Case Report

Cytodiagnosis of Chondrosarcoma: A case report

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Abstract

Primary tumors involving the bony skeleton of the chest wall are uncommon. Chondrosarcomas of thorax are unusual tumors categorized as axial malignancies that invade and destroy the adjacent bone. Fine needle aspiration cytology (FNAC) is effective in the diagnosis of bone tumors when combined with careful radiologic and clinical evaluation. Chondrosarcomas often arise in the pelvis or bones of the trunk, but primary chest wall (rib) chondrosarcomas are relatively rare. Incidence of chondrosarcoma peaks in the 5th to 6th decade. We present a two cases one of 58-year-old male with anterior chest wall mass and another of 70-year-old male presented with anterolateral chest wall mass. Fine needle aspiration was done and smear studied showed increased cellularity with chondromyxoid background and tissue fragment with chondrocytes showing anisonucleosis and nuclear pleomorphism. Few binucleate cells were seen and few nuclei showed prominent nucleoli. The diagnosis of chondrosarcoma was considered.

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Introduction

Chondrosarcoma is a cartilage forming bone tumor. It involves most commonly the femur, humerus, pelvis, scapula but rarely involves rib. Eighty percent of anterior chest wall tumor originate from the cartilaginous and bony structures of ribs and 20% originate from the sternum and 2-4% of chest wall chondrosarcomas rarely present as an anterior mediastinal mass. Most of these tumors arise from the costochondral or the

chondrosternal junction.[1] This tumor occurs more often during the third and fourth decade of life; males are more commonly affected. Chest wall tumors grow slowly. Median survival for these tumours is 2.5% and overall survival is 46%. Result of resection of these tumors yields better outcomes.[2]

Case Report

Case 1: We present a case of 58-year-old male who presented with a solitary, painless mass over anterior chest wall measuring 5cm in greatest dimension since 6years. Initially smaller in size and gradually increased to present size and overlying skin is smooth and unremarkable. The mass is firm, non- tender and immobile. Ultrasound showed a well defined lobulated hypoechoeic solid lesion and multiple calcific foci arising from the right lower rib and in the right hypochondrium at the sight of swelling most likely suggestive of osteochondroma. FNAC smears (Fig.1) showed tissue fragments with variable cell contents and chondromyxoid background. The tumor cells have well defined cytoplasm and nuclei with one or two nucleoli. Few binucleate cells are also seen. The diagnosis of chondrosarcoma was considered. The cytological findings were confirmed by histopathological report and the final diagnosis of low grade chondrosarcoma was considered. The histopathology report was retrieved on follow up.

Case 2: We present a case of 70-year-old male who presented with a solitary, painless mass over antero-lateral chest wall measuring 15cm in greatest dimension since 15years. Initially smaller in size and gradually increased to present size and overlying skin is smooth and unremarkable. The mass is firm, non- tender and immobile. Ultrasound showed a well defined mass measuring 11 cm in greatest dimension with mixed echogenecity and predominantly hyperechoeic in left anterolateral chest wall, minimal vascularity, few areas of necrosis, multiple tiny calcifications seen suggestive of neoplastic etiology mostly of cartilaginous origin. FNAC smears (Fig.2) studied shows tissue fragments with variable cell contents and chondromyxoid background. The tumor cells have well defined cytoplasm and nuclei with one or two nucleoli. Few binucleate cells are also seen. The diagnosis of chondrosarcoma likely to be low grade was considered. On gross we received tumor biopsy which aggregated to measure 2X1 cm, grey white in color and congested appearance. On microscopy, hemotoxylin and eosin (H &E) stained smears (Fig.3) showed abundant chondroid matrix with plenty of tissue fragments . The tumor cells have a well defined cytoplasm with round oval nuclei and moderate degree of pleomorphisim seen and few binucleate cells were seen. The diagnosis of low grade chondrosarcoma was considered.

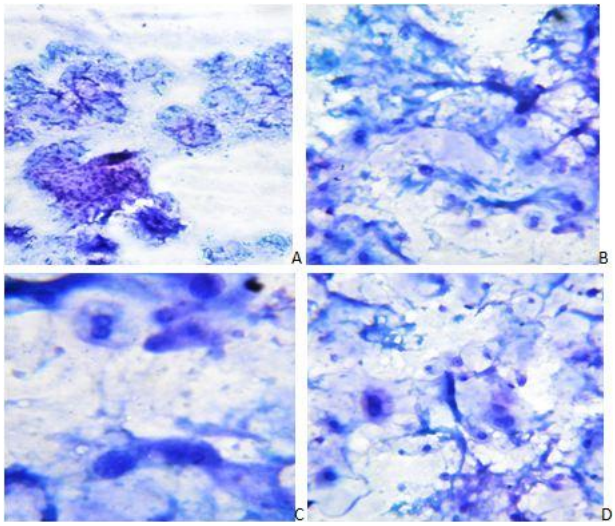

Figure1: Cytological examination revealed abundant chondroid matrix with plenty of tissue fragments. The tumor cells have a well defined cytoplasm with round oval nuclei and moderate degree of pleomorphisim seen and few binucleate cells are seen

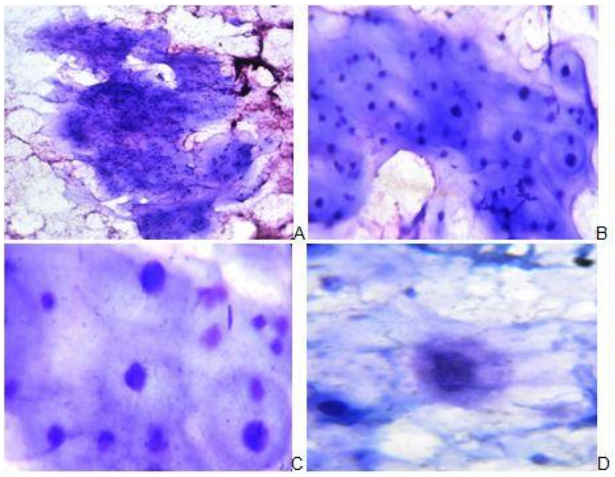

Figure 2: FNAC smears (100X AND 400X) showed tissue fragments with pleomorphic cells in small clusters and single cells with a prominent chondroid stroma.

Discussion

Chondrosarcoma, a malignant cartilage forming bone tumor, divided into two major categories on the basis of microscopic criteria: conventional chondrosarcoma and chondrosarcoma variant and comprising about 10-15% of bone tumors. The majority of the patients with con-

ventional chondrosarcoma are between 3rd to 6th decades of life.[1] Chondrosarcomas are divided according to location into central, peripheral, and juxtacortical (periosteal) forms. Central chondrosarcomas are located in the medullary cavity, usually of a flat or long bone. Chondrosarcomas are classified as dedifferentiated, mesenchymal, myxoid and clear cell overt cellular tumors.[2]

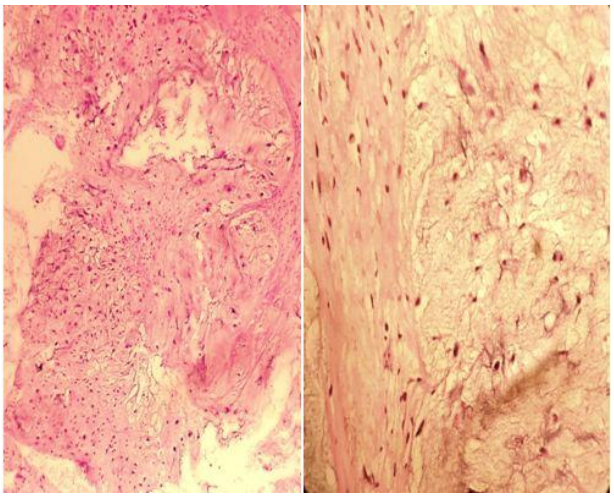

Figure 3: Microscopic appearance of well-differentiated chondrosarcoma. The tumor retains a lobulated appearance, but nuclear atypicality is obvious.

Pleomorphism is generally not a feature of chondrosarcoma except in dedifferentiated tumors.[3] Radiographically, they present a rather characteristic picture of an osteolytic lesion with splotchy calcification. Ill-defined margins, fusiform thickening of the shaft, and perforation of the cortex are three important diagnostic signs.[4] The chondromyxoid ground substance is usually as abundant in low-grade tumors as in chondrosarcoma . The neoplastic cells are best studied in wet-fixed preparations. Cellularity is variable in low-grade chondrosarcoma. This is important in the distinction from chordoma. A rich yield with plenty of tissue fragments demonstrating the variable cell content makes the diagnosis easier.[5] The tumor cells have a well-defined cytoplasm and rounded nuclei with one or two nucleoli. Binucleate cells are present and nuclear pleomorphism is of moderate degree. Single cells dominate in high-grade malignant tumors, cellular and nuclear pleomorphism is prominent and mitoses are present. Often abundant myxoid background matrix is present, while fragments of hyaline cartilage are few. As stated above, it is difficult or impossible to distinguish between chondroma and some low-grade that is grade1 chondrosarcomas in FNB smears. Grade 3 chondrosarcomas may be difficult to distinguish from chondroblastic osteosarcoma and from metastatic poorly differentiated epithelial tumors if cartilaginous fragments are absent. Chordoma should be considered in the differential diagnosis in spinal or sacral tumors. Dedifferentiated chondrosarcoma is yet another pitfall. This distinct variant has two components: a low-grade chondrosarcoma or chondroma and a high-grade sarcoma which is not a grade 3 chondrosarcoma.[6] The clue to the cytological diagnosis is the presence of a low-grade cartilaginous tumor and a high-grade sarcoma most often pleomorphic sarcoma of MFH type or rarely osteosarcoma or rhabdomyosarcoma in the same sample . Inadequate sampling may result in misinterpretation.[7] The most important differential diagnoses are other small cell malignant tumors such as small cell osteosarcoma and conventional Ewing's sarcoma. The dedifferentiated is a variant of chondrosarcoma. The term dedifferentiated refers to the presence of poorly differentiated sarcomatous component at the periphery of an otherwise central typical low-grade chondrosarcoma.[8] The dedifferentiated chondrosarcoma is usually of the central type, but it can also be peripheral.[9] A differentiated tumor can be found in the initial lesion but more often it is seen in specimens from recurrent tumor. The microscopic appearance of this component may be that of rhabdomyosarcoma, fibrosarcoma, osteosarcoma or pleomorphic sarcoma with Malignant Fibrous Histiocytoma (MFH).[10] Management of primary chondrosarcomas of rib /anterolateral chest wall which are rare, requires a strong clinical suspicion, clinico-radiological correlation and histopathological confirmation. Surgical management is the mainstay and consists of wide resection with tumor-free margins in order to provide the best chance for cure in both low and high grade tumors.[11]

Conclusion

Chondrosarcoma of anterior chest wall diagnosed on FNAC are relatively rare. Pathologists play an important role in reaching to accurate morphological diagnosis. Chondrosarcom should be considered in the differential diagnosis of anterior chest wall tumors. Wide excision with safe surgical margins and regular follow-up are crucial for the management of chondrosarcomas.

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Competing Interests

None declared.

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