

Pulmonary metastasis of Giant Cell Tumor of bone diagnosed by CT guided Fine Needle Aspiration with Histomorphological correlation

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ABSTRACT

Giant cell tumor(GCT) comprises around 4-5 % of all primary bone tumors and has a peak incidence between 20 and 45 years of age. Despite being classified as benign, giant cell tumor is capable of locally aggressive behaviour and occasionally of distant metastasis. Pulmonary metastasis are seen in 2 % of patients with GCTs, on average 3-4 years after primary diagnosis. These may be solitary or multiple. Pulmonary metastases of the GCT may be affected by tumor grading and localization as well as age, gender and overall health status of the patient. Patients with local recurrences of GCT of bones are more likely to develop pulmonary metastases. High expression of some genes, cytokines and chemokines may also be closely related to the metastatic potential and prognosis of GCT of bones. Some of the pulmonary metastases of GCT of bones are very slow growing, some regress spontaneously and rarely lethal. Segmental resection is considered to be the most effective treatment of pulmonary metastases while chemotherapy and/or radiotherapy may be alternate treatments in unresectable cases. An early diagnosis of the tumor can be challenging due to its rarity and done by a CT scan followed by a CT guided FNAC.

Keywords: Giant cell tumor, bone, Pulmonary metastasis, Fine-needle aspiration

INTRODUCTION

GCT is a benign, locally aggressive neoplasm which is composed of sheets of neoplastic ovoid mononuclear cells interspersed with uniformly distributed large, osteoclast like giant cells¹. The most usual sites for GCT include distal femur, proximal tibia and distal radius. This tumor is seen in young adults between 20 and 40 years of age and has a slight female predominance² with female to male ratio 1.3 to 1.5: 1.0³. Pulmonary metastasis are seen in 2 % of patients with GCTs, on average 3-4 years after primary diagnosis¹. We present a case of giant cell tumor of distal radius with recurrence as multiple lung metastasis 5 years after the treatment of primary tumor.

CASE REPORT

A 30 years female patient reported to our institution OPD with complaints of dyspnea, cough, weight loss since three months. She was operated for giant cell tumor of left distal radius five years back. The initial chest radiograph demonstrated a mass in the left superior lobe lung suspicious of malignancy. A sequential CT scan confirmed the presence of an extensive mass with dense soft tissues. Consequently a CT guided FNAC of the lung mass was done and the FNAC revealed a giant cell tumor metastasis to left lung (Figure 1). Further a thoracotomy was planned and left lobectomy was done with finding of a large lesion in the left lobe (Figure 2) which was confirmed by histopathology as benign giant cell tumor metastasis to the left lung. No further post operative treatment was considered. The follow up of the patient was uneventful.

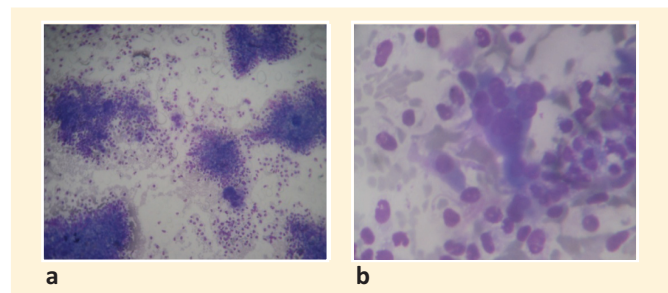


Figure 1a & b: FNAC of giant cell tumor of lung showing dual population of mononuclear round to oval cells in large clusters with adherent giant cells (H&E, 100x, 400x).



Figure 2: Cut section of lobectomy specimen showing tan gray white tumor occupying the entire lobe.

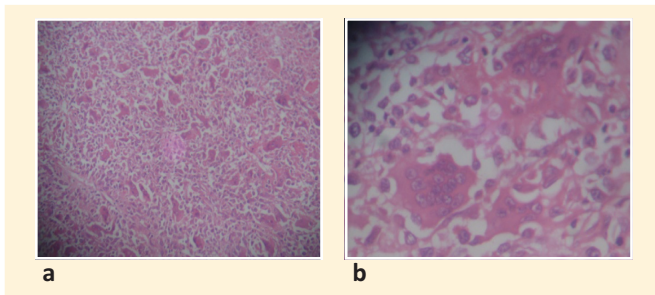


Figure 3a & b: Section showing the classic histologic features of a Giant cell tumor metastasis to lung. The multinucleated giant cells are admixed with mononuclear stromal cells (H&E, 100 x,400x).

DISCUSSION

Giant cell tumor of bone is a benign but potentially aggressive lesion with local recurrence and metastasis⁴. The histology of the tumour is characterized by three cell types: mononuclear ovoid, mononuclear spindle shaped, and osteoclast like multinucleated giant cells (Figure 3).

The course of progression of GCT of bone varies and can range from local bony destruction to local metastases. The distant metastasis and malignant transformation are extremely rare conditions⁵. Metastasis in GCT of bone most commonly in lungs, variably reported from 1 to 9 %⁶. Risk factors suggested for the development of lung metastases are local recurrence, location of the primary GCT (distal radius, proximal femur and sacrum), musculoskeletal tumor society stage 2 or 3 lesion and immunocompromised state⁷.

In benign metastasizing GCT of bones, the histology of the nodules found in the lungs are identical to that of the benign tumor of primary site. Cytological diagnoses of GCT of bones metastasizing to the lung has rarely being reported in the literature. Our findings are similar to the case described by Tepeoglu et al. with dual population of mononuclear round to oval cells in large clusters with adherent giant cells in close approximation.

The GCT of bones metastasizing to lung should be differentiated from the non-neoplastic lesions that contain giant cells such as fungal infection, mycobacterial infection, or drug and ionizing radiation induced lesions. The giant cells in this conditions have fewer nuclei and are almost always associated with granulomas⁸. The benign appearance of the mononuclear and giant cells, the lack of cellular pleomorphism, atypia, nuclear hyperchromasia, irregularity, or necrosis are helpful in differentiating GCTs from other malignant neoplastic lesions like giant cell rich osteosarcoma, giant cell variant of large cell undifferentiated carcinoma, chondrocarcoma, and malignant fibrous histiocytoma⁸.

Most of the cases of GCT metastasis to lung present as nodules. Plain radiograph of the chest and computed

tomography scans are required for the diagnosis of the metastasis of GCTs. Surgical resection alone, including the excision of nodules, wedge or segmental resection and lobectomy was the preferred method in 70 % of cases of GCT metastasis to lung performed through thoracotomy for unilateral lesions or a midline sternotomy for bilateral metastasis⁹. However, in unresectable disease radiotherapy can be used but the risk of malignant transformation exists. Little information is available about chemotherapy.

To conclude GCT metastasizing to lung is very rare. Clinical history, radiological features and cytological features are required for correct diagnosis. A CT guided fine needle aspiration cytology is recognized as a best method for establishing a diagnosis.

REFERENCES

1. Fletcher C.D.M, Unni K.K, Mertens F: Giant cell tumors. In World Health Organization Classification of Tumours. Lyon, IARC Press;2002;309-12.
2. Harnes NG, Mankin H J: Giant cell tumor of the distal forearm. J Hand Surg 2003; 29A:188 e 93.
3. Jin CM, So RK, Myung JC, Yong CL: Multiple pulmonary metastases from giant cell tumor of a hand. Am J Med Sci 2012;343: 171-173.
4. Bertoni F, Present D, Enneking WF: Giant cell tumor of bone with pulmonary metastases. J Bone Joint Surg[Am] 1985;67-A;890-900.
5. Muheremu A, Nin X: Pulmonary metastasis of giant cell tumor of bones, World journal of Surgical Oncology 2014;12:261.
6. Viswanathan S, Jambhekar NA: Metastatic giant cell tumor of bone, Clin Orthop Relat Res 2010; 468: 827-833.
7. Okzan C, Kalaci A, Ozbarlas S: Giant cell tumor of bone with pulmonary metastases; Treatment by combination of chemotherapy and whole lung radiotherapy. Case Report, Firat Tip Dergisi 2007; 12(4): 306-310.
8. Tepeoglu M, Ozdemir B.H : Pul Metastasis of benign Giant cell tumor of bone diagnosed by fine needle aspiration cytology, Erciyes Med J 2013; 35(3): 167-70.
9. Siebenrock KA, Unni KK, Rock M.G: Giant cell tumor of bone metastasizing to the lungs, A long term follow up, J Bone Joint Surg[Br] 1998; 80-B;43-47.

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