CASE REPORT

Osteosarcoma arising on a background of Paget's disease report of an unusual case

Asim Qureshi,¹ Khawaja Farhan Zahid,² Sinan Ismail Ibrahim,³ Ikram Burney²

¹Department of Pathology, Sultan Qaboos University Hospital, Muscat, Oman

²Department of Oncology, Sultan Qaboos University Hospital, Muscat, Oman

³Department of Radiology, Sultan Qaboos University Hospital, Muscat, Oman

Correspondence to

Dr Asim Qureshi, asimqureshi32@hotmail.com

SUMMARY

One of the serious complications of Paget's disease (PD) is a significant increase in the risk of developing osteosarcoma. Approximately 1% of the patients with PD develop osteosarcoma. This contributes significantly to the mortality and morbidity of the patients with PD. We present the case of an elderly person, who developed osteosarcoma 1 year after being diagnosed to have PD. The patient had been diagnosed to have lymphoma 8 years prior to the diagnosis of PD. The association between PD and follicular lymphoma is discussed.

BACKGROUND

Paget's disease (PD) of bone is a bone remodelling disorder that affects 1% of general population. PD was first described by Sir James Paget in 1876.¹ Men are affected more frequently than women.^{1 2} Malignant transformation can occur in 0.1–0.95% of patients, and osteosarcoma is the most common secondary tumour, and accounts for more than 80% of sarcomas arising in PD.³

Osteosarcoma occurs mostly in persons with long-standing, polyostotic PD and affects patients in seventh decade. The aetiology of PD remains elusive, and both genetic and environmental factors have been implicated.⁴ Although PD of the bone affects up to 3% of the population over the age of 60, the risk goes up to sevenfold to eightfold, if one of the family members had the disease. An association with prior history of cancer is unknown. We report the case of a 69-year-old man, diagnosed to have transformed diffuse large B-cell lymphoma (t-DLBCL) 8 years before the diagnosis of PD, and developed osteosarcoma 1 year later.

CASE PRESENTATION, INVESTIGATIONS AND TREATMENT

In 2003 an elderly man presented with a 2-month history of fever, generalised abdominal pain and significant weight loss. General physical and systemic examination was unremarkable. There was no family history of bowing or fractures. A CT scan of the chest, abdomen and pelvis showed multiple enlarged paraortic, paracaval, peripancreatic and mesenteric lymph nodes. Laparoscopic biopsy revealed DLBCL with underlying features of follicular lymphoma (t-DLBCL), stage IIB B, with only one adverse prognostic factor (raised lactate dehydrogenase of 854 U/l) on international prognostic index. The patient was treated with eight cycles of combination chemotherapy. The end of treatment scans showed complete response.

Alkaline phosphatase (ALP) returned to within the normal limits (124 U/l). Prechemotherapy ALP level was 746 U/l. The patient remained on continuous follow-up. In 2011, he presented with severe right hip pain for 4 months. Review of x-ray of the spine and the femur suggested a diagnosis of PD, the ALP was found to be elevated to 832 U/l. A few months later, the pain in the right hip joint region increased and review of the x-ray of the hip joint, and a subsequent CT scan suggested the diagnosis of osteosarcoma (figures 1 and 2). An incisional biopsy of right femur soft tissue mass showed round to oval and pleomorphic cells. There were areas of osteoid production in direct continuation to these neoplastic cells. A brisk mitotic activity was seen in these cells along with lace-like osteoid production (figure 3). A section of woven

Figure 1 X-ray showing Paget's disease of the head of femur.

To cite: Qureshi A, Zahid KF, Ibrahim SI, et al. *BMJ Case Reports* Published online: [please include Day Month Year] doi:10.1136/bcr-2012-007770

Figure 2 X-ray showing osteosarcoma of the head of femur.

bone with osteoblastic and osteoclastic activity was also seen. A trichrome stain showed irregular lines of calcification and cement lines (figure 4). Therefore, a diagnosis of osteosarcoma arising on a background of PD was made.

Restaging CT scan showed 1.5 cm new left axillary node along with sub-centimetre nodes in the root of mesentery and right iliac fossa. Biopsy of the node was consistent with a diagnosis of follicular lymphoma (FL) grade 1.

The patient received one more cycle of modified chemotherapy. However, following the first cycle, the patient developed symptomatic congestive heart failure and acute renal failure. This led to a delay in the administration of the second cycle of chemotherapy. The disease progressed rapidly and the patient developed bilateral pulmonary metastasis. Because of persistent pain in the right hip and inability to walk, a palliative resection of the right tumour mass with implant placement was carried out. Microscopic examination showed features similar to the small biopsy. There were areas of pleomorphic spindle cells with intervening osteoid production.

OUTCOME AND FOLLOW-UP

Postoperative course was complicated and the patient succumbed to overwhelming sepsis.

DISCUSSION

Osteosarcoma is the most common primary malignant bone tumour. Risk factors include trauma, previous irradiation, benign bone disease-like fibrous dysplasia and PD. A significant portion of osteosarcoma in adults is associated with PD.⁵ These are osteogenic in origin, consistently arise in sites of Pagetic bone, and may present as metachronous, multifocal lesions.

The overall prognosis of osteosarcoma arising in PD is dismal.^{6 7}

Figure 3 Photomicrograph showing osteosarcoma.

Figure 4 Photomicrograph showing areas representative of Paget's disease.

In this case, the diagnosis of FL antedated the diagnosis of PD by 8 years. Whether there was an association between FL and PD remains speculative. Although the aetiology of PD remains uncertain, antigens of paramyxoviruses, including the measles virus, and the respiratory syncytial virus have been seen in the bone biopsies of patients with PD. Furthermore, the number of patients with PD has decreased considerably over the

last half century, which corresponds with the measles vaccination programme. Also, mutations in the ubiquitin-associated domain of sequestosome 1 have been identified in patients with PD.⁸ Whether there is an association between the mutations and the viruses also remains unclear.

Whereas, there are a few reports of lymphoma developing in bones of patients with known PD,^{9 10} to the best of our

knowledge, there are no reports to the converse. This is the first case report in literature describing the occurrence of PD, several years after the diagnosis lymphoma, coinciding with the progression of FL.

Learning point

Osteosarcoma complicating Paget's disease (PD) is well known; however, osteosarcoma arising on a background of PD in a known case of follicular lymphoma has not been described in the literature.

Competing interests None.

Patient consent Obtained.

Provenance and peer review Not commissioned; externally peer reviewed.

REFERENCES

- 1 Mankin HJ, Hornicek FJ. Paget's sarcoma: a historical and outcome review. *Clin Orthop Relat Res* 2005;438:97–102.
- 2 Paget J. Remarks on osteitis deformans. *Illustr Med News* 1889;2:181–2.
- 3 Packard FA, Steele JD, Kirkbride TS. Osteitis deformans. *Am J Med Sci* 1901;122:552–69.
- 4 Bird CE. Sarcoma complicating Paget's disease of bone: report of 9 cases, 5 with pathological verification. *Arch Surg* 1927;14:1187–208.
- 5 Coley BL, Sharp GS. Paget's disease predisposing factor to osteogenic sarcoma. *Arch Surg* 1931;23:918.
- 6 Pike MM. Paget's disease with associated osteogenic sarcoma: report of three cases. *Arch Surg* 1943;46:750–4.
- 7 Summey TJ, Presley CL. Sarcoma complicating Paget's disease of bone. *Ann Surg* 1946;123:135–53.
- 8 Miner IE. Sarcoma in Paget's disease of bone. *Bull Hosp Joint Dis* 1950;11:27–42.
- 9 Unni KK, Dahlin DC. Premalignant tumors and conditions of bone. *Am J Surg Pathol* 1979;3:47–60.
- 10 Maldague B, Malghem J. Dynamic radiologic patterns of Paget's disease of bone. *Clin Orthop Relat Res* 1987;217:126–51.

Copyright 2013 BMJ Publishing Group. All rights reserved. For permission to reuse any of this content visit <http://group.bmj.com/group/rights-licensing/permissions>.
BMJ Case Report Fellows may re-use this article for personal use and teaching without any further permission.

Become a Fellow of BMJ Case Reports today and you can:

- ▶ Submit as many cases as you like
- ▶ Enjoy fast sympathetic peer review and rapid publication of accepted articles
- ▶ Access all the published articles
- ▶ Re-use any of the published material for personal use and teaching without further permission

For information on Institutional Fellowships contact consortiasales@bmjgroup.com

Visit casereports.bmj.com for more articles like this and to become a Fellow