Case Report

Primary Ewing's Sarcoma of the Sole in a 40-Year-Old Female: a Rare Case Report

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Abstract

Ewing's sarcoma is a malignant tumor characterized by small round blue cells, primarily affecting children and adolescents. Its occurrence in adults, especially at skin or extremity sites such as the sole, is extremely uncommon. We present a case of a 40-year-old woman who had a pigmented lesion on her right sole, which was initially thought to be a melanocytic lesion. After histopathological and immunohistochemical analysis, the final diagnosis was determined to be Ewing's sarcoma. This case highlights the necessity of considering Ewing's sarcoma in the differential diagnosis of atypical acral tumors, even in adult patients.

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Introduction

Ewing's sarcoma is classified as a primitive neuroectodermal tumor (PNET) that is most commonly found in children and usually develops in bones or deep soft tissue. Primary cutaneous or acral forms are uncommon, especially in adults over 30 years old. The histopathological characteristics are similar to those of other small round blue cell tumors, making the use of immunohistochemistry essential for accurate diagnosis [1]. We present a rare case of Ewing's sarcoma occurring on the sole of a 45-year-old female in Bangladesh, highlighting the diagnostic challenge and significance of appropriate immunohistochemical markers.

Case Presentation

A 45-year-old female presented to the Labaid dermatology clinic with a pigmented lesion on the right sole, noticed over several months with gradual enlargement and intermittent tenderness. There was no history of trauma, systemic symptoms, or similar lesions elsewhere.

Clinical Examination

- Location: Right sole, lateral to mid-plantar area
- Appearance: 4.5 cm pigmented, slightly raised lesion
- No regional lymphadenopathy
- Provisional clinical diagnoses included melanoma, pigmented adnexal tumor, or vascular lesion

Investigations

Biopsy: Punch biopsy revealed a dermal tumor composed of sheets of small round blue cells with scant cytoplasm, round nuclei, and inconspicuous nucleoli.

IHC Panel

- CD99: Strong membranous positivity
- NKX2.2: Nuclear positivity
- Desmin: Focal cytoplasmic positivity.
- LCA: Negative
- Synaptophysin: Negative
- BCOR: Focally positive
- FLI 1: Positive

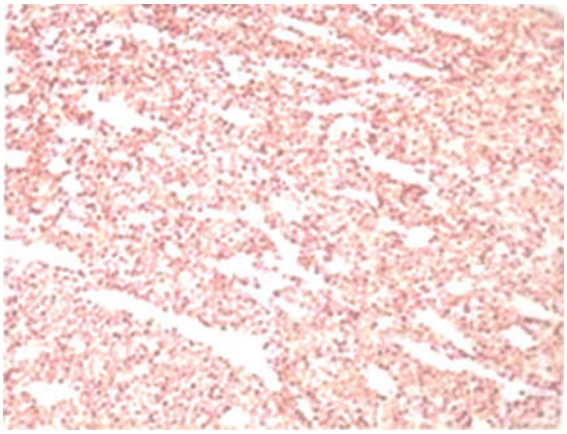


Figure 1: Tumor cells are positive for NKX 2.2.

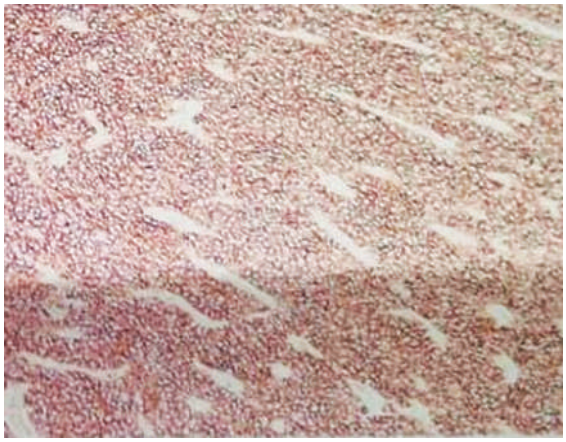


Figure 2: Tumor cells are positive for CD99.

Final Diagnosis

Ewing's sarcoma, confirmed based on histopathology and immunoprofile.

Further Workup

- MRI of the foot showed a well-circumscribed soft tissue mass with no bony involvement.
- PET-CT scan: No evidence of metastasis.

Management

The patient underwent wide local excision with negative margins. She was referred to oncology for systemic evaluation and adjuvant chemotherapy following Ewing's sarcoma protocol (VAC/IE regimen: Vincristine, Adriamycin, Cyclophosphamide alternating with Ifosfamide and Etoposide).

Follow-Up

At 6 months post-treatment, the patient remains disease-free with no local recurrence or metastasis.

Discussion

Ewing's sarcoma in adults, particularly in atypical cutaneous or acral sites, is infrequently seen, which can cause delays in diagnosis. The sole is a rare location, and the initial pigmented look can resemble benign lesions or melanoma [2]. The IHC profile plays an important role in differentiating Ewing's sarcoma from similar conditions like lymphomas (LCA+), neuroendocrine tumors (synaptophysin+), or other small round cell sarcomas (BCOR+ in clear cell sarcoma or CIC-rearranged sarcomas). The key diagnostic markers include the distinctive CD99 positivity on the membrane and the nuclear expression of NKX2.2 [3]. Although desmin positivity may raise suspicion for rhabdomyosarcoma, its focal nature here supported an Ewing's diagnosis.

Conclusion

This case exemplifies a rare adult-onset Ewing's sarcoma at an atypical acral site, emphasizing the need for histological and immunohistochemical vigilance in diagnosing small round blue cell tumors in unexpected clinical scenarios.

References

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