Sclerosis of lytic metastatic bone lesions during treatment with pamidronate in a patient with adenocarcinoma of unknown primary site

Abstract Pamidronate disodium is a second-generation bisphosphonate, a group of compounds that are being used increasingly to inhibit bone resorption in disorders that are characterized by excessive bone loss such as hypercalcemia of malignancy, osteoporosis, and Paget's disease. The precise mechanisms whereby bisphosphonates inhibit bone resorption are still not completely understood. Pamidronate has previously been reported to induce sclerosis of lytic bone metastases in patients with breast cancer. We have had a similar experience in a patient with multiple bone metastases due to adenocarcinoma of unknown primary site who developed massive consolidation of lytic bone lesions after therapeutic infusions of pamidronate, leading to a satisfactory quality of life.

Key words Bisphosphonates · Metastatic bone tumor · Pamidronate disodium

Case report

A 48-year-old woman complained of pain in the left shoulder girdle and upper arm, beginning August 1990. She was hospitalized on 31 October 1990 and radiological abnormalities of the C6 cervical vertebra were visualized on plain radiographs. Bone metastases of the cervical spine due to an occult carcinoma were diagnosed. On 7 November 1990 she underwent subtotal vertebrectomy of C6 with tumor resection followed by replacement with a ceramic prosthesis. Histology of the excised tissue revealed metastatic papillary adenocarcinoma. She was discharged, symptom-free, on 25 November 1990.

She returned to our hospital on 24 December 1991 due to a recurrence of bone metastases in the cervical spine. Multiple bone metastases were also detected on bone scintigram and plain radiographs in the skull, left seventh rib, left pelvis (Fig. 1 A), and right femur. Treatment with radiation was given as follows, C3–T5, 50 Gy; left hemipelvis, 54 Gy; midshaft of right femur, 56 Gy; skull, 54 Gy. Lytic changes in the pelvis (Fig. 1 B) and cervical vertebrae were progressive during radiation therapy. As part of an on-going phase II clinical trial, she received infusions of 15–45 mg pamidronate disodium (Aredia, Ciba-Geigy, Basel, Switzerland) every 2 weeks to a maximum dose of 810 mg in order to inhibit bone resorption: a first course between June and November 1992 and a second course between March and October 1993. At no time did the patient receive any additional anti-cancer therapy. She experienced considerable pain relief and her appetite gradually improved. Isotopic bone scans and plain radiographs of the cervical and lumbar spine, pelvis, and femur were repeated at approximately 2-monthly intervals. Sclerosis of previously lytic lesions appeared in the cervicothoracic and lumbar spine and pelvis (Fig. 2) as shown in radiographs taken in July 1993. No abnormal serum calcium and phosphate levels were observed during pamidronate treatment.

Fig. 1 A Lytic bone changes were detected at the left acetabulum and both ischia before radiation therapy. B Pelvis radiography, showing the slightly marginal sclerosis of the left acetabulum after radiation therapy

Fig. 2 A Sclerotic bone changes were detected at not only the left pelvis but also right ischium and lumbar spine after the first course of pamidronate infusion. B Plain radiographs showed massive bone formation and sclerotic changes in the pelvis and lumbar spine after the second course of pamidronate infusion

Fig. 3 A CT myelogram of C6, showing lytic bone change on 24 December 1991. B CT myelogram of C6, showing massive bone sclerosis after the second course of pamidronate infusion