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Case Report

Extra Skeletal Myxoid Chondrosarcoma of the Left Popliteal Fossa: A Case Report

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Abstract

Extraskeletal Myxoid Chondrosarcoma (EMC) is a rare soft tissue sarcoma of uncertain differentiation characterized by abundant myxoid matrix located in the soft tissues. It affects mainly the soft tissues of the proximal end of long bones. EMC has a male preference, and this occurs in soft tissue area in patients who are more than 40 years old. The present case was 63 year old female with diagnostic findings on histopathological examination with immuno–histochemical confirmation. EMC is a rare tumor should be considered in the differential diagnosis of myxoid soft tissue neoplasm. Therefore, a multi-modal approach, having distinct clinical, cytological, histo-pathological, immunohistochemical features and cytogenetics analysis, must be necessary in establishing a more definitive diagnosis, which may finally lead to a more targeted and specific treatment for patients.

Keywords: Extraskeletal myxoid chondrosarcoma.

INTRODUCTION

Extraskeletal Myxoid Chondrosarcoma (EMC) is an extremely rare soft tissue sarcoma. It was first described in literature by Stout and Verner in year 1953[1], and later in year 1972 Enzinger and Shiraki [2] coined EMC as a different clinico-pathological entity in their study on 34 cases. EMC is extremely rare low grade malignant mesenchymal neoplasm of vague differentiation with main characteristic of presence of abundant myxoid matrix located in the soft tissues. But no previous study till date suggests any cartilaginous differentiation of EMC, although few previous studies in literature recognized that EMC could have pleuripotent behaviour. The soft tissues of the proximal end of long bones are the commonest site of involvement by EMC [3]. EMC do not fit into the subtypes of chondrosarcoma and is a distinct disease from extraskeletal mesenchymal chondrosarcoma. EMC has strong tendency for local recurrence with percentage of 37 to 48% while literature suggests its metastatic potential around 50% with most common site of involvement is pulmonary metastasis [4]. As per the sex and age of patients, the EMC has more male preponderance as compared to females with age of presentation is around 40 years [5]. As per the concern of treatment modality, previous studies highly concern on disease control by surgical resection followed by radiotherapy, with some previous reported cases in literature shows improvement of metastatic disease by the use of from tyrosine kinase inhibitor [6]. As per the concern of present case with similar diagnostic findings on histopathological examination and their confirmation on immuno–histochemical examination.

CASE HISTORY

A 63 year old female patient presented with small swelling in posterior part of left knee joint. On local examination 8x4cm lump was identified having increased local temperature, erythema with dilated veins over swelling and skin involvement was also notified. The patient's past history suggests that her mass was slowly progressive in nature over several months and it was mildly tender to the touch. On radiological investigation, MRI showed the well defined lesion 8.5x8.0x7.0 cm at the left popiliteal fossa. The lesion was causing breach in the cortex posteriorly and was extending into lower femur. Posteriorly lesion was displacing the muscles and extending upto subcutaneous tissue and skin. On post contrast images it showed heterogenous enhancement

and extension into joint involving the cruciate ligament and upper tibia. Finding suggestive of large lobulated mass lesion in the popliteal fossa showing both intra-osseous and intra-articular extension. USG whole abdomen showed normal study. X ray chest showed cardiomegaly with bronchitis.

FNAC of left knee joint was done outside and it showed mildly cellular smears with scattered atypical cells in hemorrhagic background. These cells were plasmacytoid with high N:C ratio. Some cells showed intracytoplasmic vacuolation. Final impression on FNAC smears was given as features suggestive of positive for malignant cells.

The trucut biopsy from left popliteal fossa region revealed a malignant tumor appears to had lobulated appearance. Tumor cells were loosely cohesive with moderate to abundant amount of thick eosinophilic cytoplasm and markedly pleiomorphic, hyperchromatic nuclei. Many of these tumor cells had rhabdoid appearance and final diagnosis of trucut biopsy was given as features suggestive of rhabdomyosarcoma. Immunohistochemical (IHC) staining of trucut biopsy showed expression for vimentin only. The CD99, Desmin, SMA, S-100, EMA, CK –PAN, Bcl-2 were negative. Ki67 score was 10-12%. On IHC report impression was malignant mesenchymal tumor with features suggestive of Pleomorphic cell sarcoma.

The patient later underwent above knee amputation. The tumor was identified in the left popliteal fossa which measured 6.0x3.5x3.5 cm in dimension. Cut surface of tumor was nodular and comprising of gelatinous material along with few cystic spaces. The underlying bone seem to be involved by tumor grossly. Histologic examination revealed a malignant tumor forming lobules. Stroma is chondromyxoid in most of the areas. Tumor cells are loosely cohesive, present singly or in small groups and mostly present at the periphery of the lobule. Tumor cells have moderate to abundant eosinophilic cytoplasm. Nuclei are markedly pleomorphic and hyperchromatic. Few mitotic figures are seen. Tumor is infiltrating sub-cutaneous adipose tissue and underlying bone. Large areas of necrosis are seen. Overlying skin is remarkable. Immunohistochemical staining demonstrated a positive immunohistochemical reaction for vimentin, NSE, S-100 and EMA. The Desmin, Myogenin, Smooth Muscle Actin (SMA), Cytokeratin-PAN and Synaptophysin immunostains were all negative. Based upon histological examination and IHC, the final diagnosis of EMC was given.

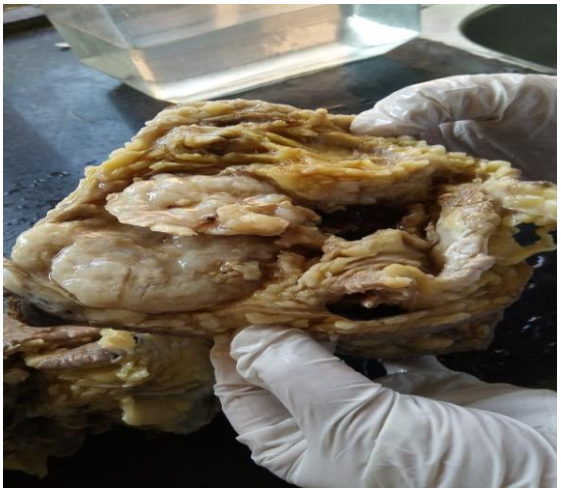

Fig-1: Gross appearance of tumor showing nodular and lobulated growth pattern

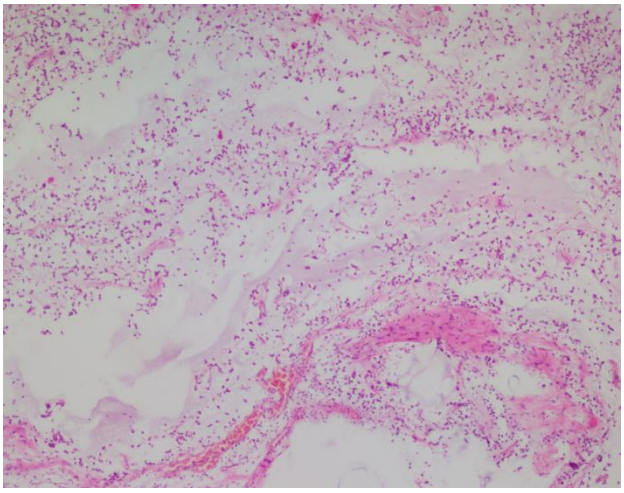

Fig-2: H&E stain of EMC shows tumor forming lobules (10x)

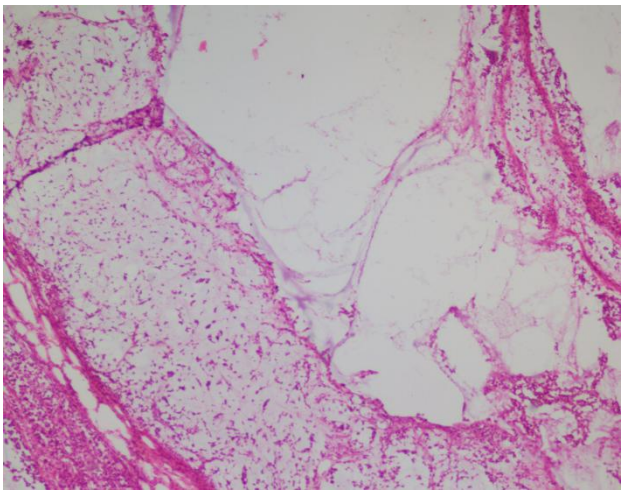

Fig-3: H&E stain of EMC showing chondromyxoid stroma with lobulated arrangement of tumor (10x)

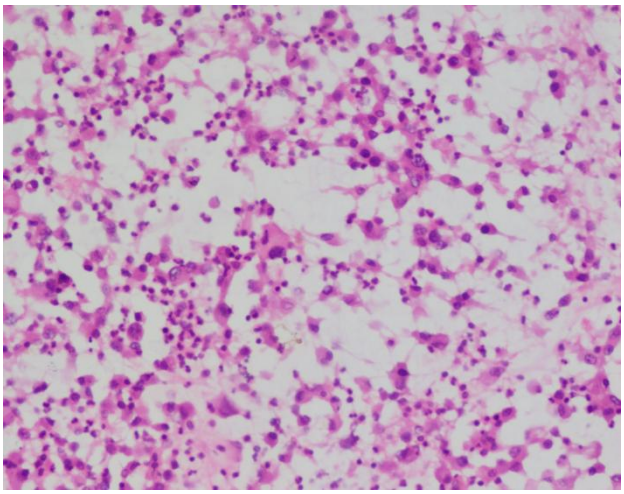

Fig-4: H&E stain of EMC showing markedly pleiomorphic nuclei (20x)

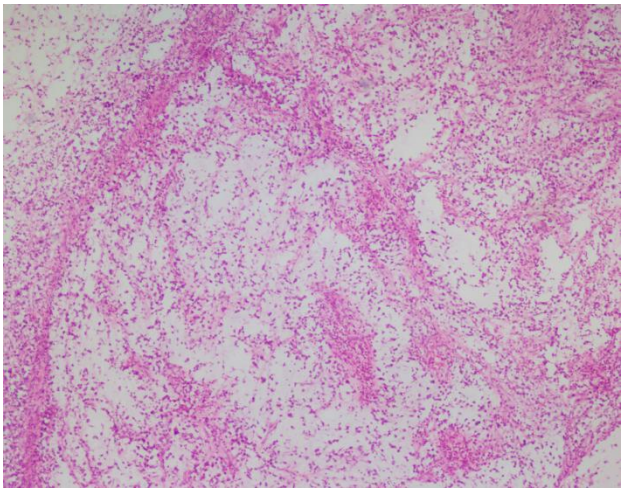

Fig-5: H&E stain of EMC shows loosely cohesive cells (10x)

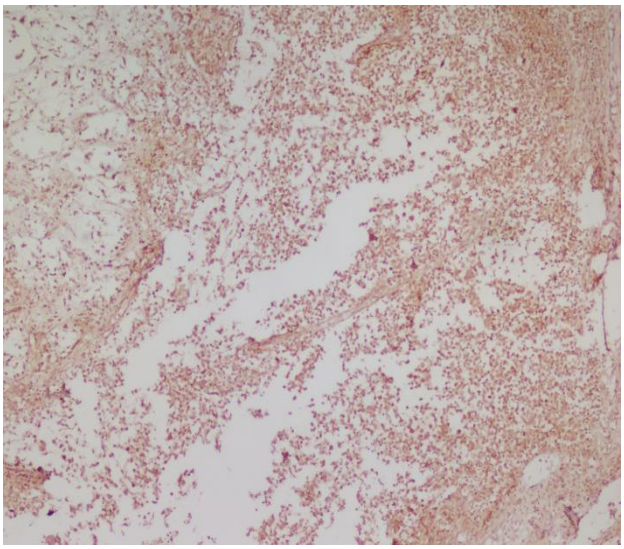

Fig-6: Positive immunoexpression of EMA (10x)

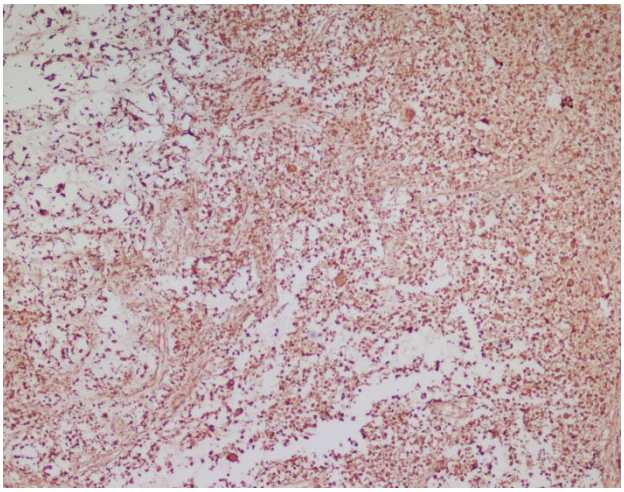

Fig-7: Positive immunoexpression of NSE (10x)

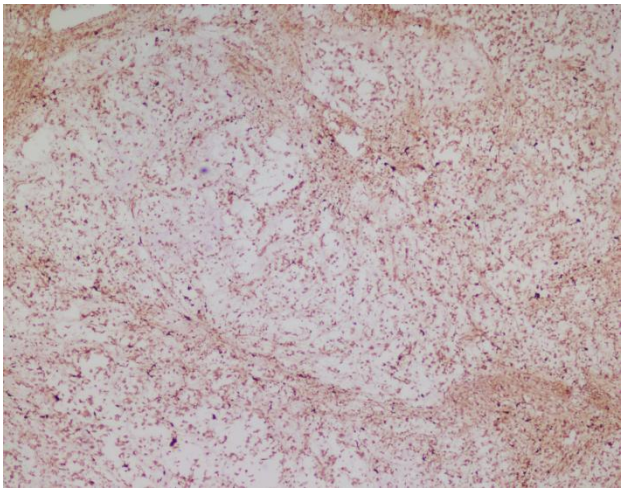

Fig-8: Positive immunoexpression of S- 100 (10x)

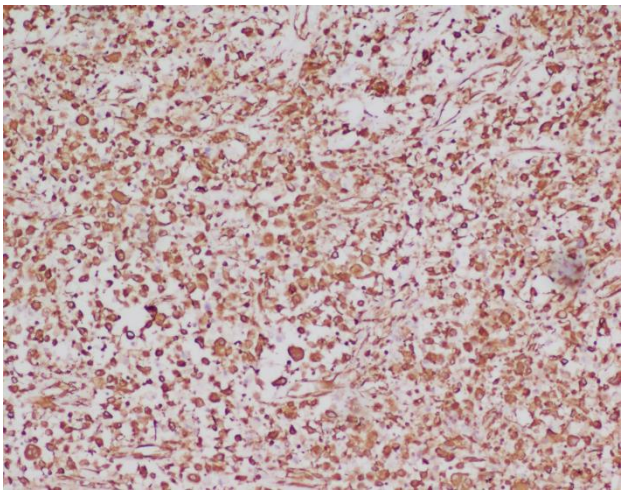

Fig-9: Positive immunoexpression of Vimentin (20x)

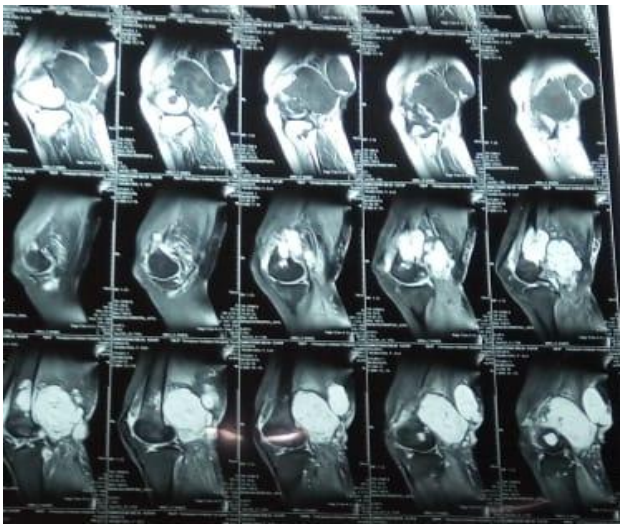

Fig-10: MRI of popliteal fossa suggestive of lobulated mass lesion

DISCUSSION

Extraskeletal myxoid chondrosarcoma was first described in literature by Stout and Verner in year 1953 [1], and later in 1972 Enzinger and Shiraki [2] coined EMC as a distinct clinico-pathological entity of soft tissue sarcoma. The literature suggests that it is an exceptional entity representing less than 3% of all soft tissue sarcomas [7]. On the basis of site of involvement of EMC, the lower extremities are the most common location followed by trunk. On the basis of sex involvement, the males are more commonly affected

than females with ratio of 2:1 and most common age of initial presentation is in the fifth and sixth decades of life [8]. In most of the cases, the clinical symptoms are usually non-specific, including slowly progressive palpable mass and presence of tenderness on touch [9]. Radiological examination are usually non specific with low density lesion on CT scan. On MRI, lesion usually exhibit both high signal intensity and low signal intensity on on T2 and T1 weighted MRI scans respectively [10]. The size of growth varies from 100 mm to 250 mm approximately. On gross examination, the tumor usually exhibit a multinodular configuration with well-defined margin and usually an incomplete fibrous capsule. Cut surface shows gray to brown discoloration with areas of gelatinous appearance, which is often accompanied by presence of intralesional hemorrhage [11]. Diagnostic cytomorphological features for EMC had been described in the few previous case reports and case series [12-17]. The most common microscopic features of EMC include myxoid ground substance usually present in background with entrenched tumor cells along with arrangement of tumor cells in the form of anastamosing cords or clusters of uniform round to spindle shaped cells with bland nuclear chromatin and inconspicuous nucleoli, and few tumor cells have cleaved or grooved nuclei suggesting chondroblast like derivation; all of which were identified in our case. However, the tumor usually does not exhibit cartilaginous differentiation. The mitotic activity is also rare in most previous reported cases. Other cell types have also been reported in previous literature including epithelioid cells with vesicular nuclear chromatin and prominent nucleoli, also rhabdoid cells with abundant clear cytoplasm and presence of hyaline cytoplasmic globules; as found in our case in trucut biopsy and surgical specimen, or anaplastic cells i,e, range of anaplasia is from small blue looking cells to spindle cell morphology to pleomorphic cells. However, other differential diagnosis of myxoid soft tissue tumor should also be considered include myxoid liposarcoma, myxofibrosarcoma, malignant fibrous histiocytoma (MFH), myxoid peripheral nerve sheath tumor (MPNST), myxoma and chordoma [11]. However, EMC has no specific immunohistochemical staining but vimentin is generally expressed in all the cases with focal positivity of S-100 protein and epithelial membrane antigen (EMA), as in our current case. Few previously reported cases of EMC showing variable immunohistochemical reaction for synaptophysin, chromogranin, and NSE, suggesting neuroendocrine differentiation of EMC [18]. In electron microscopy, the characteristic, but not specific, feature of EMCare the presence of parallel microtubules and abundant REG [19]. Few previous studies had shown that EMC may have positive immunohistochemical reaction for Leu-7 and EMA but all the previous studies shown that EMC are usually negative for keratin, SMA and desmin [20].

As concern to molecular technique, Cytogenetical analysis of EMC showed that it is associated with recurrent chromosomal translocation t (9; 22) (q22; q12) in about 80% of cases, usually examined by reverse transcriptase polymerase chain reaction technique on paraffin fixed tissue. Other cytogenetical translocations which may be reported in previous studies are t (9; 15) (q22; q12), t (9; 17) (q22; q11.2), t (9; 17; 15) (q22; q11; q22), t (2; 13) (q32; p12) and t (11; 22) (q11; p11) [21]. So, ancillary technique such as immunohistochemical staining, cytogenitical analysis and electron microscopy are also valuable tool for diagnosis of EMC [11]. The choice of treatment is total surgical resection of the initial tumor and / or metastasis lesion. It has been reported in few previous studies that EMC usually does not respond to chemotherapeutic drugs and results regarding response of radiotherapy treatment are variably discordant [22]. So role of radiotherapy and chemotherapy as first line treatment is questionable. As per the concern of metastatic EMC, the most common site is the lung metastasis followed by soft tissue, lymph nodes, bone, and brain. The poor prognostic factors of EMC are its occurrence in male patients, with the late onset of initial presentation, more than 10 cm of tumor size, proximal involvement of long bones, with the incomplete surgical resection and presence of metastatic disease during initial work up for definitive diagnosis [23]. The histomorphological criteria such as the presence of necrosis, frequent mitotic figures and the variable degree of differentiation usually does not affect the prognosis of disease [24].

CONCLUSION

EMC is extremely uncommon intentity which should be considered as differential diagnosis when there is abundant myxoid change in soft tissue tumors. Therefore, a multi disciplinary approaches are essential for establishing more definitive diagnosis, such as clinical ,cytological, histo-pathological, immuno-histochemical features and finally by molecular analysis, so that specific treatment is given in terms of more targeted therapy for disease improvement and final outcome.

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