Acta Scientific MEDICAL SCIENCES (ISSN: 2582-0931)

Volume 8 Issue 9 September 2024

Case Report

Solitary Bone Metastases of the Thoracic Spine at Th-11 from Uveal Malignant Melanoma: A Rare Entity and Literature Review - A Rare Case Report

Luljeta Abdullahu[1]*, Armend Jashari[1], Naser Gjonbalaj[2], Fisnik Kurshumliu[3], Nimet Orqusha[4], Brunilda Haxhiu[5], Basri Lenjani[6], Ilir Kurtishi[5], Ylli Kaçiu[1,2], Fitore Murati[7] and Vjollca Dedushaj Fazliu[8]

[1]Nuclear Medicine Department - University Clinical Center of Kosovo, Republic of Kosovo

[2]Clinic of Radiology, University Clinical Center of Kosovo

[3]Institute of Pathology-University Clinical Center of Kosovo, Republic of Kosovo

[4]Professor, Assistant Dr. Faculty of Medicine, University of Prishtina "Hasan Prishtina", Prishtina, Republic of Kosovo

[5]Oncology Clinic, University Clinical Center of Kosovo, Republic of Kosovo

[6]Emergency Clinic, University Clinical Centre of Kosovo, Republic of Kosovo

[7]Physiotherapeutic - University Clinical Center of Kosovo, Republic of Kosovo

[8]Internal Medicine - Endocrinologist Private Praxis "Vital Health Group" Agim Ramadani n.n. Republic of Kosovo

***Corresponding Author:** Luljeta Abdullahu and Armend Jashari, Nuclear Medicine Department -University Clinical Center of Kosovo, Republic of Kosovo.

DOI: 10.31080/ASMS.2024.08.1911

Received: July 18, 2024

Published: August 23, 2024

Abstract

The aim of this study is to present a rare case of a patient with uveal malignant melanoma who presented with solitary metastases to the thoracic vertebra three years after eye enucleating. Bone metastasis from retinal melanoma is extremely rare and is usually associated with involvement of organs primarily in the liver or lungs.

We report a rare case of a patient with malignant (ocular) melanoma who presented with a single (solitary) metastasis to the thoracic vertebra (Th-11) three years after enucleating, without involvement of other organs. Imaging studies included computed tomography (CT), MRI, whole-body bone scan with 99mTc-MDP, and confirmation via core biopsy.

Discussion: Early detection and a multidisciplinary approach are very important in the management of patients with bone metastases from malignant melanoma.

Conclusion: The involvement of specialists from different fields such as radiology, pathology, medical oncology, radiation oncology, and surgical oncology can lead to a better outcome for the patient. In our case radiation and operative surgery could benefit for patients with solitary bone metastasis to achieve long-term survival.

Keywords: Uvula Melanoma; CT Scan; MRI; Whole Body Bone Scan; 99mTc-MDP; Dual Head Gamma Camera Siemens; Biopsy

Introduction

Malignant melanoma represents only 3% of all melanomas and its incidence is increasing worldwide [1,2]. It occurs in about five to seven individuals per million. Uveal melanoma (UM) arises from melanocytes located in the choroid layer between the sclera and the retina. Although it is the most common primary eye tumor, only about 2,500 cases are diagnosed per year in the United State [3]. Despite optimal treatment (surgical or radiation), metastases often develop within an average period of 24-48 months and are associated with poor survival. Bone metastases from malignant melanoma are less frequent than liver or brain metastases, ranging from 11% to 17% [4].

Metastasis of malignant melanoma of ciliary origin can spread from local extension, lymphatic vessels, or blood circulation, as in our case of retinal-uvula melanoma [4,5]. Distant melanoma spread through the bloodstream usually involves the lungs, gastrointestinal tract, brain, parotids, heart, and bones to a lesser extent.

Single (solitary) bone metastasis of malignant retinal melanoma is extremely rare and is usually associated with involvement of other organs [6]. Bone metastases from malignant melanoma are less common, ranging from 11% to 17%. The most common forms of metastatic melanoma of the spine are vertebral metastatic melanoma and intramedullary metastatic melanoma. One study reported 133 cases of vertebral metastatic melanoma over 11 years [7] and there have been nine reported cases of intramedullary spinal cord metastatic melanoma [8].

Location	Percentage of lesions (%)
Spine	54
Pelvis	21
Ribs	11
Femur and tibia	7
Humeral, ulna and clavicle	4
Temporal, maxilla and mandible	3

Table 1: Skeletal distribution of the lesions [10].

Imaging Features	Percentage of lesions (%)
Osteolytic	92.5
Cortical Erosion and Destruction	36.6
Soft tissue involvement	10.5
Mixed Osteolytic-Osteoblastic pattern (Figure 1)	8.2

Table 2: Uploaded by [9].

Case Report

A man in his fourth decade presented with a complaint of pain at the level of the thoracic ring of the Th11 thoracic vertebrae two weeks prior to a scheduled skeletal scintigraphy. He had previously been treated for retinal melanoma three years ago, which resulted in the enucleating of his right eye at another medical center. The histopathological examination after the enucleation revealed a malignant melanoma of the retina with a diameter of 2x1 cm. After the patient presented to our hospital three years after the initial diagnosis, various radiological examinations such as computed tomography (CT), magnetic resonance imaging (MRI), whole-body bone scan with 99mTc-MDP, and a CT-directed biopsy were performed. These tests, along with imaging results shown in Figures 1, 2, and 3, confirmed the diagnosis of metastatic malignant melanoma.

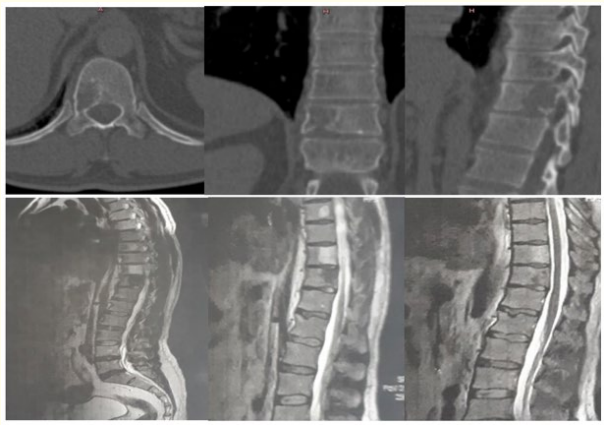

Figure 1: CT-scan and Sagittal MRI shows lytic change (bone destruction) on the right lateral pedicles arches of Th- 11.

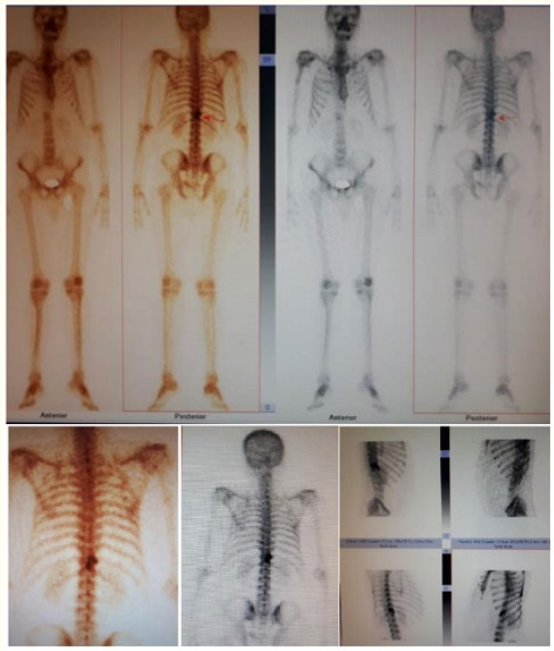

Figure 2: The bone scan showed a more intense accumulation of the tracer on the affected side of the vertebra, as well as an osteolytic defect in the right lateral part, indicative of an unusual mixed osteolytic-osteoblastic metastatic pattern located at the Th-11 thoracic vertebra. Additionally, static spots were observed in the anterior, posterior, lateral, and oblique projections, further confirming the presence of metastatic malignant melanoma in the affected vertebra.

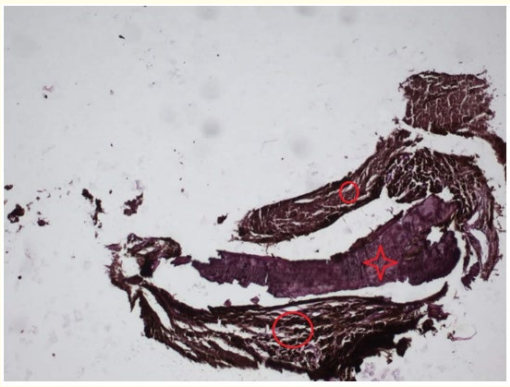

Figure 3: Histopathological outcome of Metastatic Malignant Melanoma (circle corresponds to tumor tissue, star corresponds to calcified bone trabeculae).

Discussion

Bone metastases from uveal malignant melanoma are often found in the axial skeleton and are typically osteolytic. The main goals of treatment for metastatic bone damage are pain relief, prevention or treatment of pathological fractures and decompression of the spinal cord if necessary [10,11]. Skeletal metastases are usually associated with advanced stages of the disease and may occur simultaneously with the spread of the cancer to other organs [9].

Radiography and computed tomography (CT) are often the first imaging modalities used to assess skeletal metastatic disease. However, magnetic resonance imaging (MRI) can also be helpful in the diagnosis of spinal tumors, including spinal melanoma, by showing increased signal intensity in the vertebral body with soft tissue extension into the extradural space [7,12].

Bone scan is the standard method for assessment of skeletal metastatic disease, but FDG PET/CT has been shown to be as accurate as bone scan in identifying skeletal metastatic disease, and it offers the added advantage of being able to perform cancer staging of different organ systems in the same examination [13].

While there is no standard treatment for bone metastases from uveal melanoma, radical bone resection followed by radiotherapy with or without chemotherapy is currently the most effective treatment for selected patients with solitary bone metastasis. Additionally, while checkpoint inhibitors have shown limited efficacy in treating uveal melanoma, there is currently no role for BRAF inhibitors in this type of cancer due to the absence of BRAF mutations. MEK inhibitors have also not shown a significant benefit in terms of survival as compared to other treatment options such as Dacarbazine [14].

Additionally, anti-PD1 checkpoint inhibitors have shown a low efficacy of about 9% in treating uveal melanoma [15].

It is important to maintain a high suspicion index for the possibility of metastatic disease in patients with a previous history of malignant melanoma, and they should seek early consultation if they experience any pain and swelling that does not go away. A multidisciplinary approach is necessary, especially for surgical oncology, particularly in unusual places or situations. Radiotherapy remains the treatment of choice, but radical resection may be

considered in selected patients with solitary bone metastasis to achieve long-term survival. Bone scans and plain radiographs are useful for detecting bone metastases, which are typically osteolytic or mixed osteolytic-osteoblast. Although limited studies have shown some benefit of immune checkpoint inhibitor treatment in patients with extra hepatic late-occurring metastasis, metastatic uveal melanoma is generally resistant to immune checkpoint inhibition due to its low immunogenicity and mutational burden [14-16].

For 15-month follow-up, the patient showed no signs of recurrence.

Yes, early detection and a multidisciplinary approach are key in the management of patients with bone metastases from malignant melanoma. The involvement of specialists from different fields such as radiology, pathology, medical oncology, radiation oncology, and surgical oncology can lead to a better outcome for the patient.

Additionally, close follow-up is recommended for patients who have had a previous history of malignant melanoma to monitor for any potential recurrence or development of metastases. This can include regular physical examinations, imaging studies, and blood tests to assess for tumor markers. Treatment options for metastatic disease should be individualized based on the patient's overall health status, extent of disease, and response to prior therapies. A multidisciplinary team consisting of oncologists, radiologists, and surgeons can work together to develop a comprehensive treatment plan that provides the best possible outcomes for the patient.

Conclusion

It is important to note that treatment options should always be individualized and based on a patient's specific case, including the extent and location of their bone metastasis, overall health, and other factors. Therefore, a multidisciplinary team approach with experts in oncology, surgery, and radiation therapy should be involved in developing the best treatment plan for each patient. Additionally, clinical trials investigating new treatment options should also be considered as they may offer promising results for patients with uveal melanoma and bone metastases.

Contributors List

All authors contributed equally in writing to this manuscript.

Conflicts of Interest

The authors declare that they have no known financial or interpersonal conflicts that could affect the research presented in this study.

Acknowledgement

None.

Bibliography

1. Patel JK., *et al*. "Metastatic pattern of malignant melanoma. A study of 216 autopsy cases". *The American Journal of Surgery* 135.6 (1978).

2. Reinhardt MJ., *et al*. "Diagnostic performance of whole body dual modality 18F-FDG PET/CT imaging for N- and M-staging of malignant melanoma: Experience with 250 consecutive patients". *Journal of Clinical Oncology* 24.7 (2006).

3. Nocuń A and Chrapko B. "Multiple and solitary skeletal muscle metastases on 18F-FDG PET/CT imaging". *Nuclear Medicine Communications* 36.11 (2015).

4. Shields CL., *et al*. "Metastasis of Uveal Melanoma Millimeter-by-Millimeter in 8033 Consecutive Eyes". *Archives of Ophthalmology* 127.8 (2009): 989-998.

5. Maranduca MA., *et al*. "Synthesis and physiological implications of melanic pigments (review)". *Oncology Letter* 17.5 (2019): 4183–4187.

6. Lee YTN. "Malignant Melanoma: Pattern of Metastasis". *CA Cancer Journal of Clinics* 30.3 (1980): 137–142.

7. Gokaslan ZL., *et al*. "Melanoma metastatic to the spine: A review of 133 cases". *Melanoma Research* 10 (2000).

8. Ishii T., *et al*. "Intramedullary spinal cord metastases of malignant melanoma: an autopsy case report and review of the literature". *Clinical Neuropathology* 29.5 (2010): 334-340.

9. Wedin R., *et al*. "Surgical treatment of skeletal metastases in 31 melanoma patients". *Acta Orthopaedica Belgica* 78.2 (2012).

10. Brountzos E., *et al*. "Bone metastases from malignant melanoma: a retrospective review and analysis of 28 cases". (2001).

11. Masoomian B., *et al*. "Overview of BAP1 cancer predisposition syndrome and the relationship to uveal melanoma". *Journal of Current Ophthalmology. Iranian Society of Ophthalmology* 30 (2018): 102–109.

12. O'day SJ., *et al*. "Metastatic Melanoma: Chemotherapy to Biochemotherapy". *Cancer Control* 9.1 (2002): 31-38.

13. Eck JC., *et al*. "Delayed presentation of metastatic melanoma of the cervical spine". *Orthopedics* 31.2 (2008).

14. Davies H., *et al*. "Mutations of the BRAF gene in human cancer" (2002).

15. Algazi AP., *et al*. "Clinical outcomes in metastatic uveal melanoma treated with PD-1 and PD-L1 antibodies". *Cancer* 122.21 (2016): 3344–3353.

16. Kaštelan S., *et al*. "Immunotherapy for Uveal Melanoma - Current Knowledge and Perspectives". *Current Medicinal Chemistry* 27.8 (2019).