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CASE REPORT

Metastatic Choroidal Melanoma and Liver Metastasis: A Case Report

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Abstract: Metastatic melanoma to liver is rare in adults. Melanoma can arise from the skin and uveal tract of eyes and metastasizes to other organs, including liver. A middle-aged man who had right eye enucleation 5 years ago due to choroidal melanoma was presented with nonspecific abdominal symptoms for a 6-month duration. He had mild tenderness in the right hypochondriac region. An abdominal ultrasound examination showed two hypoechoic lesions that are suggestive of metastatic deposits. Triphasic computed tomography scan of the abdomen showed heterogeneously enhancing lesion that is indicative of hepatoma. Magnetic resonance imaging revealed T2 iso- to hyperintense lesion, giving differential diagnoses of focal nodular hyperplasia, hepatic adenoma, and fibrolamellar carcinoma. Immunohistochemistry results showed that the tumor cells derived from liver biopsy contain melanin as they are positive for both S-100 and MART-1, indicating that the tumor is melanoma. The histopathological examination should be performed on tumor cells from patients who have an increased risk for metastatic melanoma in the liver due to choroidal melanoma.

Keywords: Choroidal melanoma, Liver metastasis

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1 Introduction

Melanoma is a malignant tumor that arises from melanocytes in skin and rarely from the oral cavity, intestines, and the eye (uveal tract)[1]. Melanoma can metastasize to other organs such as lymph nodes, lungs, liver, and sometimes to bones and brain[2]. Primary melanoma of the liver is very rare; so far, not many case reports regarding this type of tumor have been published[3].

Furthermore, many cases of melanoma in the liver are metastatic. Metastases from the skin and uveal tract of the eye are commonly diagnosed even after complete resection of the primary tumor[4]. The choroid is the most common site for uveal melanoma[5]. Based on previous case reports, primary ocular melanoma manifests delayed metastasis to other organs, and the maximum interval between diagnosis of primary choroidal tumor and that of liver metastasis was 23 years[4]. Therefore, liver metastasis is often overlooked.

2 Case presentation

A 53-year-old male taxi driver who complained of vague upper abdominal pain, sporadic vomiting for 1 year, and undocumented mild weight loss was referred to our clinic. He had a history of the right eye enucleation 5 years ago due to biopsy-proven choroid melanoma. Apart from the enucleation of the right eye and mild tenderness in the right hypochondriac region, we did not obtain any significant finding of the body check. The circulation of his retina and choroid was examined using fundus fluorescein angiography in Peshawar (Pakistan) 5 years ago. Figure 1 shows a photograph of a collection of fundus fluorescein angiography images.

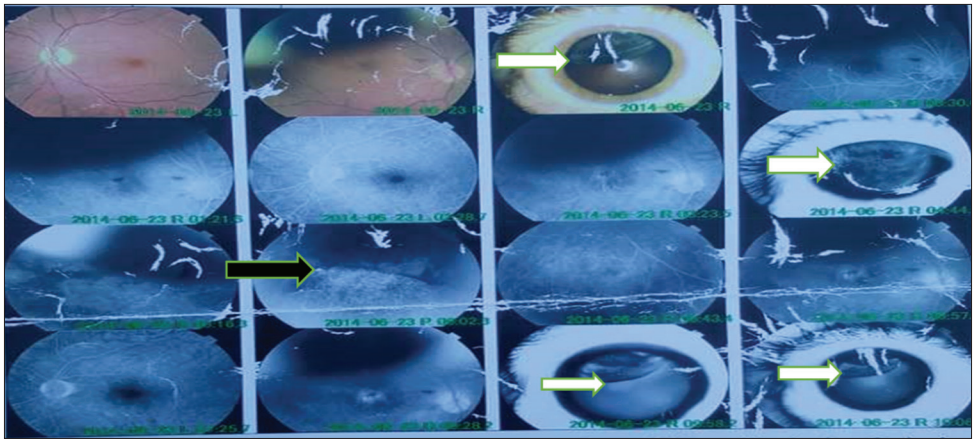

Figure 1. Fundus fluorescein angiography shows a large choroidal brown mass at superotemporal region in the right eye, masking the view of the retina in that region (white arrows). Cystoid macular edema with retinal hemorrhage that is noted at macula along with disc leakage due to neovascularization of the optic disc (black arrow).

He was subject to a series of tests, including blood tests, ultrasound imaging, computed tomography (CT) scan, and magnetic resonance imaging (MRI) in an institute outside Pakistan. Based on his previous blood test report, his complete blood count results were normal with hemoglobin at 13.8 g/dL, white blood cell count 8.4×10^9/L, and platelets 354×10^9/L. Liver function test was normal with total bilirubin at 0.57 mg/dl, alanine aminotransferase 18 U/L, alkaline phosphatase108 U/L, gamma-glutamyl transferase 17 U/L, and aspartate aminotransferase14 U/L. Erythrocyte sedimentation rate and serum albumin were also normal. He was also tested negative for hepatitis B surface antigen, anti-hepatitis C virus antibody, and human immunodeficiency virus. His alpha-fetoprotein level was normal (2.96 ng/mL).

The initial ultrasound scan of the abdomen showed a well-defined isoechoic lesion with a hypoechoic rim of 3.3 × 3.5 × 2.9 cm in the left lobe of the liver. CT scan, coupled with oral and rectal contrast rather than CT liver protocol, has been done outside of Pakistan. CT scan showed a well circumscribed hypodense lesion (44HU) in segment IV A of liver that measures approximately 3.5 × 3.0 × 3.4 cm (anteroposterior × transverse × craniocaudal) in dimensions. It showed minimal central amorphous hyperintensity on plain CT scan, no appreciable enhancement on arterial phase (46HU), and progressive centripetal enhancement on the venous phase (74 HU). The peripheral puddling of contrast (84HU) was evident in delayed images with a hypodense center. These findings were suggestive of hepatic hemangioma. The liver had normal size and attenuation.

As symptoms such as abdominal pain and vomiting were not responding to symptomatic treatment such as proton pump inhibitors and anti-emetics, he underwent abdominal MRI which showed well-defined T2 iso- to hyperintense and T1 hyperintense lesion (approximately 3.7 × 3.5 × 3.8 cm) in the left lobe of the liver. These imaging findings were unable to help distinguish the pathology, thereby giving three different diagnoses of focal nodular hyperplasia, hepatic adenoma, and fibrolamellar carcinoma. Another small T2 hyperintense and T1 hypointense lesion (approximately 7 × 6 mm) seen in segment V/VI of the right lobe of the liver which was suggestive of small hemangioma.

Due to the constant mild weight loss and the non-improvement of symptoms, he returned to Pakistan, his native country, and repeated abdominal ultrasound examination and CT scan in an institute of Karachi, Pakistan, which is outside our hospital. We obtained the consent of the patient to use the photographs of ultrasound and CT scans that were performed outside our hospital in the current case presentation.

The repeated ultrasound scan revealed two hypoechoic lesions at the junction of the right and left lobes of the liver. The largest one measures 6.9 × 5.6 cm and shows flow on color Doppler ultrasound study, indicating metastatic lesions (Figure 2). As compared to the previous ultrasound scan, there was an increase in the size of lesions which were alarming.

Repeated triphasic CT scan of the abdomen revealed well-defined, round heterogeneously enhancing lesion (approximately 7.0 × 6.8 cm) in the liver. This finding was suggestive of hepatoma. On the other hand, another ill-defined small lesion, which measured approximately 0.8 x 0.9 cm in the liver, was suggestive of hemangioma (Figure 3).

Gastroscopy and colonoscopy were performed. The normal findings of these endoscopic examinations rule out gastrointestinal malignancy as the origin of metastasis. He was then referred to our department with the findings from all of the above-mentioned investigations and we decided to perform liver biopsy to pursue a definitive diagnosis of the lesion. The findings from the first ultrasound-guided liver biopsy were nonspecific and inconclusive (Figure 4).

Since the biopsy findings were inconclusive, we decided to repeat biopsy after discussing with the patient and his

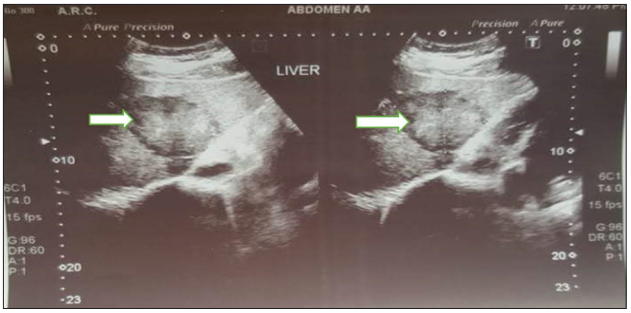

Figure 2. Ultrasound scan of the upper abdomen. The scan shows two hypoechoic lesions at the junction of the right and left lobes of the liver (white arrows).

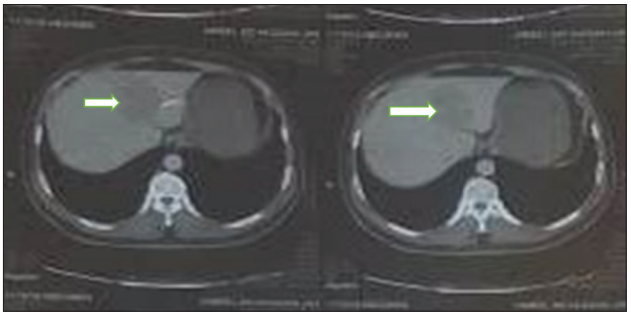

Figure 3. Triphasic computed tomography scan of the abdomen showing hypodense mass lesion in the liver (arrows).

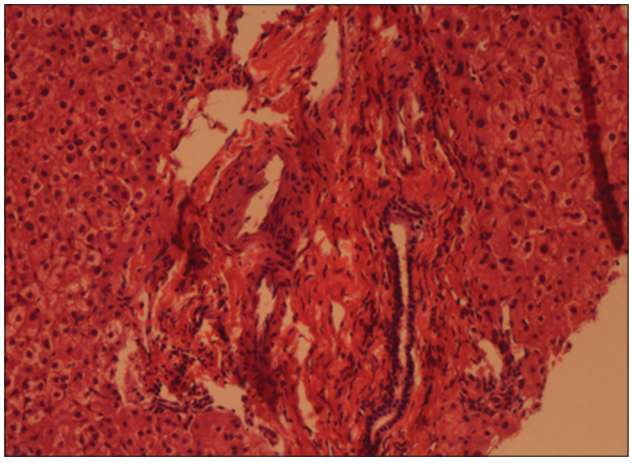

Figure 4. Core of liver parenchyma showing portal tract with minimal infiltration by mononuclear inflammatory cells.

family. Later, an endoscopic ultrasound-guided biopsy was performed, and the results of which showed multiple liver lesions in the left lobe of the liver. The histopathological investigation also revealed a few tiny fragments of neoplastic lesion that is comprised cells containing melanin pigment. Furthermore, immunohistochemistry staining suggests that this lesion is a melanoma as the cells were positive for S-100 and MART-1 (Figure 5). Considering his prior history of choroidal melanoma, this lesion was most likely metastatic rather than of liver origin. He was then referred to an oncologist for further management.

3 Discussion

Melanoma is malignant in nature and can metastasize to a number of organs both through lymphatic and blood vessels[6]. It is noteworthy that the incidence of melanoma is rising and factors that lead to the pathogenesis of melanoma include sun exposure and UV light[7]. Uveal melanoma is the second most common malignant melanoma which spreads through blood vessels as it lacks lymphatic drainage[8]. Choroidal melanoma is a form of uveal melanoma, but it is not a prevalent disease in Pakistan. The liver is the most common site of metastasis in the gastrointestinal tract[9], but metastatic melanoma of liver is rare yet rapidly progressive[10]. The diagnosis of metastatic melanoma is challenging because it does not have specific radiological characteristics. In this regard, histopathological investigation is mandatory for diagnosis.

Various modalities, including non-invasive techniques (e.g., triphasic CT of the abdomen and MRI) and invasive procedures such as liver biopsy, can be used to detect liver lesions. Although multiple imaging techniques were used in this case study, a clear diagnosis was failed to be made. This is because the imaging modalities are sometimes unable to give characteristic findings that could distinguish disease or condition from others that present similar clinical features. Although liver biopsy is still the gold standard for the diagnosis of liver disease, it is subjective and operator-dependent. As evident in this case study, the lesion of tissue core obtained in the first biopsy was overlooked. Since the findings of CT scan and MRI were already inconclusive, we opted for repeat liver biopsy. The patient chose endoscopic ultrasound-guided biopsy which is the least invasive procedure from among other choices such as ultrasound-guided biopsy and laparoscopic-guided biopsy of liver lesion.

Histopathological investigation showed that hyperchromatic tumor cells contain melanin pigment and are positive for markers of melanoma such as S-100 and MART-1. S-100 is a marker of neural tissue or lesions and melanoma. Of the S-100 protein family, S-100B is specific for melanoma. The S-100 protein is expressed in melanocytes and 96–100% of malignant melanomas[11]. MART-1 is a protein found in the normal melanocytes of the skin and retina. MART-1is more specific than S-100in the detection of melanoma, and it can distinguish melanoma from other malignancies[12].

Treatment options for melanoma include surgical resection, chemotherapy, and immunotherapy[13]. Immunotherapy involving the use of ipilimumab is gaining attention for the management of advanced melanomas nowadays. If used in combination with other treatment modalities, it may increase the overall survival rate. In this case study, the patient could have been offered definitive surgical excision of the lesion if the diagnosis can be confirmed early. Unfortunately, confirmation of diagnosis was delayed due to the heterogeneous imaging findings.

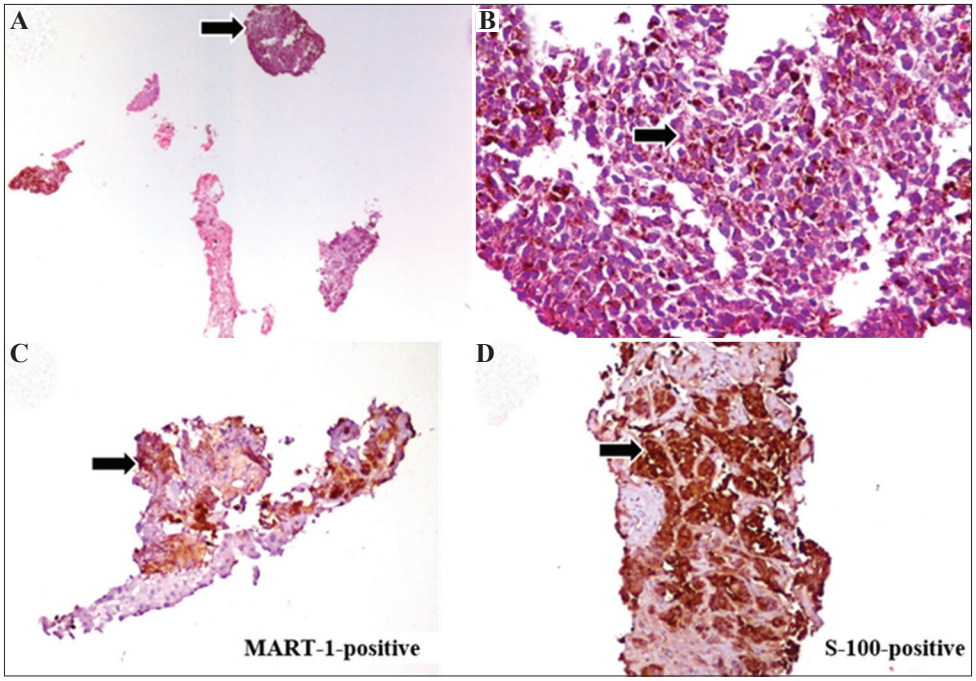

Figure 5. Histopathological investigation of liver biopsy. (A) Core of liver parenchyma with neoplastic cells at 10× magnification. (B) Individual tumor cells containing melanin pigments at 40× magnification. (C) Tumor cells that are positive for MART-1. (D) Tumor cells that are positive for S-100.

Since these lesions are rapidly growing in nature[14], the size of lesion in our patient was almost doubled since the time of initial clinical manifestation, along with the development of multiple lesions. Thus, this patient was referred to a medical oncologist for chemotherapy or immunotherapy.

Patients with metastatic uveal melanoma to the liver generally have a poor prognosis[15]. Metastasis can occur even years after the complete treatment of the primary lesion. Several cases reported that the duration from diagnosis of the primary lesion to metastasis is 3–23 years[4]. At the time of performing the repeat biopsy, it had been 5 years since the patient, as described in this case report, was diagnosed with the primary melanoma. Patients with metastasis to liver have an expected survival duration of 6–9 months, which can be extended up to 46–48 months if they were treated[16]. To the best of our knowledge, at the time of the publication of this case report, the patient has been alive since the diagnosis of metastatic choroidal melanoma to the liver and is receiving immunotherapy in the oncology department.

4 Conclusion

Metastatic choroidal melanoma to liver is a very rare incidence. Thus, this could be easily overlooked during the investigation if only imaging modalities were used. To accelerate diagnosis and treatment, rapid histopathological examination involving the immunostaining of S-100 and MART-1 should be indicated for patients having history of liver lesion and visual loss due to choroidal tumor.

Acknowledgments

Not applicable.

Conflicts of interest

The authors declare that they have no competing interests.

Author contributions

S.S.S. performed the diagnosis, reviewed, and edited the manuscript. R.K. gathered the data and images and wrote the manuscript. Both authors read and approved the final manuscript.

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