in Asian populations. In Taiwan, the 2015 age-adjusted rate for invasive melanoma was 0.85/100,000 for males and 0.65/100,000 for females, accounting for 7% of all skin tumors. Invasive melanoma was also associated with 60% of deaths related to skin tumors.^[2] The main cause of death in melanoma patients is widespread metastases. The most common clinically apparent sites of distant metastases are skin, lung, brain, liver, bone, and intestine.^[3]

Melanoma metastasis to skeletal muscle is relatively uncommon. Moreover, metastatic lesions to the rectus abdominis muscles are extremely rare as only a few reports have been previously issued. Most malignant skeletal muscle metastases are asymptomatic but may on occasion present as painful masses. Silent lesions are usually found incidentally on CT of the chest or abdomen, as they are not linked with clinical signs or symptoms. Previous investigations have identified several muscle-producing factors capable of inhibiting metastatic growth, including adenosine and unidentified low molecular weight factors acting through the A3 adenosine receptor.^[5] Recent animal studies that involve tumor suppression assays revealed that the muscle-mediated tumor suppressor effects do not generate resistant clones but function through the downregulation of the transcription factor microphthalmia-associated transcription factor, a master regulator of melanocyte development and a melanoma oncogene.^[6]

FDG PET and now PET/CT imaging have become mainstream clinical imaging tools for staging, therapy assessment, and follow-up evaluation of patients with a wide variety of malignancies. The more routine use of FDG PET/CT imaging in the oncology setting has led to more frequent detection of asymptomatic lesions, which may have contributed to an increase in diagnosis incidence. Nevertheless, for melanoma stage IIA disease, current NCCN guideline did not recommend routine imaging to screen for asymptomatic recurrence or metastatic disease. In our patient's condition, he had undergone a wide

excision with 2 cm safe margin of his right scalp melanoma and the right neck lymph node dissection (Zone II), initial staging was pT3aN0M0, stage IIA. He had routinely received a PET scan every year without any abnormal findings or metastasis until 5 years postoperatively. He found a palpable mass on right abdominal wall and the MRI and PET scan proved an isolated metastatic lesion. This shows that regular image screening for metastatic disease still play a certain importance in stage IIA disease.

For metastatic melanoma, patients with completely resectable disease, particularly those with long disease-free intervals, should be considered for surgical resection, as it can result in prolonged overall and occasionally relapse-free survival in carefully selected patients.^[7,8] However, most patients with advanced melanoma may not be suitable for an operation at the time of distant metastasis diagnosis and are treated initially with systemic therapies. However, acquired resistance is almost universal in patients treated with targeted agents, and occurs in over 40% of those receiving immunotherapy.^[9] Surgical resection of oligometastatic disease is sometimes useful after systemic therapy as part of a multidisciplinary approach to consolidate the response.^[10] Lastly, surgery should continue to be offered to patients with resectable metastases that are symptomatic, or that may become symptomatic before demise of the patient from their disease.

4. Conclusion

Scalp melanoma with isolated rectus muscle metastasis is extremely rare especially for a young aged patient who had an almost 5-year disease-free period. Surgery with negative resection margins is a potentially curative therapy for patients with isolated metastatic melanoma. Radical compartmental surgery should be considered for selected stage IV melanoma patients with sole rectus abdominis MSMM, whose disease could be amenable to complete resection, in procedures to prolong disease-free survival time. For oligome-

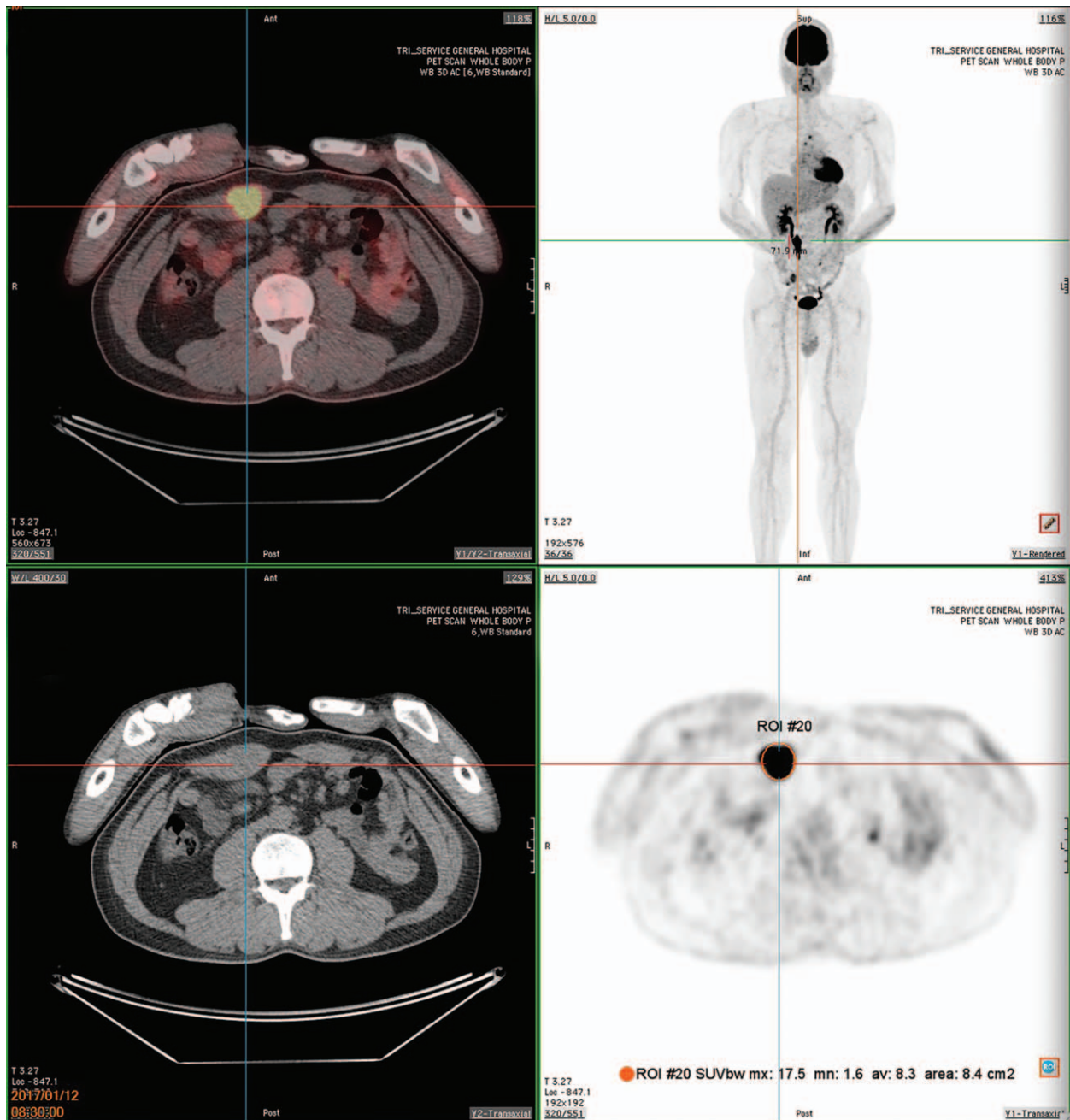


Figure 3. PET/CT image showed a newly developed FDG-avid lesion over the right rectus abdominis (SUV_{max} = 17.5), suspicious for metastatic lesion. FDG = fluorodeoxyglucose, PET/CT = positron emission tomography–computed tomography.

tastatic disease, surgical resection could be performed as symptomatic treatment, and sometimes useful in carefully selected patients after systemic therapy, thus surgery as part of a multidisciplinary approach to consolidate the response is needed.

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