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MODERN PROBLEMS OF DIAGNOSIS OF PRIMARY AND METASTATIC TUMORS OF LONG BONES COMPLICATED BY PATHOLOGICAL FRACTURE

Asian International University Department
of Preclinical Subjects
Ph.d **Sh.N. Khatamov**

Diagnosis of tumors of long (tubular) bones complicated by a pathological fracture is a complex multi-stage process that requires a comprehensive clinical, instrumental and morphological approach. A pathological fracture is often the first clinical manifestation of both primary malignant bone tumors and metastatic skeletal lesions, which significantly complicates the timely verification of the diagnosis and the choice of optimal therapeutic tactics [1, 2].

The clinical picture is characterized by a prolonged pain syndrome, which, as a rule, precedes the fracture and is progressive. Pain intensifies with exertion, often persists at rest and at night, which distinguishes it from pain of traumatic origin. At the time of a pathological fracture, a sharp increase in pain syndrome, deformation of a segment of the limb, and impaired support and motor function are observed. A significant proportion of patients have a history of previously diagnosed malignant neoplasms of internal organs, which should be alarming about the metastatic nature of the lesion [3].

Radiation diagnostics occupies a key place in the examination algorithm. X-ray of the affected segment in two projections is a primary and mandatory method of examination that allows you to identify the focus of bone tissue destruction, the nature of the lesion (osteolytic, osteoblastic or mixed), the degree of destruction of the cortical layer and the presence of a pathological fracture. However, the possibilities of radiography are limited in assessing the true size of the tumor and the spread of the process beyond the bone [4].

Computed tomography (CT) is used to more accurately assess the architectonics of the bone, determine the extent of the cortical defect, plan surgery and choose a method of fixation or reconstruction. CT is especially informative in diaphyseal lesions of long bones and in complex fracture anatomy [5].

Magnetic resonance imaging (MRI) is the method of choice for local assessment of the tumor process. It allows you to determine the intraosseous spread of the tumor, the involvement of the medullary canal, the soft tissue component, as well as the relationship of the tumor to the neurovascular bundles. These data are of fundamental importance in planning organ-preserving operations and assessing tumor resectability [6].

To stage the disease and identify multiple foci of skeletal lesions, system imaging methods are used. Osteoscintigraphy remains an affordable and sensitive method of screening for bone metastases, but it is characterized by low specificity. In recent years, positron emission tomography combined with CT (PET/CT with 18F-FDG) has become increasingly widely used, which makes it possible to assess the metabolic activity of foci, identify the primary tumor in metastatic lesions, and clarify the stage of the oncological process [7].

Despite the development of radiological diagnostic methods, morphological verification remains a mandatory stage of diagnosis. Tumor biopsy (puncture or open) should be performed in accordance with oncological principles and taking into account the intended surgical access, so as not to impair the possibility of subsequent radical treatment. Histological and immunohistochemical examination makes it possible to determine the nosological form of the tumor, the degree of malignancy, and, in some cases, the molecular genetic characteristics that affect the choice of systemic therapy [8].

An important element of the diagnostic stage is the assessment of the risk of a pathological fracture, especially in the case of an impending (impending) fracture. For this purpose, the

Mirels scale is widely used, based on the analysis of the localization of the lesion, the severity of the pain syndrome, the X-ray type of the focus and its size. Despite certain limitations, this scale remains a practical tool for clinical decision-making [9].

Thus, the diagnosis of long-bone tumors complicated by a pathological fracture should be comprehensive and include clinical evaluation, modern imaging techniques, morphological verification, and fracture risk stratification. This approach provides an informed choice of treatment tactics and contributes to the improvement of functional and oncological results of treatment.

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