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Radiology

Unusual Location of a Giant Cell Tumor: The Sacrum

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Abstract **Case Report**

Giant cell tumor (GCT) of bone is a relatively common benign bone lesion and is usually located in long bones, but involvement of the sacrum is rare. Here, we present a case of solitary GCT of bone in the sacrum that was confirmed by preoperative needle biopsy and postoperative histological examination.

Keywords: A giant cell tumor, Sacrum, Benign tumor, imaging.

INTRODUCTION

Giant cell tumors of the bone are rare primitive tumors mainly affecting young adults. They are frequently recurrent, often benign and located, most of the time, at the extremities of the long bones of the limbs. Sacral localization is a rare entity, here, we present a case of solitary GCT of bone in the sacrum that was confirmed by preoperative needle biopsy and postoperative histological examination.

OBSERVATION

23-year-old male patient presented with progressively increasing low back pain radiating to both legs for the past 2 months, associated with tingling and numbness. He had a recent history of constipation and urinary incontinence. He had no spinal surgery or trauma in the past. MRI of lumbosacral spine with and without gadolinium was obtained as screening investigation. MRI revealed a large well defined expansile destructive mass lesion involving the sacrum measuring 86 x 12 x 93 mm (Fig. 1). The mass showed heterogeneous hypo signal intensity on T1 and hyper signal intensity on T2 with curvilinear area of high signal intensity on T1 and T2 (Fig. 2). Few small foci of high intensity on T2 and STIR sequence were seen within the soft tissue mass in keeping with cystic or necrotic components. On post- contrast MR images, it showed heterogeneous enhancement with non-enhancing necrotic areas. The lesion was seen to extend laterally up to the subarticular portion of both sacroiliac joints. Posteriorly it presents a soft tissue extension responsible for a significant narrowing of the sacral canal and for an invasion of the sacral holes. Anteriorly, the mass was extending into the presacral space with no involvement of the rectum and comes into contact with the iliac vessels which remain permeable. As the imaging findings were suggestive of a neoplastic mass of the sacrum, surgical biopsy and histopathological analysis was performed. Microscopy showed a neoplastic lesion composed of evenly dispersed giant cells interspersed with proliferating mononuclear stromal cells. Findings were consistent with giant cell tumor.

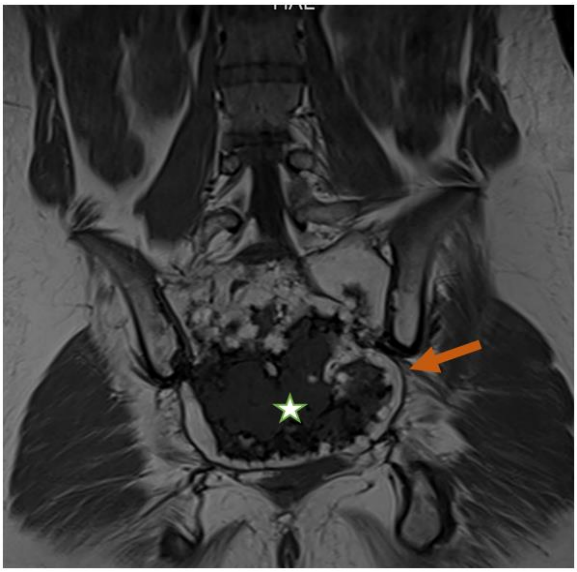

Figure 1: T1 weighted coronal MR images revealed a well-defined expansile destructive mass involving the sacrum (Asterix) with a heterogeneous hypo signal intensity on T1 and peripheric curvilinear area of high signal intensity (Orange arrow)

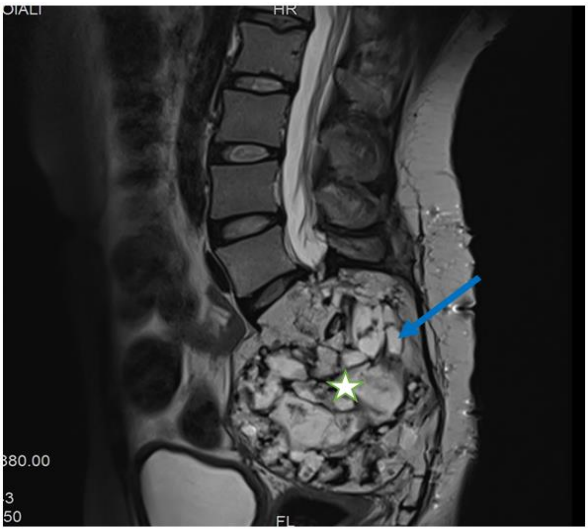

Figure 2: T2 weighted sagittal MR images showing a voluminous mass (Asterix) involving the sacrum with an heterogeneous iso to hyper signal intensity with tissular and cystic components (Blue arrow)

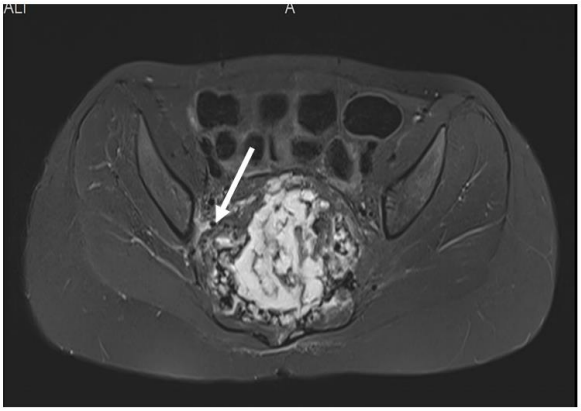

Figure 3: Coronal STIR image showing a hyperintense mass involving the sacrum in the midline with hyperintensity extending into the adjacent muscles and to the sacro-iliac joints (white arrow)

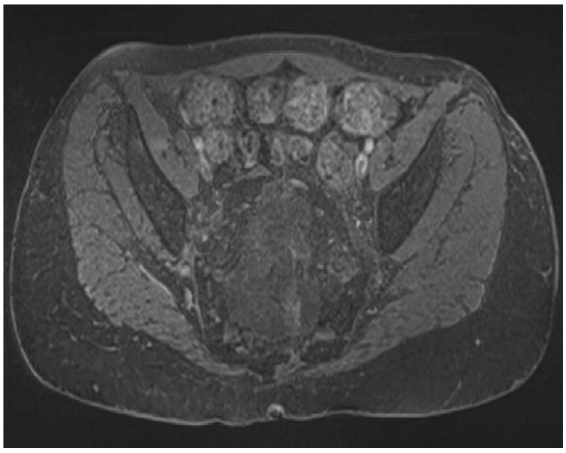

Figure 4: Post contrast axial MR image shows heterogeneous enhancement of the mass

DISCUSSION

Giant Cell Tumor (GCT) is a relatively common skeletal tumor, accounting for 4%–9.5% of all primary osseous neoplasms and 18%–23% of benign bone neoplasms. GCT is typically benign and solitary. However, multiple lesions have been described and 5%–10% of lesions may be malignant [1]. It occurs most commonly in 3rd to 5th decades of life and affects both males and females with slight female preponderance [2]. The most common specific location of GCT is about the distal femur followed by the proximal tibia, distal radius, sacrum (4%–9%) and proximal humerus [1]. MRI is the preferred modality and has superior soft-tissue resolution compared to CT, however, CT may be used to evaluate the matrix of the lesion in certain cases, for detection of pathological fracture, guided biopsy and in those patients in whom MRI is contraindicated.

Sacral lesions are frequently large with destruction of the sacral foramina, but this nonspecific finding is also observed with other large sacral lytic lesions. A sacral GCT commonly involves both sides of the midline, and an extension across the sacroiliac joint is frequent. This feature is infrequent in GCT of long bone as the epiphysis serves as barrier and limits invasion of the joint [3]. CT improves detection of cortical thinning, pathologic fracture, periosteal reaction and degree of osseous expansile remodeling compared with radiography [1]. MRI of a GCT often show heterogeneous signal intensity on all pulse sequences. Generally, the tumor is of low to intermediate signal intensity on T1-weighted images (WI). Interestingly, GCT have low to similar signal intensity to the normal spinal cord on T2-WI. Although this feature is not unique to giant cell tumors of the spine, it is quite helpful in making a differential diagnosis because most other sacral neoplasms (metastases, myeloma, lymphoma and chordoma) show high signal intensity on the long-TR MR images. Evidence of recent hemorrhage may also be apparent with areas of high signal intensity on T1-WI and T2-WI or fluid–fluid levels on the MR images. Cystic areas (similar to those seen in aneurysmal bone cyst) and regions of old hemorrhage with hemosiderin deposits are common GCT shows a variable degree of enhancement on post contrast study [4].

The list of differential diagnoses includes neurysmal bone cyst which presents as a multiloculated, expansile lesion with multiple fluid-fluid levels. Neurogenic tumours include neurofibromas, schwannomas, paragangliomas and chordomas. Target appearance on T2WI is seen in case of neurofibromas while paragangliomas are very vascular and may show haemorrhage. Neurogenic tumors can expand the sacral canal and neural foramina [5]. Chordoma is the most common primary malignant sacral tumor and occurs more commonly in middle-aged to elderly men. It occurs in the midline due to its origin from notochordal remnants. They are typically lytic and expansile, appearing hyperintense on T2 –weighted images due to the presence of mucin. Hemorrhage is not uncommon,

and heterogeneously enhancing soft tissue component is usually present. They are locally aggressive [5]. Chondrosarcomas present as destructive, lytic lesions with endosteal scalloping and extraosseous extension. 'Ring and arc' calcifications representing chondroid matrix may be seen. Ewing's sarcoma is a lytic lesion with large extraosseous component invading the spinal canal [5]. Plasmacytoma occurs in older age. Metastasis in sacrum may occur from primary pelvic malignancy.

The patient is offered radiation therapy as large expansile sacral mass is amenable to complete excision.

CONCLUSION

In conclusion, GCT is rarely encountered in daily clinical practice. It is an expansile, aggressive osteolytic lesion usually with heterogeneous low-to-intermediate signal intensity on the T2 weighted MR images. Cystic changes, sclerotic border and haemosiderin deposition can support the diagnosis. Although it may be difficult to make a correct pre-operative diagnosis, the interpreting radiologist must be aware of the typical imaging features of GCT to provide a complete and accurate differential diagnosis.

REFERENCES

1. Murphey, M. D., Nomikos, G. C., Flemming, D. J., Gannon, F. H., Temple, H. T., & Kransdorf, M. J. (2001). Imaging of giant cell tumor and giant cell reparative granuloma of bone: radiologic-pathologic correlation. *Radiographics*, *21*(5), 1283-1309.
2. Kim, S. H., Hong, S. H., Choi, J. Y., Koh, S. H., Chung, H. W., Choi, J. A., & Kang, H. S. (2003). Imaging findings of sacral tumors. *Journal of the Korean Radiological Society*, *49*(4), 327-336.
3. Kwon, J. W., Chung, H. W., Cho, E. Y., Hong, S. H., Choi, S. H., Yoon, Y. C., & Yi, S. K. (2007). MRI findings of giant cell tumors of the spine. *American Journal of Roentgenology*, *189*(1), 246-250.
4. Thornton, E., Krajewski, K. M., O'regan, K. N., Giardino, A. A., Jagannathan, J. P., & Ramaiya, N. (2012). Imaging features of primary and secondary malignant tumours of the sacrum. *The British journal of radiology*, *85*(1011), 279-284
5. Hain, K. S., Pickhardt, P. J., Lubner, M. G., Menias, C. O., & Bhalla, S. (2013). Presacral masses: multimodality imaging of a multidisciplinary space. *Radiographics*, *33*(4), 1145-1167. (PMID
6. Stephens, M., Gunasekaran, A., Elswick, C., Laryea, J. A., Pait, T. G., & Kazemi, N. (2018). Neurosurgical Management of Sacral Tumors: Review of the Literature and Operative Nuances. *World neurosurgery*, *116*, 362-*369.*