Pelvic Tumor: Report of Two Cases and Literature Review
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Abstract

Chondrosarcoma is a malignant chondrogenic tumour that can arise in two forms, namely primary and secondary chondrosarcoma. It normally arise in middle-aged and elderly patients and most commonly affect the pelvis, proximal femur and scapula. In middle-aged and elderly patients with pelvic bone tumour, metastases from visceral organ must be considered namely thyroid, lung, breast, kidney, colorectal and prostate.

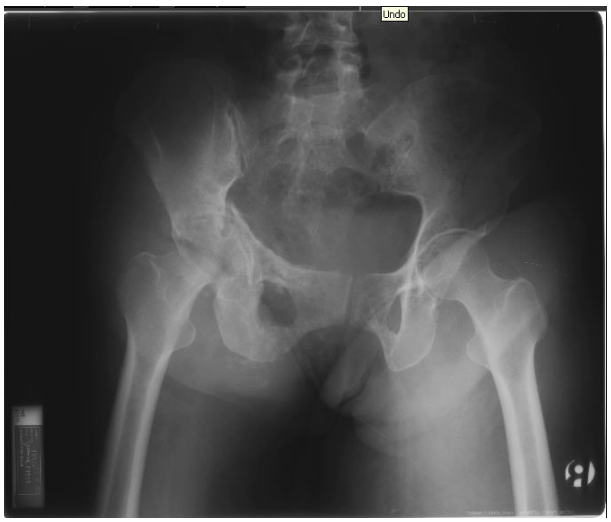
Introduction

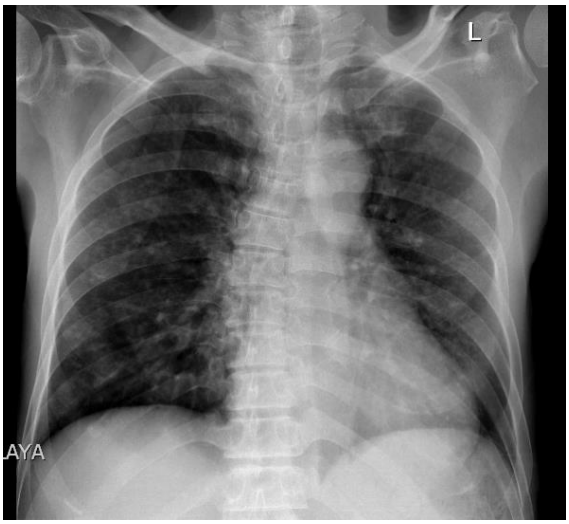
Mesenchymal chondrosarcoma is a variant of chondrosarcoma which presents with biphasic pattern of cartilage. It typically affects younger adult as compared to typical chondrosarcoma and can arise from soft tissues (1/3 of cases) which consists of less than 1% of sarcomas.[1] As prostatic carcinoma is the second most common cancer in men, metastatic spread to the bone is common. Bone spread usually follows the distribution of axial bone namely, skull, thorax, pelvis, spine and proximal femur.[2] We present two cases of pelvic tumour with cervical carcinoma and prostatic adenocarcinoma respectively

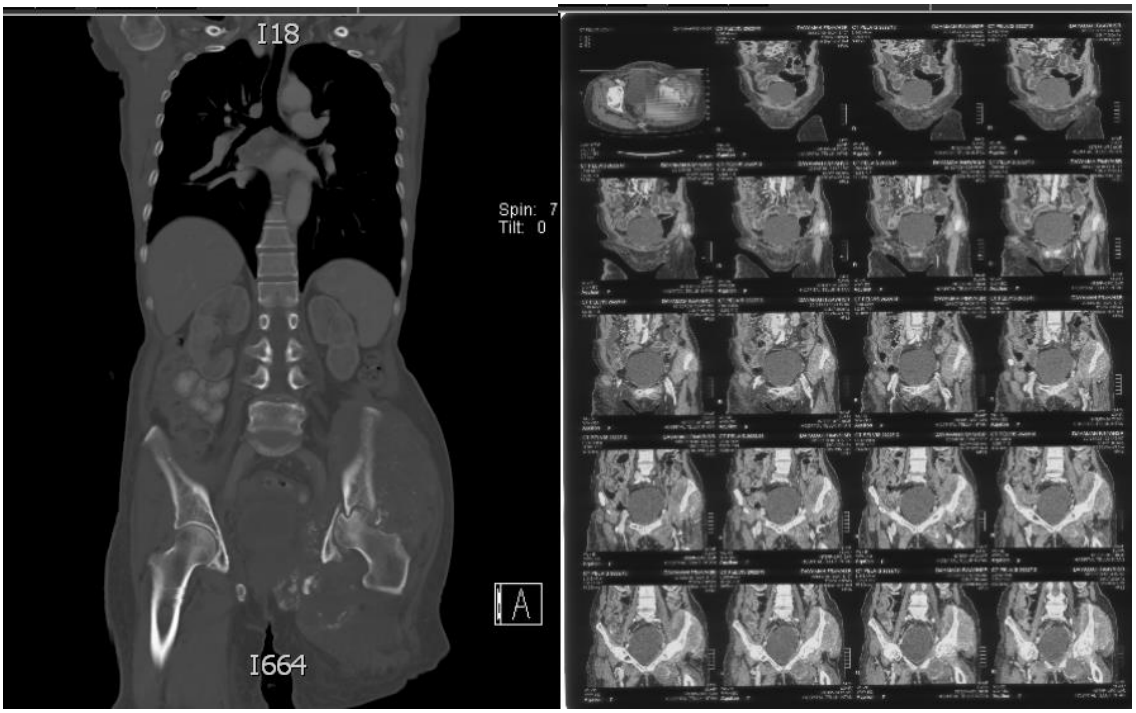
Case 1

A 64 year-old woman with history of cervical carcinoma and resection done in 1991 presented with history of left hip pain for one month. She completed treatment (chemoradiation) and was asymptomatic. She had left hip pain that worsen with movement. It affected her activity of daily living was unable to walk. There was limited

range of movement of left hip due to pain. Physical examination revealed a non-tender mass over the left iliac bone which was fixed to underlying structure but not the skin. There was also global reduction of left hip movement and neurovascular examination was intact. Pelvic radiograph noted cortical thinning and lytic lesion affecting the left the left iliac, ischial and pubic bone. There is soft tissue shadowing seen with stippled calcification. The is also fracture of the acetabulum noted evidence by disruption of iliopectineal line. Chest X-ray noted multiple lesions of bilateral lungs. Computed tomography of thorax, abdomen and pelvis noted large heterogenous mass involving whole pelvic bone with scattered area of calcification. The mass involves left iliacus and gluteus medius. Multiple bilateral lung nodules seen with minimal left pleural effusion. Features suggestive of pelvic chondrosarcoma. Bone scan also noted increased uptake over the left iliac bone. Core needle biopsy taken and histopathological examination noted tumour lobules in the marrow and also in surrounding soft tissue. The tumour lobules are made up of smaller cells in the periphery surrounding areas which are more chondroid in appearance. The tumour cells express vimentin and CD99 but not MNF116 or S100 protein. Left hemipelvectomy was done



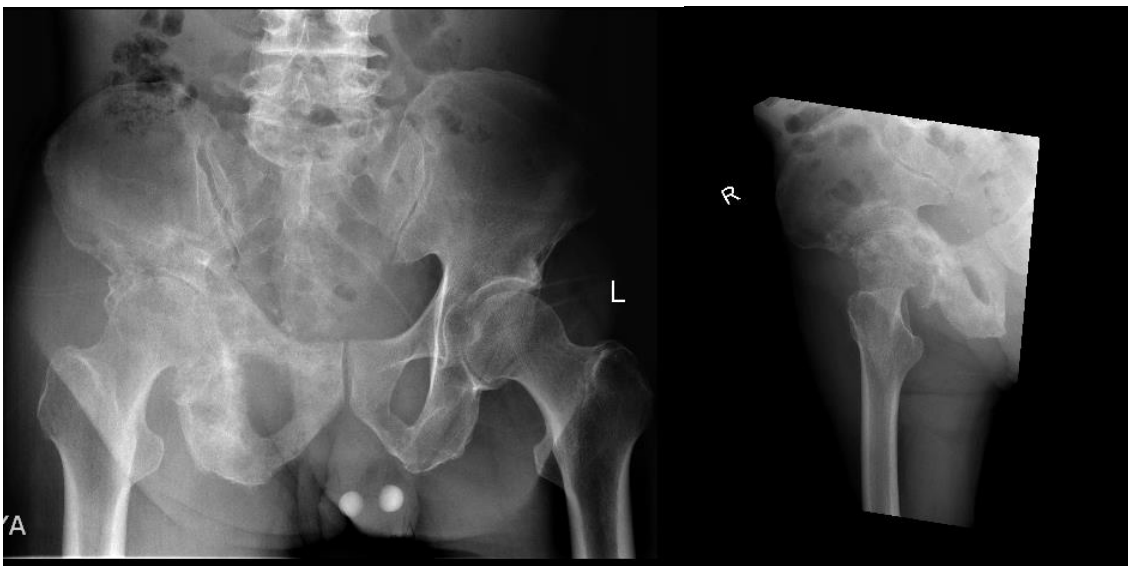


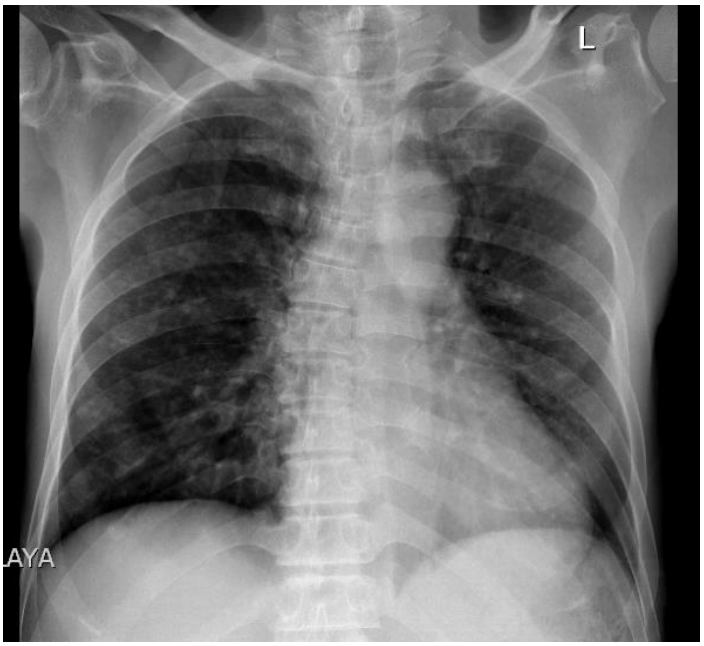


Case 2

69 year-old gentleman known case of hypertension and urinary obstructive symptoms presented with right hip pain. He was unable to walk but able to sit up. There

was reduced right hip movement with minimal pain. Examination revealed global reduction of right hip joint. Hard mass was noted over right iliac bone and neurovascular examination was intact. Pelvic radiograph noted mixed lytic sclerotic mass over the right iliac bone involving the pubic and ischial bone. There is also stippled calcification noted over the soft tissue of right hip. Chest X-ray noted multiple lung lesions. Computed tomography of thorax, abdomen and pelvis noted mixed lytic sclerotic lesions involving the right iliac bone, ischial, pubis and femoral head. Multiple calcification noted in soft tissue around the mass. Magnetic resonance imaging suggestive prostatic carcinoma with extracapsular involvement and bone metastases. Core needle biopsy histopathological examination revealed tumour likely suggestive of metastatic adenocarcinoma. The tumour was positive for CK7 and negative for CK20.

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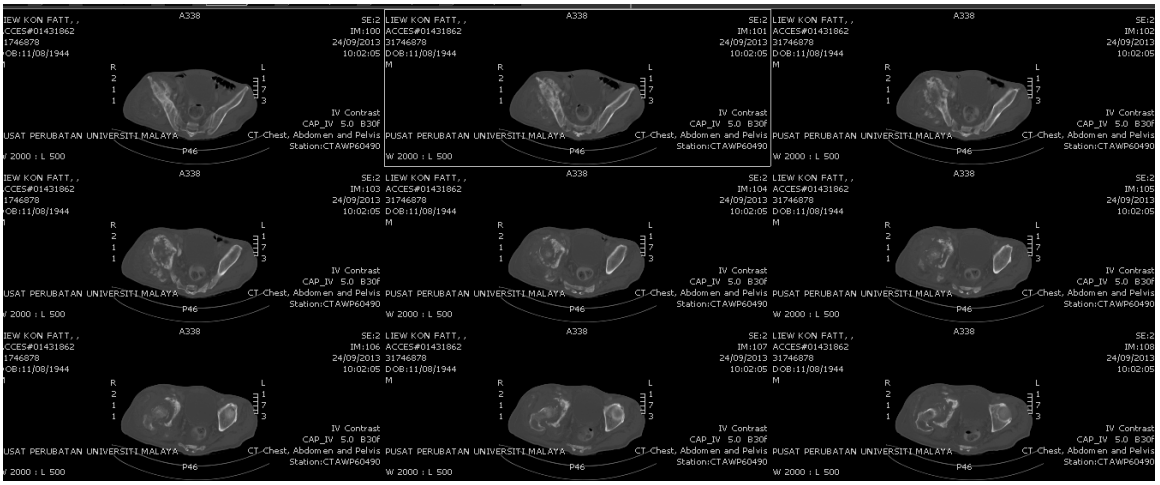
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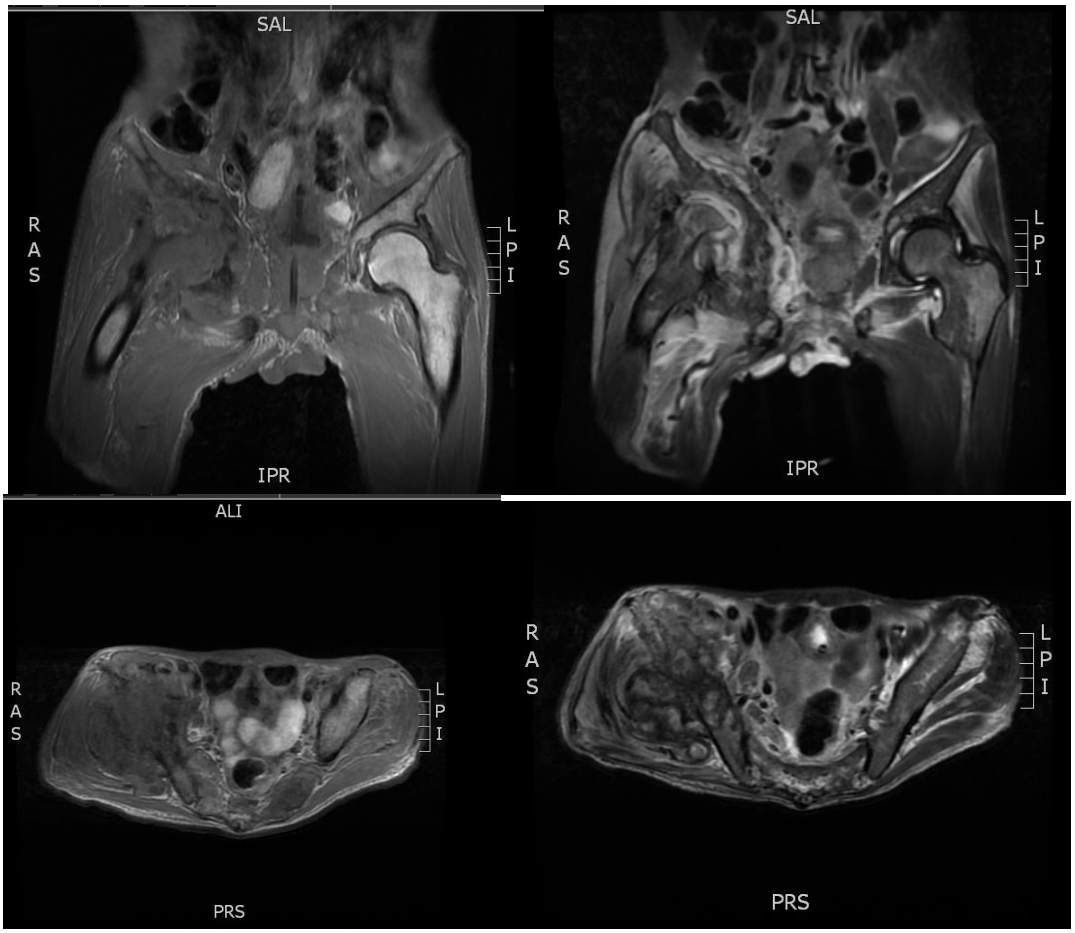

Discussion

Pelvic bone is one of the site of various primary and secondary musculoskeletal tumours. The tumours can be benign or malignant. Common benign tumour of the pelvis in young patient less than 40 years consist of osteochondroma, osteoblastoma, giant cell tumour, fibrous dysplasia, aneurysmal bone cyst and chondroblastoma.[3] In middle-aged and elderly patients, malignant lesions of the pelvis are not uncommon and history, examination, site, radiographic imaging are useful to come out with differential diagnosis.

In the two cases above, previous history of malignancy strongly encourage the diagnoses of metastases as priority. However, other differential diagnoses should also be considered. As the changes in haematopoietic marrow changes with age, metastatic disease, multiple myeloma, Ewing's sarcoma an lymphoma should be considered in elderly patient as they primarily localize to haematopoietic marrow.[4]

Chondrosarcoma can be primary or secondary. Secondary chondrosarcoma can be due to malignant transformation of existing enchondroma or osteochondroma. However, the risk of malignant transformation for isolated lesion is low of about 1%.[5] Malignant transformation is higher in patient with Maffuci's syndrome or Olier's disease. As enchondroma is normally asymptomatic, pain should raise the suspicion for possible chondrosarcoma. Magnetic resonance imaging that shows soft tissue mass, cortical destruction, periosteal reaction, lack of marrow fat within lesion and scalloping more than 2/3 of cortex are suggestive of chondrosarcoma.[6] Ill-defined margin and wide zone of transition is suggestive of high-grade histology.[7] Calcification is a hallmark feature in chondrosarcoma and is related to the malignant potential or degree of the lesion. Scattered and amorphous calcification is said to signify a high-grade tumour.[4]

Metastases to the pelvic bone can be from various visceral organ. Most metastases are osteolytic but sclerotic lesion are common in prostate and breast carcinoma. Like in the case above, lytic lesion are less obvious in plain radiograph but can be seen in computed tomography and magnetic resonance imaging. It is noted that most prostatic metastases to bone is osteoblastic, about 29.1% were osteolytic or mixed.[8] Metastatic bone disease in prostate cancer was noted to be as high as 90%.[9] Bone scan is helpful in detection of metastatic tumour but however is

less useful in osteolytic lesion as well as for assessment of tumour response. This is due to flare phenomenon in which there is increased in uptake in healing metastases up to 6 months following treatment.[10] In view of that, magnetic resonance is increasingly used as well as newer techniques such as FDG-PET scan are showing good lesion detection as well as response assessment in bone metastases from prostate carcinoma. [11] Magnetic resonance imaging is noted to have too sensitivity and specificity of 100% and 88% in detection of bone metastases in patient with prostate cancer.[12] Magnetic resonance imaging is utmost important in patients with prostatic carcinoma who is planned for radical surgery to rule out bone metastases.

Primary treatment of chondrosarcoma of pelvis is resection as chondrosarcoma is not chemosensitive or radiosensitive. Patient in case 1 underwent hemipelvectomy. Reiner J. et. al studied fifty one patients with pelvic chondrosarcoma, 28 patients were alive with mean follow-up of 73 months. The study noted survival was related by tumour stage and surgical margin achieved. Musculoskeletal Tumour Society score was better in patients who underwent continuity resection as compared to internal hemipelvectomy and hemipelvectomy.[13] Pring ME et. al noted that less than a wide surgical excision in pelvic chondrosarcoma results in local recurrence and 17% had distance metastases in patients who underwent either hemipelvectomy or a limb-salvage procedure.[14]

Conclusion

Pelvic bone tumour in elderly is mainly due to malignancy. History, examination and various investigations are important to rule out primary or metastatic lesion. Both primary and metastatic lesion in both cases above can present radiographically similar.

Histopathological examination is helpful in attaining the diagnoses of the pelvic tumour to allow further treatment. Chondrosarcoma in case 1 is likely to be sporadic and not related to history of cervical carcinoma. However, Gupta, G et. al reported a rare case of radiation induced chondrosarcoma in patient with cervical carcinoma. The secondary sarcoma period was noted to vary widely from 5 - 50 years post radiation. [15] Therefore, postulation of a possible radiation induced chondrosarcoma is possible in case 1

References

1. Huvos AG, Rosen G, Dabska M, Marcove RC. Mesenchymal chondrosarcoma: A clinicopathologic analysis of 35 patients with emphasis on treatment. Cancer.1983;51(7):1230–1237

2. Imbriaco M, Larson SM, Yeung HW, Mawlawi OR, Erdi Y, Venkatraman ES, Scher HI. A new parameter for measuring metastatic bone involvement by prostate cancer: the bone scan index.Clin Cancer Res. 1998;4:1765–1772

3. Girish G, Finlay K, Morag Y, Brandon C, Jacobson J, Jamadar D. Imaging review of skeletal tumors of the pelvis--part I: benign tumors of the pelvis. ScientificWorldJournal. 2012 Epub 2012 May 15

4. Gandikota Girish, Karen Finlay, David Fessell, Deepa Pai, Qian Dong, and David Jamadar. Imaging Review of Skeletal Tumors of the Pelvis Malignant Tumors and Tumor Mimics ScientificWorldJournal Published online 2012 April 19

5. Ryzewicz M, Manaster BJ, Naar E, Lindeque B. Low-grade cartilage tumors: diagnosis and treatment. Orthopedics. 2007 Jan;30(1):35-46

6. Brien EW, Mirra JM, Kerr R. Benign and malignant cartilage tumors of bone and joint: their anatomic and theoretical basis with an emphasis on radiology, pathology and clinical biology. I. The intramedullary cartilage tumors. Skeletal Radiol. 1997 Jun;26(6):325-53

7. Llauger J, Palmer J, Amores S, Bagué S, Camins A. Primary tumors of the sacrum: diagnostic imaging. AJR Am J Roentgenol. 2000 Feb;174(2):417-24.

8. Cheville JC, Tindall D, Boelter C, Jenkins R, Lohse CM, Pankratz VS, Sebo TJ, Davis B, Blute ML.

Metastatic prostate carcinoma to bone. Cancer. 2002;95:1028–1036.

9. Bubendorf L, Schopfer A, Wagner U, Sauter G, Moch H, Wili N, Gasser TC, Mihatsch MJ. Metastatic patterns of prostate cancer: an autopsy study of 1589 patients. Hum Path.2000;31:578–583.

10. Madewell JE, Ragsdale BD, Sweet DE.Radiologic and pathologic analysis of solitary bone lesions. Part I: internal margins.Radiol Clin North Am. 1981 Dec;19(4):715-48

11. Messiou C, Cook G, deSouza NM. Imaging metastatic bone disease from carcinoma of the prostate. Br. J. Cancer (2009)

12. Lecouvet FE, Geukens D, Stainier A, Jamar F, Jamart J, d'Othée BJ, Therasse P, Vande Berg B, Tombal B. Magnetic resonance imaging of the axial skeleton for detecting bone metastases in patients with high-risk prostate cancer: diagnostic and cost-effectiveness and comparison with current detection strategies.J Clin Oncol. 2007 Aug 1;25(22):3281-7

13. Reiner J. Wirbel, Michael Schulte, Bernd Maier, Martin Koschnik, and Wolf E. Mutschler. Chondrosarcoma of the Pelvis: Oncologic and Functional Outcome Sarcoma. 2000 December; 4(4): 161–168

14. Pring ME, Weber KL, Unni KK, Sim FH.Chondrosarcoma of the pelvis. A review of sixty-four cases.J Bone Joint Surg Am. 2001 Nov;83-A(11):1630-42

15. Gupta, G.; Hafiz, A.; Gandhi, J. S Radiation-induced chondrosarcomas: A case report with review of literature. Journal of Cancer Research & Therapeutics;Jul-Sep2010, Vol. 6 Issue 3, p394