VOLUME - 15, ISSUE - 07, JULY - 2026 • PRINT ISSN No. 2277 - 8160 • DOI : 10.36106/gjra

Original Research Paper

Histopathology

EPITHELIOID SARCOMA OF THE HAND: A RARE ENTITY WITH REVIEW OF LITERATURE

Dr. Parveen Rana Kundu	MD Pathology, Professor, Department of Pathology B.P.S GMC (W), Sonipat
Dr. Kulwant Singh	MD Pathology, Professor, Department of Pathology B.P.S GMC (W), Sonipat
Dr. Sunaina Hooda	MD Pathology, Associate Professor, Department of Pathology B.P.S GMC (W), Sonipat
Dr. Priti Yadav	PG Resident, MD Pathology, Department of pathology B.P.S GMC (W), Sonipat
Dr. Monika B Gathwal	MD Pathology, Professor, Department of Pathology B.P.S GMC (W), Sonipat
Dr. Nitika Chawla	MD Pathology, Associate Professor, Department of Pathology B.P.S GMC (W), Sonipat

ABSTRACT Epithelioid sarcoma (ES) is a rare soft tissue malignancy commonly affecting young adults and frequently involving distal extremities. We present a case of an 18-year-old male with a progressive swelling in the left hand. Histopathological and immunohistochemical (IHC) findings supported the diagnosis of epithelioid sarcoma with loss of INI-1 expression. This case highlights the diagnostic challenges and emphasizes the importance of correlating histopathology with immunohistochemistry and clinical findings. Literature comparison further supports the aggressive nature and characteristic molecular profile of ES.

KEYWORDS : Epithelioid sarcoma, Soft tissue sarcoma, INI-1 loss, SMARCB1, Hand tumor, Immunohistochemistry, CD34, Cytokeratin, EMA, Distal-type epithelioid sarcoma

INTRODUCTION

Epithelioid sarcoma is a rare mesenchymal tumor accounting for less than 1% of soft tissue sarcomas. It typically arises in distal extremities such as hands and forearms, particularly in young adults. The tumor is characterized by loss of SMARCB1/INI1 expression, which plays a crucial role in diagnosis. ES often presents as a slow-growing nodular lesion and may be misdiagnosed as benign conditions due to its indolent course.

CASE REPORT

An 18-year-old male presented to the orthopedic outpatient department with complaints of swelling and pain over medial aspect of his left-hand following trauma. The swelling was gradually progressive. The Patient subsequently developed flexion deformity of the ring and little finger. There was prior history of cystic swelling on palmar aspect three year back for which excision has been performed. There was no associated history of fever or systemic illness. On general examination, the patient was conscious, oriented, and vitally stable with a blood pressure of 126/70 mmHg and pulse rate of approximately 62/min. No pallor, icterus, cyanosis, clubbing, or lymphadenopathy was noted. Systemic examination was within normal limits. Local examination revealed a solitary, well-defined swelling measuring approximately 4 × 2 x 1 cm over the hypothenar region of left hand, causing restricted extension of little and ring finger. Numbness was present over the palmar aspect. The swelling had well-defined margins, a smooth surface, and firm consistency. It was tender, non-compressible, non-reducible, and non-pulsatile. The overlying skin was normal with no sinus or discharge.

Routine laboratory investigations were within normal limits. Hemoglobin was 16 g/dL, total leukocyte count was 7000/cumm, and platelet count was 1.90 lakh/cumm. Renal function tests showed urea of 20 mg/dL and serum creatinine of 0.8 mg/dL. Serum calcium was 9.4mg/dl. Electrolytes were within normal limits, except for mildly decreased sodium levels. Liver function tests were unremarkable. Serological tests for HIV, HBsAg, and HCV were non-reactive.

Nerve conduction studies of the left upper limb demonstrated preserved motor nerve conduction parameters across the median, ulnar, and radial nerves. Distal latencies, amplitudes, and conduction velocities were within normal limits. The median nerve showed conduction velocity of approximately 61 m/s, the ulnar nerve approximately 60 m/s, and the radial nerve approximately 52 m/s, without evidence of conduction block or delay.

Ultrasonography revealed an ill-defined heterogeneous subcutaneous lesion measuring approximately 14 × 12 mm, without deep osseous extension or significant internal vascularity. MRI of the left hand showed an ill-defined lesion with altered signal intensity involving the flexor tendon sheath of the ring and little fingers, along with associated moderate periosteal reaction of the adjacent metacarpal.

Based on the clinical and radiological findings, a provisional differential diagnosis of diffuse giant cell tumor of tendon sheath and infective pathology was made and excised specimen sent for histopathological examination.

The specimen was received in a container labelled as excised soft tissue from the palmar aspect of left hand. It consisted of a grey-white to grey-brown soft tissue piece measuring approximately 4 × 4 × 0.5 cm, which were already cut open. All soft tissue pieces were processed.

Histopathological examination of the specimen revealed tumor cells arranged in nodules, sheets, and groups, showing a nodular growth pattern. At places, the cells were arranged in cords and in vague fascicles. The tumor cells were predominantly oval to polygonal to spindle-shaped, with moderate amounts of eosinophilic cytoplasm. Nuclear features showed pleomorphism with irregular nuclear contours. Focal areas exhibited cytoplasmic vacuolation and clearing. The tumor cells were seen surrounding necrotic zones in a garland-like configuration. Atypical mitotic figures were present. The surrounding stroma showed myxohyaline changes along with areas of granulation tissue. Overall histomorphological

features were suggestive of a malignant mesenchymal tumor of small round cell type. The differential diagnoses considered included (1) extra skeletal Ewing sarcoma/PNET family tumor, (2) epithelioid sarcoma, and (3) unclassified sarcoma. Immunohistochemical evaluation was done.

DISCUSSION

Epithelioid sarcoma (ES) is a rare malignant soft tissue neoplasm exhibiting both mesenchymal and epithelial differentiation, accounting for less than 1% of all soft tissue sarcomas. It was first described by Franz M. Enzinger in 1970.[1] ES continues to pose significant diagnostic and therapeutic challenges due to its deceptively indolent onset, high recurrence rate, and metastasic potential. It predominantly affects young adults, with the classic distal type involving the extremities, and the proximal type involving deeper axial locations and showing more aggressive behavior.[2] ES often presents as a painless mass, mimicking benign lesion such as granulomatous lesions, cysts, or nerve compression syndromes, leading to frequent misdiagnosis and delayed treatment. In cases involving peripheral nerves, symptoms may resemble carpal tunnel syndrome, cubital tunnel syndrome, or radiculopathy, further complicating early diagnosis. This highlights the importance of maintaining a high index of suspicion, particularly in atypical or non-resolving cases.[7]

Several studies in the literature have contributed to a better understanding of the clinicopathological spectrum of ES. A clinicopathological analysis by Chase L. Hornick and Christopher D. M. Fletcher highlighted that proximal-type ES is associated with a significantly worse prognosis compared to the conventional distal type, emphasizing its aggressive nature and higher metastatic potential. A multi-institutional study by Brian A. Raut et al. demonstrated that lymph node metastasis is more common in ES than in most other soft tissue sarcomas, suggesting the importance of nodal evaluation during staging. These findings are consistent with the present understanding that ES has a unique pattern of spread compared to other sarcomas[2,3]

Histologically, ES show nodular aggregates of epithelioid cells with eosinophilic cytoplasm and vesicular nuclei, often showing central necrosis that can mimic granulomatous inflammation.[2,7] The proximal variant frequently exhibits rhabdoid morphology with marked nuclear atypia and increased mitotic activity.[2] Immunohistochemically, the tumor shows co-expression of epithelial markers such as cytokeratins and epithelial membrane antigen (EMA), along with mesenchymal markers like vimentin.[7] A defining molecular feature is the loss of SMARCB1 (INI1) expression, which plays a critical role in diagnosis and reflects underlying dysregulation of chromatin remodeling pathways.[7,8]

From a radiological perspective, high-resolution ultrasound has been emphasized as an effective tool for detecting tumors involving peripheral nerves and differentiating them from compressive neuropathies. Early imaging can significantly reduce the chances of misdiagnosis and improve clinical outcomes.[7]

Despite these advancements, wide surgical excision with negative margins remains the cornerstone of treatment.[3] Adjuvant radiotherapy is often employed to reduce local recurrence, especially in high-risk or incompletely excised tumors.[8]

Conventional chemotherapy has demonstrated limited benefit, although it may still be used in advanced disease settings.[5] Prognostically, ES is associated with high rates of recurrence and metastasis, commonly involving the lungs and regional lymph nodes. Adverse prognostic factors include proximal-type histology, large tumor size, deep-seated lesions, vascular invasion, and delayed diagnosis.[2]

Recent advances in molecular oncology have led to the development of targeted therapies. Tazemetostat, an EZH2 inhibitor, has demonstrated promising activity in patients with advanced epithelioid sarcoma exhibiting loss of INI1/SMARCB1 expression, providing a novel therapeutic option for patients with unresectable or metastatic disease.[6]

Thus, a final diagnosis of epithelioid sarcoma was made based on the combined assessment of clinical, radiological, histopathological, and immunohistochemical findings. Recognition of this entity is of paramount importance, as it can closely simulate malignancy both clinically and radiologically, leading to potential misdiagnosis and overtreatment.

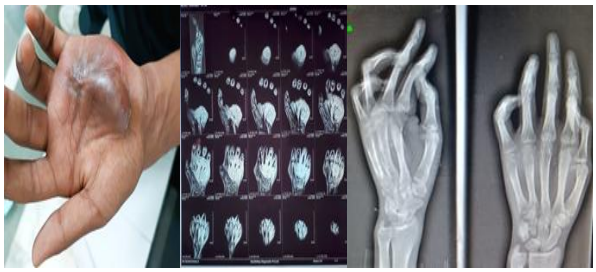

Fig1,2,3- Ill-defined, tense swelling, MRI hand shows T1 iso–hypointense, T2 hyperintense heterogeneous mass, AP and oblique radiographs of the right hand showing an aggressive soft tissue mass with osteolytic destruction of the fifth metacarpal and phalanges.

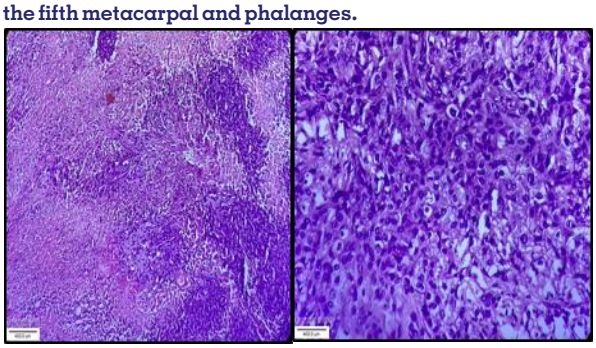

Fig 4,5, H&E stained section show epithelioid tumor cell with necrosis (40X,100X)

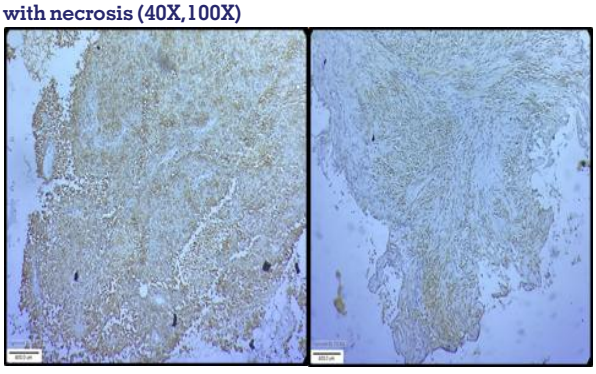

Fig 6,7 IHC reveals EMA, CD99 positivity supporting diagnosis of epithelioid sarcoma. (40X)

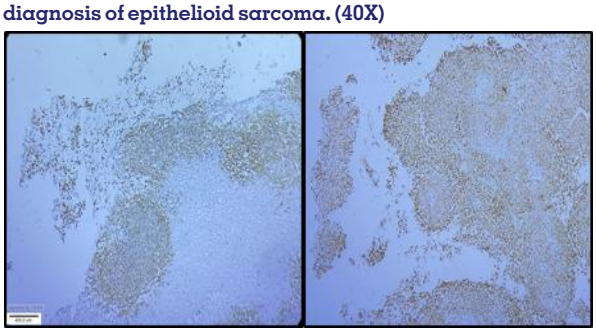

Fig 8,9 IHC show NSE and CK positivity supporting diagnosis of epithelioid sarcoma.(40 X)

Fig 10 IHC showing S100 negativity. (40X)

CONCLUSION

Epithelioid sarcoma is a rare and aggressive malignancy with distinct histopathological and molecular characteristics. Correlation with existing literature highlights its variable clinical behavior, the prognostic significance of tumor subtype, and emerging therapeutic strategies. Continued research, particularly in the domain of targeted therapy and molecular pathology, is essential to improve diagnostic accuracy and clinical outcomes in patients with this challenging neoplasm.

REFERENCES

1. Enzinger FM. Epitheloid sarcoma. A sarcoma simulating a granuloma or a carcinoma. Cancer. 1970;26(5):1029-41.
2. Hornick JL, Fletcher CDM. Clinicopathologic analysis of 106 cases of epithelioid sarcoma: prognostic assessment and a proposal for a new classification. Am J Surg Pathol. 2006;30(11):1433-42.
3. Raut CP, Hornicek FJ, Bertagnolli MM, Harmon DC, Baldini EH, Rosenberg AE, et al. Surgical management of epithelioid sarcoma: prognostic factors and outcome in a series of patients treated at a single institution. Ann Surg Oncol. 2005;12(11):921-9.
4. Rekhi B, Gorad BD, Chinoy RF. Clinicopathological features and outcomes of epithelioid sarcoma: experience from a tertiary cancer center. Indian J Pathol Microbiol. 2013;56(3):205-10.
5. Frezza AM, Jones RL, Lo Vullo S, Asano N, Lucibello F, Ben-Ami E, et al. Anthracycline, gemcitabine, and pazopanib in epithelioid sarcoma: a multi-institutional case series. JAMA Oncol. 2018;4(9).
6. Gounder MM, Schöffski P, Jones RL, Agulnik M, Cote GM, Villalobos VM, et al. Tazemetostat in advanced epithelioid sarcoma with loss of INI1/SMARCB1: an international, open-label, phase 2 basket study. Lancet Oncol. 2020;21(11):1423-32.
7. Thway K, Fisher C. Epithelioid sarcoma: diagnostic features and genetics. Adv Anat Pathol. 2014;21(1):41-9.
8. WHO Classification of Tumours Editorial Board. Soft Tissue and Bone Tumours. 5th ed. Lyon: International Agency for Research on Cancer; 2020.