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Editorial

Pathophysiology and Management of Bone Metastases

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EDITORIAL NOTE

The aetiology of bone metastases, as well as treatment options and criteria for determining response to therapy, are discussed. In cancer patients, bone metastases are typically one of the first indicators of widespread disease. The initial tumour is found in the breast, prostate, or lungs in the majority of patients. The mechanisms by which several of these medicines reduce pain are unknown, although actions other than a simple tumoricidal effect appear to be essential. There have been few randomised trials comparing therapeutic choices, and the criteria for evaluating response to medication have been ill-defined in general.

A large number of cancer patients have bone metastases, which cause discomfort and reduce their quality of life. Bone metastases are frequently the earliest sign of disseminated disease, with the breast, prostate, and lung being the most common primary locations. Bone metastases have been seen in up to 85% of people dying of these primaries, according to autopsy studies." In roughly 50% of patients with metastatic cancer originating in the breast, prostate, or lung, radiologic investigations lead to an antemortem diagnosis of bone metastases, but only in 3% to 15% of patients with gastrointestinal malignancies. Even though the long-term prognosis is dismal, some people may live for months or even years and require ongoing treatment to manage their symptoms. A variety of experimental models have been effective in researching the poorly understood process by which a primary tumour metastasizes to bone.

Metastasis is not a random process; it entails a series of highly selective processes in which subpopulations with metastatic potential that are already present in the main tumour might travel through the bloodstream to form secondary cancers in the bone. The most common location of pathologic fracture in the leg is the femur. Although radiation alone has shown to be effective, femur fractures are usually treated surgically. The type of treatment (prosthesis, nail, or rod) will be determined by the location of the fracture. Endoprosthetic or total hip replacement, or plate and screw fixation using methylmethacrylate, are used to treat hip fractures. Possible mechanisms that may cause pain from bone metastases include the following:

- Stimulation of nerve endings in the endosteum resulting from the release of chemical agents from the destroyed bone tissue such as prostaglandins, bradykinin, substance P, or histamine
- Stretching of periosteum by the increasing size of the tumour
- Fractures and tumour expansion into nearby nerves and tissues. Only a few of these mechanisms are backed up by hard evidence. The basic mechanism of bone pain from tiny metastases is presumably the stimulation of nerve endings in the endosteum by chemical substances released from the injured bone tissue

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