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Case Report

Imaging Features of Primary Hepatic Melanoma: A Rare Hepatic Malignancy

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Abstract

Melanoma is a malignant tumor that primarily arises at the dermoepidermal junction or within melanocyte-rich tissues, including the skin, mucous membranes, as well as certain ocular structures (ciliary body, iris, choroid) and the meninges. Although the liver is a common site of metastatic spread for melanoma, primary hepatic melanoma remains exceedingly rare, with only a limited number of cases reported in the literature. The diagnosis of primary hepatic melanoma remains challenging due to the lack of specific clinical and radiological features, and it is a diagnosis of exclusion, because the liver is usual site of melanoma metastasis, the diagnosis is based on radiological exams that include ultrasound, Ct scan, MRI, the definitive diagnosis is based on histology, therefore a biopsy will be indicated.

It is usually asymptomatic, when symptoms occur, they manifest by right upper quadrant abdominal pain, hepatomegaly, Unintentional weight loss, nausea.

Keywords: *Primary Hepatic Melanoma; Melanocytes; Primary Tumor of Liver; Non-Cutaneous Melanoma*

Introduction

Malignant melanoma is a neoplasm arising from melanocytic cells. Pathological and molecular studies have demonstrated that it is a relatively rare malignancy characterized by highly aggressive biological behavior. Importantly, malignant melanoma does not represent a single homogeneous entity, but rather a heterogeneous group of tumors with diverse etiopathogenic mechanisms, biological profiles, and prognostic outcomes [1].

Over recent decades, the incidence of melanoma has risen markedly among both men and women worldwide [2].

Melanoma most commonly arises at the dermoepidermal junction or within tissues containing abundant melanocytes, including the skin, mucosal surfaces, uveal tract of the eye (ciliary body, iris, and choroid), and the meninges [3].

Malignant melanoma is associated with a high risk of recurrence and metastatic dissemination, resulting in an overall unfavorable prognosis. Metastatic spread is common and represents a major determinant of disease outcome [4].

Metastatic involvement of the liver from abdominal melanoma is frequent, whereas primary hepatic melanoma is exceptionally rare [5].

Malignant melanoma typically arises in middle-aged and elderly individuals, most frequently involving the skin and only rarely affecting internal organs. Primary hepatic melanoma is exceptionally uncommon, and its imaging characteristics are only sparsely described in the literature [6].

Case Report

A 66 year old woman with no specific past medical history, presented to our hospital "National Institute of Oncology", with a dorsalgia associated with those signs; progressive abdominal distention, unintentional weight loss and anorexia, that had evolving over approximately. Clinical examination revealed on inspection three abdominal bulges. On palpation, a painful, immobile mass was noted in the right hypochondrium, as well as a painful, immobile mass in the right flank. In addition, a painful mass was found to be mobile throughout the abdomen in all planes. On percussion, flank dullness was present.

The patient's laboratory evaluation revealed an abnormal liver profile, with alanine aminotransferase (ALT) levels elevated to twice the upper limit of normal, and increased total bilirubin, including the conjugated fraction. The complete blood count and coagulation profile were otherwise within normal limits.

Cervico-thoraco-abdomino-pelvic (CTAP) contrast-enhanced CT (See figures below) revealed hepatomegaly with irregular, lobulated contours due to the presence of multiple large hypodense hepatic masses, some of which were confluent and demonstrated heterogeneous enhancement following contrast administration. The largest lesions involved segment IVb (88 × 63 mm) and segment III (81 × 89 mm). Several masses exhibited close relationships with adjacent structures, including a mass effect on the left intrahepatic bile duct, which was dilated to 7 mm, intimate contact with the right cardiac chambers-particularly the right atrium-which were displaced without a visible intervening fat plane in some areas, displacement of the right rectus abdominis muscle causing bulging of the right flank, and posterior displacement of the stomach with focal obliteration of the intervening fat plane, in addition to hilar adenopathy measuring 10 mm of short axis, a hypodense subcapsular collection is also noted across hepatic segments V and VIII, suggestive of a chronic subcapsular hepatic hematoma.

On the other hand CT demonstrated metastatic bone involvement characterized by a lytic soft-tissue lesion involving the D9 vertebral body and an extensive lytic soft-tissue lesion centered on the sacrum, involving the S2, S3, and S4 vertebral segments, with subtle extension into the sacral canal. A minimal amount of peritoneal effusion was also noted (See figures below).

An ultrasound-guided biopsy of the hepatic lesion was performed, yielding small tissue fragments that were submitted to the pathology department of the National Institute Hospital.

Histopathological examination and immune-histochemical analysis confirmed the diagnosis of primary hepatic melanoma (See figures below).

The patient was subsequently referred for palliative chemotherapy and radiotherapy in the setting of advanced primary hepatic melanoma.

Discussion

Melanoma is an uncommon malignancy characterized by highly aggressive biological behavior. While metastatic dissemination-particularly to lymph nodes and the liver-is frequent, primary hepatic melanoma remains exceedingly rare and is associated with a poor

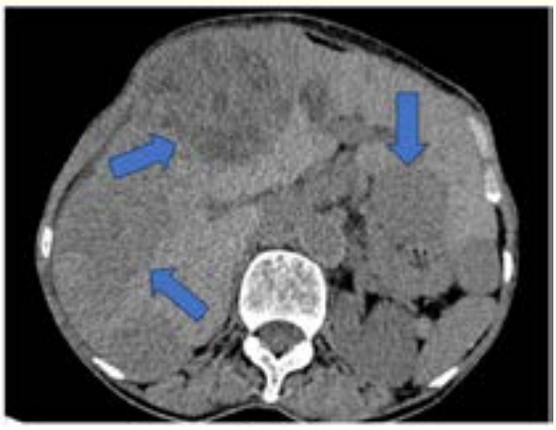

Figure 1: *Axial contrast-enhanced CT scan demonstrating marked hepatomegaly with multiple disseminated heterogeneous hypodense lesions (blue arrows) involving both hepatic lobes, reflecting extensive hepatic tumor burden in a patient with primary hepatic melanoma.*

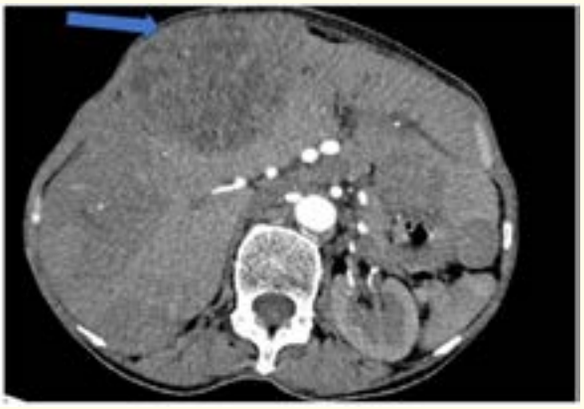

Figure 2: *Axial arterial-phase contrast-enhanced CT image showing hepatomegaly with multiple disseminated hepatic lesions demonstrating subtle heterogeneous enhancement. A large segment IVb lesion causes displacement of the right rectus abdominis muscle and bulging of the right flank (Blue arrow).*

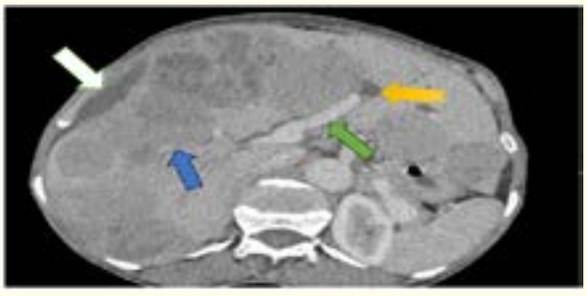

Figure 3: *Axial portal venous-phase contrast-enhanced CT image demonstrating multiple hepatic lesions with prominent progressive enhancement (blue arrow). One lesion causes mass effect on the left biliary and portal structures (green arrow), associated with upstream dilatation of the intrahepatic bile ducts, measuring up to 7 mm in diameter (yellow arrow). Additionally, a hypodense subcapsular collection spanning hepatic segments V and VIII is noted, consistent with a chronic subcapsular hepatic hematoma (White arrow).*

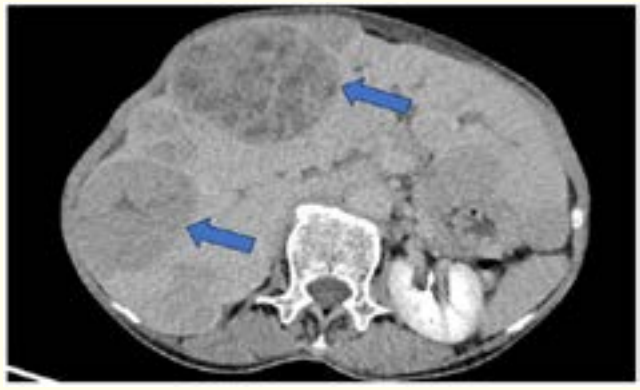

Figure 4: *Axial delayed-phase contrast-enhanced CT image demonstrating multiple hepatic lesions with persistent heterogeneous enhancement and no evidence of washout, reflecting delayed contrast retention within the lesions (Blue arrows).*

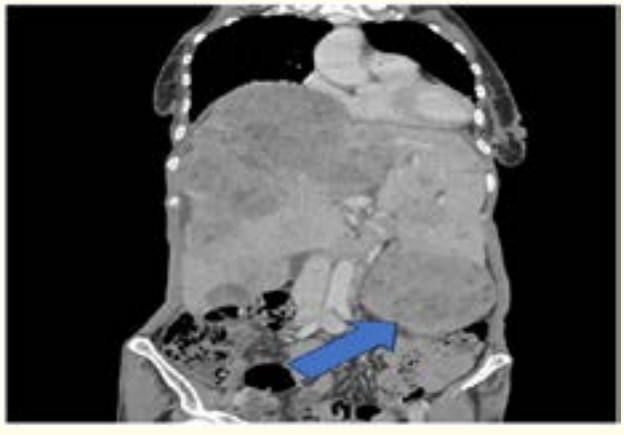

Figure 5: *Coronal portal venous-phase contrast-enhanced CT image demonstrating hepatomegaly with multiple disseminated hepatic lesions. The largest lesion is exophytic, arising from segment III, projecting into the intraperitoneal cavity and (Blue arrow).*

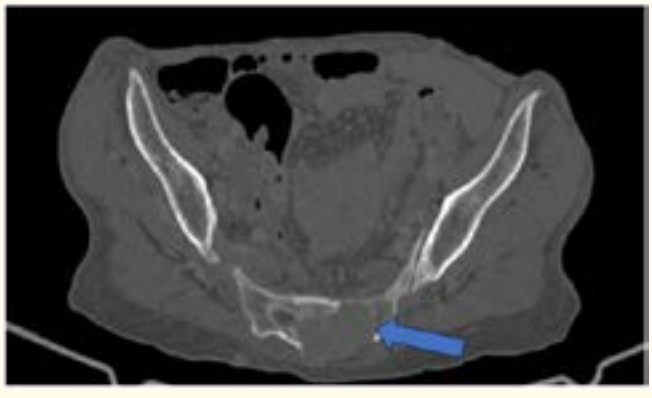

Figure 6: *Axial portal venous-phase pelvic CT scan (bone window) demonstrating a tissue-density lytic lesion of the sacrum (blue arrow), with cortical destruction and extension into the sacral canal, resulting in invasion of the canal contents including the sacral nerve roots.*

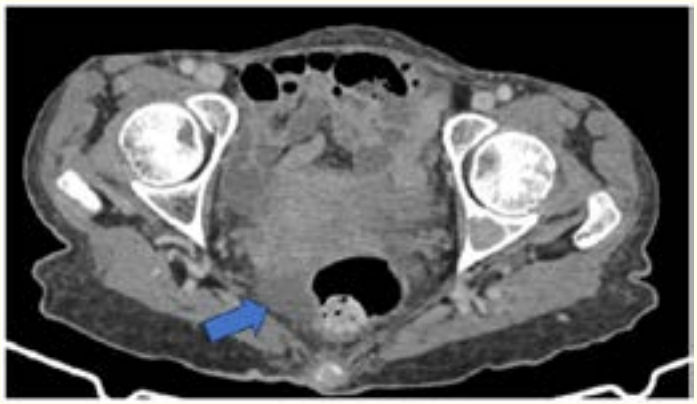

Figure 7: *Axial portal venous-phase pelvic CT scan demonstrating a minimal amount of peritoneal fluid (minimal ascites) within the pelvic cavity (Blue arrow).*

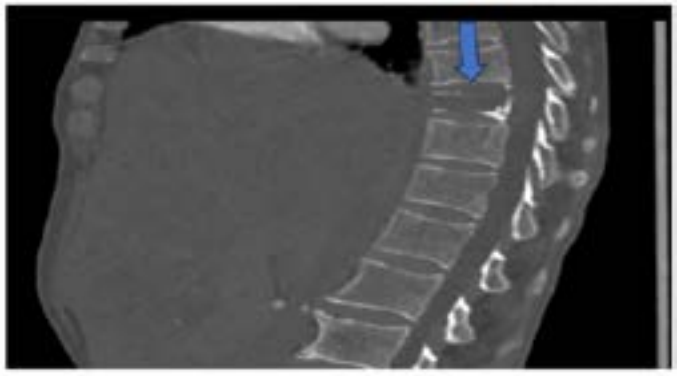

Figure 8: *Sagittal reformatted CT scan of the dorsal spine demonstrating a severe compression fracture of the D9 (Blue arrow).*

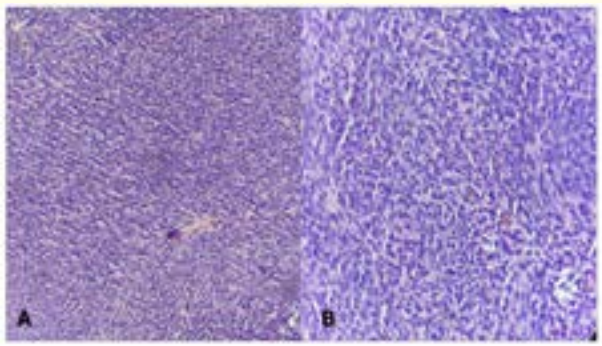

Figure 9: *Histologic examination shows a malignant proliferation of spindle-shaped cells arranged in diffuse sheets and poorly cohesive fascicles. The tumor cells exhibit marked cytologic atypia with elongated hyperchromatic nuclei, irregular nuclear contours, and variably prominent nucleoli. The architecture is predominantly solid and non-nested, without evidence of maturation, and mitotic activity is readily identified. (Figure A: HE ×200; Figure B: HE, ×400).*

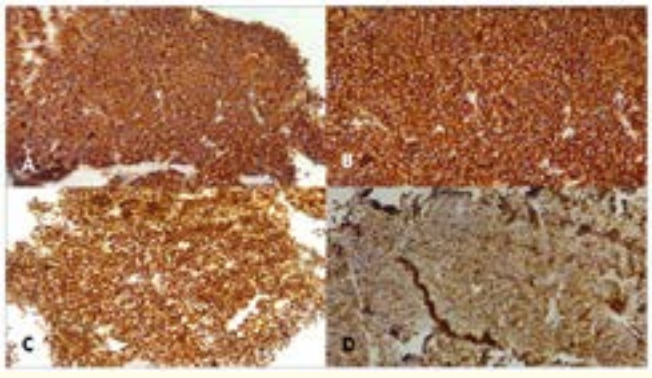

Figure 10: *Tumor cells from a spindle cell melanoma show immunohistochemical positivity with membranous expression of HMB45 (Figure A, ×200) and Melan-A (Figure B, ×400), nuclear expression of SOX10 (Figure C, ×200), and less intense S100 protein positivity (Figure D, ×200).*

prognosis, with survival typically ranging from several months to a few years. Its diagnosis based on clinical presentation and imaging modalities is challenging due to its nonspecific and ambiguous features [7]. Primary hepatic melanoma is an exceptionally rare entity, with only sporadic cases documented in the literature. Its preoperative diagnosis remains difficult, largely owing to the low clinical suspicion and the absence of specific presenting features [7].

Moreover, malignant melanoma does not represent a single disease entity; instead, it comprises a heterogeneous group of neoplasms characterized by diverse etiopathogenic mechanisms, biological behaviors, and prognostic outcomes [1].

Primary hepatic melanoma is an exceptionally rare entity, with fewer than 15 cases reported in the literature to date (Table 1). Available data indicate a low prevalence in Western countries, with the majority of reported cases occurring in Asian populations [7].

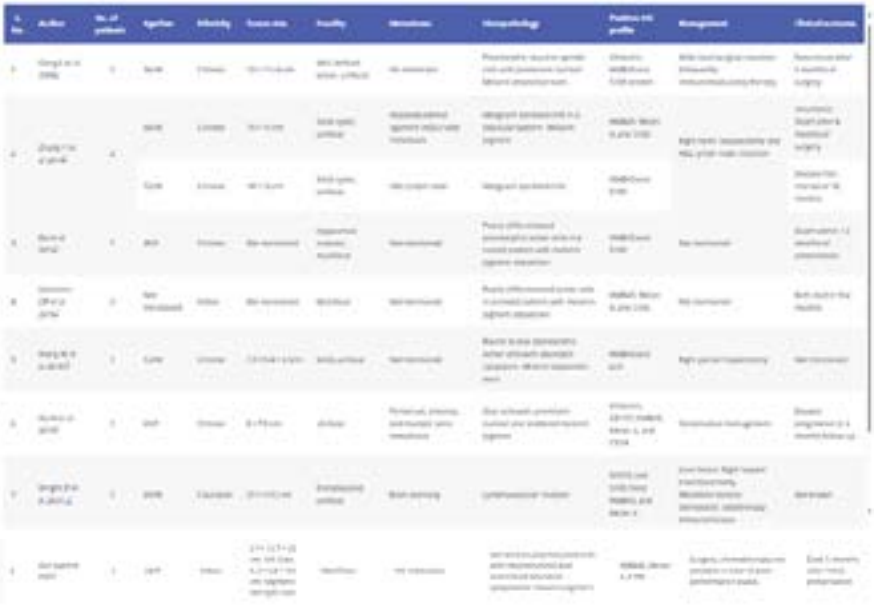

Table 1: *Review of literature with clinicopathological features of reported examples of primary hepatic melanoma [7].*

Melanoma is a relatively uncommon malignant tumor characterized by a poor prognosis. In recent decades, its incidence has increased in both men and women, Approximately, 90% of melanomas arise from cutaneous sites. While locoregional and distant metastases, including to the liver, are relatively frequent, primary hepatic melanoma remains an exceptionally rare entity [1,8,9].

Primary hepatic melanoma is exceedingly rare, and the limited number of reported cases makes it difficult to establish a precise median age at diagnosis. However, based on published case reports and small series, the median age is generally estimated to be around 45 - 50 years, with cases reported across a wide age range (approximately 20 to 80 years), slightly concordant with the age of our patient [10].

Primary hepatic melanoma appears to affect both genders, with a slight male predominance reported in the literature. However, given the limited number of documented cases, no definitive gender distribution has been established [10].

The pathogenesis is not well established, it has been hypothesized that primary hepatic melanoma originates from ectopic melanocytes within the liver [10,12]. To date, no universally accepted diagnostic criteria have been established. Nevertheless, proposed diagnostic criteria generally include: (a) histological and immunohistochemical confirmation of hepatic melanoma; (b) absence of a prior cutaneous melanoma, including lesions that may have regressed or been excised without histological evaluation; and (c) exclusion of a primary melanoma at any other anatomical site [13].

Primary hepatic melanoma typically presents with non-specific clinical manifestations, most commonly including right upper quadrant abdominal pain, abdominal distension, weight loss, anorexia, and fatigue. Jaundice may occur in advanced cases due to biliary compression. In some patients, the lesion is incidentally detected on imaging studies. Overall, the clinical presentation is not specific and cannot be distinguished from that of other primary or metastatic hepatic tumors [14]; these findings are consistent with those observed in our patient.

Overall, due to its rarity, there is no consensus on optimal management, and the prognosis of primary hepatic melanoma remains poor. Early diagnosis and complete surgical resection appear to be the most important prognostic factors [10,13].

The laboratory findings in our patient demonstrated mild cytolysis and cholestasis, in contrast to the case reported by R. Krishan, which described normal hepatic function [7].

Histologically, primary hepatic melanoma demonstrates a heterogeneous morphological spectrum, with tumor cells exhibiting either epithelioid or spindle-cell features and variable, sometimes absent, melanin pigmentation. Mitotic activity is often prominent, reflecting a high proliferative index. In challenging amelanotic cases, immunohistochemical profiling is essential to confirm the diagnosis [16]. In the present case, immunohistochemistry showed a compatible melanocytic profile, with positivity for HMB45 and Melan-A, nuclear expression of SOX10, and focal S100 protein positivity, thereby supporting the diagnosis of spindle cell melanoma.

There is currently no universally accepted diagnostic consensus for primary hepatic melanoma. Nevertheless, proposed diagnostic criteria rely on three key elements: (a) histological and immunohistochemical confirmation of hepatic melanoma, (b) absence of any prior cutaneous melanoma (including lesions that may have been excised or regressed without histological evaluation), and (c) exclusion of a primary melanoma at other anatomical sites [13]. Our patient fulfilled all three criteria.

From a radiological perspective, features suggestive of primary hepatic melanoma include an enhancing hepatic lesion during both the arterial and portal venous phases on CT, as well as a heterogeneous hyperintense signal on T1-weighted MRI and a hypointense signal on T2-weighted sequences [13].

Radiologically, primary hepatic melanoma typically manifests as a solitary, heterogeneous hepatic mass with variable internal architecture. On contrast-enhanced computed tomography, the lesion is most often hypodense on non-contrast images and demonstrates heterogeneous or progressive enhancement during the arterial and portal venous phases, sometimes associated with areas of necrosis, hemorrhage, or vascular invasion. Notably, the CT findings observed in our case were concordant with these described features. Magnetic resonance imaging provides additional diagnostic clues, particularly related to melanin content: lesions frequently exhibit intrinsic hyperintensity on T1-weighted sequences and relative hypointensity on T2-weighted images, reflecting the paramagnetic properties of melanin. Diffusion-weighted imaging may show restricted diffusion, and post-contrast sequences generally reveal persistent or heterogeneous enhancement. Although these imaging features are not pathognomonic, their combination-especially the characteristic T1 hyperintensity and T2 hypointensity-should raise suspicion for primary hepatic melanoma in the appropriate clinical context [13].

Primary hepatic melanoma is an exceptionally rare and aggressive malignancy, and its prognosis is generally poor, mainly due to delayed diagnosis and the lack of standardized therapeutic guidelines. Most patients present at an advanced stage, often with unresectable disease or occult metastases, which significantly worsens outcomes. Reported survival is usually limited, ranging from a few months to rarely exceeding one year in disseminated cases [10,13].

Surgical resection remains the only potentially curative treatment in cases of localized disease. Several reports suggest that partial hepatectomy can improve survival in carefully selected patients without extrahepatic involvement; however, recurrence remains frequent even after complete resection, reflecting the aggressive nature of melanoma [13].

In advanced or unresectable cases, management is largely extrapolated from cutaneous melanoma. Systemic therapies, particularly immune checkpoint inhibitors such as anti-PD-1 and anti-CTLA-4 agents, as well as targeted therapies in the presence of specific mutations (e.g. BRAF), have demonstrated efficacy in metastatic melanoma and may provide benefit in PHM, although current evidence is limited [3,15]. Locoregional approaches, including transarterial chemoembolization or radiofrequency ablation, have been reported as palliative options, but their impact on overall survival remains unclear [10]. In our case, the presence of hepatic, osseous, and peritoneal metastatic disease precluded curative treatment; therefore, the patient was managed with palliative chemotherapy and radiotherapy aimed at symptom control and disease stabilization.

Conclusion

Primary hepatic melanoma is an exceptionally rare entity with no universally established diagnostic criteria, posing significant clinical and radiological challenges. Its diagnosis remains one of exclusion, relying on histopathological and immunohistochemical confirmation in conjunction with the absence of a primary melanoma elsewhere. Imaging plays a pivotal role in raising suspicion, particularly when characteristic features such as T1-weighted hyperintensity and T2-weighted hypointensity are observed on MRI, alongside heterogeneous enhancement patterns on CT. However, these findings are not pathognomonic and must be interpreted within the appropriate clinical context. Given its rarity, the prognosis is difficult to standardize, and optimal management strategies are not well defined, although surgical resection, when feasible, appears to offer the best outcomes. Further accumulation of well-documented cases is essential to improve understanding, refine diagnostic criteria, and guide therapeutic approaches for this uncommon malignancy.

Bibliography

1. Ryška A., *et al*. "Malignant melanoma-from classical histology towards molecular genetic testing". *Klinicka Onkologie: Casopis Ceske a Slovenske Onkologicke Spolecnosti* 30.3 (2017): 182-189.

2. Berwick M., *et al*. "Melanoma epidemiology and prevention". In Melanoma Cham: Springer International Publishing (2015): 17-49.

3. Kamel IR., *et al*. "Imaging of abdominal manifestations of melanoma". *Critical Reviews in Diagnostic Imaging* 39.6 (1998): 447-486.

4. Meyer T., *et al*. "Effect of melanoma cells on proliferation and migration of activated hepatic stellate cells *in vitro*". *Pathology-Research and Practice* 213.4 (2017): 400-404.

5. Braat MNGJA., *et al*. "The role of 90Y-radioembolization in downstaging primary and secondary hepatic malignancies: a systematic review". *Clinical and Translational Imaging* 4.4 (2016): 283-295.

6. Ao W., *et al*. "Primary hepatic melanoma: A case report of computed tomography and magnetic resonance imaging findings". *Medicine* 98.25 (2019): e16165.

7. Krishan R., *et al*. "Primary hepatic melanoma: a diagnostic surprise". *International Journal of Surgical Pathology* 33.1 (2025): 117-124.

8. Murali S., *et al*. "Melanoma epidemiology and prevention". Melanoma: A modern multidisciplinary approach (2018): 27-37.

9. Petralia G., *et al*. "Whole-body diffusion-weighted imaging: is it all we need for detecting metastases in melanoma patients?". *European Radiology* 23.12 (2013): 3466-3476.

10. Ao W., *et al*. "Primary hepatic melanoma: A case report of computed tomography and magnetic resonance imaging findings". *Medicine* 98.25 (2019): e16165.

11. Baab GH and McBride CM. "Malignant melanoma: the patient with an unknown site of primary origin". *Archives of Surgery* 110.8 (1975): 896-900.

12. Song EJ., *et al*. "Primary oesophageal melanoma-a case report". *World Journal of Surgical Oncology* 12.1 (2014): 77.

13. Zhang Y., *et al*. "Partial hepatectomy for primary hepatic melanoma: a report of two cases and review of the literature". *World Journal of Surgical Oncology* 12 (2014): 362.

14. Du F., *et al*. "Primary hepatic malignant melanoma: a case report". *International Journal of Clinical and Experimental Pathology* 8.2 (2015): 2199.

15. Gershenwald JE., *et al*. "Melanoma staging: evidence-based changes in the American Joint Committee on Cancer eighth edition cancer staging manual". *CA: A Cancer Journal for Clinicians* 67.6 (2017): 472-492.

16. Bakhti M., *et al*. "Primary hepatic melanoma: a case report". *Cureus* 18.3 (2026): e105195.

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