EXTRA SKELETAL MESENCHYMAL CHONDROSARCOMA: A CASE REPORT

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Abstract:
Chondrosarcoma is a common primary bone neoplasm. It includes a heterogeneous group of tumors characterized by the production of a cartilage matrix. Chondrosarcoma has a classic intra osseous origin, however extra skeletal origin is not uncommon. The Mesenchymal variant accounts for only 2% of all chondrosarcomas and is a high grade, aggressive tumor with bimorphic histological features. Mesenchymal chondrosarcoma is chiefly an osseous tumor and extra osseous origin in rare. This tumor type contrasts from conventional chondrosarcoma in its unique chemotherapy and radiotherapy sensitivity. We report a case of extra skeletal mesenchymal chondrosarcoma and review current literature on this unique variant.

Introduction:
Chondrosarcoma is the third common bone primary bone malignancy and includes a heterogeneous group of neoplasms characterized by the production of a cartilage matrix. Chondrosarcoma has a classic intra medullary origin, however extra skeletal origin is not uncommon. The Mesenchymal chondrosarcoma accounts for only 2% of all chondrosarcomas and is a high grade, aggressive tumor with bimorphic histological features. Mesenchymal chondrosarcoma is chiefly an osseous tumor and extra osseous origin in rare, other unique attributes include reported chemotherapy and radiotherapy sensitivity that contrasts with conventional chondrosarcoma. We report a case of extra skeletal mesenchymal chondrosarcoma and review current literature on this unique variant.
Case Report:

A 60 Year old lady presented to our department with a painless, progressive swelling of left anterior mid thigh which she had noticed after a trivial trauma. On examination a 8X6 cms firm, mobile, vertically hemiellipsoid swelling arising from the anterior compartment muscles of the thigh was observed (Fig:1). There was no regional lymphadenopathy or no distal neurovascular deficit. A soft tissue tumor work up with local imaging followed by core biopsy was done. MRI revealed a, lobulated T2 hyper intense tumor with low signals on T1 sequences and contrast enhancement. The femur and neurovascular bundle were uninvolved on MRI images(fig:2). The core biopsy was suggestive of a spindle cell sarcoma. A wide excision with adequate margins was done and post operative histopathological examination confirmed mesenchymal chordrosarcoma (fig:3). The patient received adjuvant radiotherapy and chemotherapy and is disease free after 1yr of follow up.

Discussion:

Mesenchymal chordrosarcoma was first described by Lichtenstein and Bernstein in 1959 (1). It is a highly aggressive variant with a strong tendency for distant metastasis. It affects both men and women equally, predominantly between 10-30 years. Mesenchymal chordrosarcoma is a primary bone neoplasm, it is rarely extra skeletal and involves meninges, orbit and lower extremities (1).

The exact etiology is unknown. Reported cytogenetic abnormalities include der(13;21), overexpression of TP53, anti apoptotic BCL2, protein kinase C-alpha, and platelet derived growth factor receptor. The above markers are non specific and have no prognostic or predictive value as yet (2). Mesenchymal chordrosarcoma presents with localized pain and swelling at skeletal sites such as skull, ribs, spine, pelvis and lower appendicular skeleton. The extra skeletal lesion invariably present as a painless, progressive soft tissue tumor (3,4). Imaging with X rays or CT scans show characteristic ring and arc type of soft tissue calcification in most extra skeletal tumors and help differentiate a soft tissue sarcoma. MR imaging is generally non specific with lobulated T2 hyper intense and T1 hypo or iso intense features (3,4). Angiography done in some centers has been replaced by less invasive CT/MR angiogram and in present practice is required only in select situations.

The tumors are grossly well circumscribed, fleshy, grey white with random areas of mineralization or cartilage rests. Microscopically a bimorphic tumor population consisting of nests and sheets of un differentiated small round cells alternating with areas of well differentiated cartilage are seen. The two patterns may be distinct or blend imperceptibly. Extensive areas of necrosis are rare (5). Immuno histochemistry studies are positive for CD 99, neuron specific enolase, and desmin but negative for epithelial membrane antigen, smooth muscle actin and keratins on the small cell population. The cartilage component expresses S100 positivity (5).
The small cells do not display t(11,22)/t(21,22) and hence are considered distinct from Ewings sarcoma. IHC studies are generally not required for diagnosis and may be considered if small cell osteosarcoma is suspected histologically, alternatively RT-PCR for detecting or confirming the absence of t(11,22) may be utilized to reliably exclude Ewings sarcoma (5,6).

Primary surgery is the recommended treatment modality. Conventional chondrosarcoma is traditionally considered chemotherapy and radiotherapy resistant, but the round cell histology has prompted the use of chemotherapy in mesenchymal chondrosarcoma with variable success. Cesari et al reported a 60% absolute disease free survival benefit at 10 yrs (76% vs 17%) for chemotherapy. This study also demonstrated complete surgical resection and localized disease as significant prognostic variables (8). However, small sample size, retrospective nature and single institution experiences are prone for bias. A systematic review by Xu et al revealed surgery with negative margins was associated with lower local recurrences and higher event free survival. Anthracycline based chemotherapy and adjuvant radiotherapy was not associated with improved survival outcomes in this study (9). The evidence for beneficial effect of radiation is sparse and has similar controversies as chemotherapy (10).

Radiation therapy is recommended for positive margins or for salvage. In summary surgery with negative margins is unequivocally associated with improved survival but the data regarding adjuvant chemotherapy is conflicting. It is difficult to base robust clinical decisions on adjuvant therapy based on available evidence.

Our case highlights the diagnostic difficulties encountered when mesenchymal chondrosarcoma presents extra skeletal particularly with out the characteristic ring and arc type of matrix calcifications. The smaller samples of a core biopsy specimen are prone to sampling errors and may not reveal the bimorphic histology leading to pre operative misdiagnosis as a soft tissue spindle cell sarcoma. The final post operative histopathological examination is generally confirmatory.

CONCLUSION

Extra skeletal mesenchymal chondrosarcoma is a rare aggressive variant with characteristic bimorphic histology. It is commonly misdiagnosed as a soft tissue spindle cell tumor and exhibits unique radiotherapy and chemotherapy sensitivity. Surgery is the only modality proven to improve survival and the role of adjuvant therapy continues to evolve.
Fig 1 showing tumor on presentation

Fig 2 showing MRI appearance—heterogeneous with contrast enhancement

Fig 3 Bimorphic tumor with cartilage (arrow) and small round cells (star)

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